Radiocommunication Bureau

FINAL ACTS
WRC-97

WORLD RADIOCOMMUNICATION CONFERENCE (GENEVA, 1997)

International Telecommunication Union

TABLE OF CONTENTS

FINAL ACTS

of the World Radiocommunication Conference

(WRC-97)

Geneva, 1997

Partial revision of the Radio Regulations

Articles

Page

Page

Appendices

Page

Resolutions

Page

Page

Page

Page

Page

Page

Page

Recommendations

Page

FINAL ACTS

of the World Radiocommunication Conference (WRC-97) Geneva, 1997

PREAMBLE

The World Radiocommunication Conference (Geneva, 1995) resolved, by Resolution **718 (WRC-95)**, to recommend to the Council that a world radiocommunication conference be held in Geneva in late 1997 for a period of four weeks.

The Council resolved, at its 1996 session by its Resolution 1086, that the Conference be convened in Geneva from 27 October to 21 November 1997 and established its agenda. The agenda, dates and place were approved by the required majority of the Member States of the Union.

The World Radiocommunication Conference (WRC-97) met in Geneva for the stipulated period and worked on the basis of the agenda approved by the Council. It adopted a revision of the Radio Regulations and Appendices thereto, as contained in the present Final Acts.

In accordance with its agenda, the Conference also took other decisions that it considered necessary or appropriate, including the review and revision of existing Resolutions and Recommendations and the adoption of various new Resolutions and Recommendations as contained in the present Final Acts.

The majority of the provisions revised by the World Radiocommunication Conference (Geneva, 1995 and Geneva, 1997) and contained in the revised Radio Regulations referred to in this Preamble shall apply provisionally as from 1 January 1999; the remaining provisions shall apply as from the special dates of application indicated in Article S59 of the revised Radio Regulations.

The delegates signing the revision of the Radio Regulations contained in the present Final Acts, which is subject to approval by their competent authorities, declare that, should a Member State of the Union make reservations concerning the application of one or more of the provisions of the revised Radio Regulations, no other Member State shall be obliged to observe that provision or those provisions in its relations with that particular Member State.

IN WITNESS WHEREOF, the delegates of the Member States of the International Telecommunication Union named below have, on behalf of their respective competent authorities, signed one copy of the present Final Acts. In case of dispute, the French text shall prevail. This copy shall remain deposited in the archives of the Union. The Secretary-General shall forward one certified true copy to each Member State of the International Telecommunication Union.

Done at Geneva, 21 November 1997

For the Republic of Albania:

BESNIK CUMANI

For the People's Democratic Republic of Algeria:

HAMOUI AHMED

OUHADJ MAHIDDINE

For the Federal Republic of Germany:

EBERHARD GEORGE

For the Principality of Andorra:

JIMÉNEZ-BELTRAN XAVIER

For the Kingdom of Saudi Arabia:

HABEEB K. AL SHANKITI

SAMI S. ALBASHEER

ABDULLAH S. ALMEHAIMEED

IBRAHIM S. ALZAKRI

ABDULAZIZ H. ALTHEIAB

SHAKIR T. AL SHEHRY

IBRAHIM S. ALMORSHED

ABDULRAHMAN A. ALAYYADHI

MOHAMMED A. ALAYAR

MOHAMMED R. AL SHAROUD

ESSA M. ALHARBI

NASSER G. ALHARBI

IBRAHIM A. ALATAR

SALEH M. ALKHAMASH

KHALID M. ALAYED

KHALID O. ALAMRI

For the Argentine Republic:

LUIS ALBERTO ROMERO

JUAN ALBERTO MASCIOTRA

For the Republic of Armenia:

ASHOT HAYRAPETYAN

For Australia:

ROGER SMITH

D. HARTLEY

ALAN ASHMAN

PHILIP MCGILL

For Austria:

G. LETTNER

HELMUT BUCHER

H. WAXENEGGER

For the Commonwealth of the Bahamas:

LEONARD ADDERLEY

JOHN ANDREW M. HALKITIS

For the State of Bahrain:

ABDULLA S. AL-THAWADI

For the People's Republic of Bangladesh:

ABU NASR FARUQ HUSAIN

SHAFIQUL ISLAM

For the Republic of Belarus:

ANATOLY BUDAI

For Belgium:

BAERT FREDDY
DUCHEYNE GINO

For the Republic of Benin:

JACQUES APOLLINAIRE BATONON

For the Federative Republic of Brazil:

RONALDO R. DE ALBUQUERQUE SÁ
AMADEU DE PAULA CASTRO NETO

For Brunei Darussalam:

SAIRUL RHYMIN HJ. C. A. MOHAMED

For the Republic of Bulgaria:

BOJIDAR KOJOUHAROV

For Burkina Faso:

KABA YOUSSOUF
OUEDRAOGO POUSBILO
DIALLO ADAMA ALHASSANE
TRAORE ADAMA

For the Republic of Burundi:

JANVIER SIMBA

For the Republic of Cameroon:

ZOURMBA ABOUBAKAR
ZANGA YENE SIMPLICE
NDEMBA PIAU HENRI
YANKEU JOSEPH
DJOUAKA HENRI
ABENKOU EBAÁ PAULETTE
BIKAI AUGUSTIN LOUIS

For Canada:
ROBERT W. McCAUGHERN
BRUCE A. GRACIE

For the Republic of Cape Verde:
MARGARIDA ÉVORA SAGNÁ

For Chile:
CLAUDIO PEZOA LIZAMA

For the People's Republic of China:
ZHOU DEQIANG
ZHAO XINTONG
HE FUQI

For the Republic of Cyprus:
LAZAROS S. SAVVIDES
GEORGIOS PANAYIOTOU

For the Vatican City State:
EUGENIO MATIS S. J.

For the Republic of Colombia:
CASTRO ROJAS FÉLIX

For the Republic of Korea:
KANG JUNG-HYUP
RHEE MYUNG SOO

For Costa Rica:
CARRILLO-ZURCHER RAFAEL

For the Republic of Côte d'Ivoire:
KOUADIO-GODRIN ROGER

For the Republic of Croatia:

DOMINIK FILIPOVIĆ

For Cuba:

HUGO FERNÁNDEZ MAC BEATH

JUAN CARLOS MIRANDA JIMÉNEZ

For Denmark:

J. LANG NIELSEN

PER CHRISTENSEN

ROBERT LINDGAARD

BENDT WEDERVANG

For the Arab Republic of Egypt:

RAGA ABOUL ELA

For the Republic of El Salvador:

ERIC CASAMIQUELA

For the United Arab Emirates:

YOUSUF ABDULLA AL HASHIMI

SULTAN ALI HASSAN AL MARZOUKI

GEORGE HANNA NEHME

GHASSAN YOUSUF HAWASHEEN

MOHAMED AL TOM SATTI

FAHAD ALI MOUSA AL-NAQBI

AHMAD A. ALMUHAIDEB

DAVID JOHN BOXALL

For Ecuador:

ANGEL LÓPEZ MERINO

For Spain:

ROBERTO SÁNCHEZ SÁNCHEZ

VICENTE RUBIO CARRETÓN

For the Republic of Estonia:

JÜRI JÕEMA

For the United States of America:

JOHN W. BRYANT

For Finland:

KARI KOHO

MARGIT HUHTALA

For France:

JEAN-CLAUDE GUIGUET

FRANÇOIS RANCY

MICHEL POPOT

For the Gabonese Republic:

ESSONGUE SERGE

NKOGHE NDONG LOUIS

For the Republic of the Gambia:

BAKARY K. N'JIE

MOMODOU MAMOUR JAGNE

OMAR P. NDOW

For Ghana:

AGNES YAHAN AGGREY-ORLEANS

For Greece:

POLYCHRONIS IOANNIDIS
DIMITRIOS STRATIGOULAKOS
EVAGGELOS PROIOS
SIGANOS NIKOLAOS

For the Republic of Guinea:

SOW MAMADOU DIOULDE

For the Republic of Hungary:

BÖLCSKEI IMRE

For the Republic of India:

R. N. AGARWAL
P. K. GARG
ASHOK GOLAS
K. S. MOHANAVELU
B. K. DE
A. K. BHATNAGAR

For the Republic of Indonesia:

JONATHAN L. PARAPAK
SOERADI
LUKMAN HUTAGALUNG
HARAPAN TAKARYAWAN

For the Islamic Republic of Iran:

MEHDI TABESHIAN

For Ireland:

PATRICK CAREY
JOHN A. C. BREEN

For Iceland:

GUDMUNDUR ÓLAFSSON
HÖRDUR R. HARDARSON

For the State of Israel:

MOSHE GALILI

For Italy:

GUIDO SALERNO

For Japan:

NOBUTOSHI AKAO

For the Hashemite Kingdom of Jordan:

AHMAD RAWASHDEH

For the Republic of Kazakstan:

AZAMAT SYRGABAYEV

For the Republic of Kenya:

ROGERS K. NG'OTWA
LIVINGSTONE WEBEDEE KIMANI
PAUL JOHN MUNYI
WAMBURU NJOROGE
NGA'NG'A JAMES MUCHINE
JAMES N. IMANENE
JOHN N. KURIA
SAMWEL OUMA OTIENO
MICHAEL MULWA MUNYOKI
WILSON WAINAINA NDUNGU
SAMUEL NGINGA NZAVU

For the State of Kuwait:

SAMI KHALED AL-AMER

For the Lao People's Democratic Republic:

SOMLITH PHOUTHONESY

For the Republic of Latvia:

KĀRLIS BOGENS

KĀRLIS BOGENS JR.

For The Former Yugoslav Republic of Macedonia:

ZORAN JOLEVSKI

For Lebanon:

ABDUL MUNHEM YOUSSEF

For the Socialist People's Libyan Arab Jamahiriya:

ZAKARIA EL HAMMALI

MEHEMED SALEH ALSABEY

For the Principality of Liechtenstein:

FREDERIC ROTH

For the Republic of Lithuania:

NORKŪNAS EUGENIJUS

For Luxembourg:

DAVID C. NETTERVILLE

For Malaysia:

MOHD ZAKI MOHD YUSUFF

For Malawi:

M. M. MAKAWA

M. C. KULUWANI

E. S. HIWA

For the Republic of Mali:

SIMPARA TAHIROU
SAMAKE IDRISSA
CHEICK OUMAR TRAORE

For Malta:

JOSEPH BARTOLO
HENRY MIFSUD
MARTIN SPITERI

For the Kingdom of Morocco:

AHMED TOUMI
MOHAMMED HAMMOUDA

For the Republic of Mauritius:

BHANOODUTT BEEHAREE

For the Islamic Republic of Mauritania:

MOHAMED SALEM OULD JIDOUMOU
BA OUMAR MAMADOU

For Mexico:

SALMA JALIFE VILLALÓN
LEONEL LÓPEZ CELAYA
REYNALDO GONZÁLEZ BUSTAMANTE

For the Federated States of Micronesia:

WILLIAM H. JAHN

For the Republic of Moldova:

TEODOR CICLICCI

For the Principality of Monaco:

PALMARO CHRISTIAN

For Mongolia:

HORLOO OYUNTSETSEG
BANZRAGCH L.

For the Republic of Mozambique:

JOÃO JORGE

For the Republic of Namibia:

JAN HENDRIK KRUGER

For Nepal:

KEDAR JUNG THAPA

For the Republic of the Niger:

MALAM BOUKAR ABDOULAYE

For the Federal Republic of Nigeria:

KUNDERA MICHAEL MUNKAILU
DRAMBI PIUS
IGWE JOSEPH IKEDICHUKWU
CHUKWUDI UDODILIM MICHAEL OSAMOR
UCHEAGA SAMUEL CHIBUZO NGOZI
OLADIRAN TUNDE OLUWATOYIN
OKONYE PATRICK V. I.
IBOK SUNDAY WILLIAM

For Norway:

KNUT BRYN
ERIK H. JØROL
TORE ØVENSEN
TORD S. FREDRIKSEN

For New Zealand:

G. HUGH RAILTON
DAVID JOHN JENNER
BRUCE R. EMIRALI
MAX MORISON
ALAN JAMIESON
IAN GOODWIN

For the Sultanate of Oman:

SALIM BIN ALI AL ABDISSALAM

For the Republic of Uganda:

EDWARD BYEKWASO MUBIRU SSALI
SIMON BUGABA
JOHN KAGORO TUSUBIRA

For the Republic of Uzbekistan:

KONOVALOV KONSTANTIN

For the Islamic Republic of Pakistan:

MIAN MUHAMMAD JAVED
NAVEED IQBAL

For the Republic of Panama:

EDMUNDO G. DE GRACIA

For Papua New Guinea:

PHILLIP AEAVA-AIA
ARUA TARAVATU
VLADE DONCEVSKI
JOHN CHOLAI

For the Republic of Paraguay:

ELADIO LOIZAGA
ANGEL BARBOZA

For the Kingdom of the Netherlands:

J. F. BROERE

For the Republic of the Philippines:

FIDELO Q. DUMLAO

For the Republic of Poland:

WOJCIECH HAŁKA
KRZYSZTOF SŁOMCZYŃSKI

For Portugal:

GONÇALO DE SANTA CLARA GOMES

For the State of Qatar:

ABDULWAHED FAKHROO

For the Syrian Arab Republic:

MOHAMED MOUAFAC AL AWA
MICHEL BARA
MARWAN HAMOUDA

For the Kyrgyz Republic :

NOURMATOV BAIYSH

For the Democratic People's Republic of Korea:

JONG THAE RIM

For the Slovak Republic:

MILAN LUKNÁR

For the Czech Republic:

DAVID STÁDNÍK

For Romania:

SORIN PANTÍS

For the United Kingdom of Great Britain and Northern Ireland:

M. GODDARD

M. A. JOHNSON

G. E. DOLBY

K. C. WHITTINGHAM

For the Russian Federation:

KROUPNOV ALEXANDRE

For the Republic of San Marino:

GRANDONI IVO

GIRI MICHELE

For the Republic of Senegal:

ABSA CLAUDE DIALLO

ABDOULAYE CISSE

CHEIKH TIDIANE NDIONGUE

PAPE GORGUI TOURE

OUSMANE KEBE

For the Republic of Singapore:

LIM CHOON SAI

LIM YUK MIN

ANIL NIHALANI

YEO SIEW NGEE

For the Republic of Slovenia:

TRDIN MARJAN

For the Republic of the Sudan:

MOHD OMAR MOHD IBRAHIM

For the Democratic Socialist Republic of Sri Lanka:

EDIRIWEERA S. S.
DISSANAYAKE R. C. R.
ABEYRATNE H. M. G. P. U. A.
VISHAKHA K. S. M.

For the Republic of South Africa:

JACOB S. SELEBI
PIETER N. LOCHNER
LABIUS M. LESIBU
S. LINDEN PETZER
ZUKIE MAKALIMA
STEFANIE KILIAN
SHANE M. HIBBARD
DEEPAK HARIE
ALF EADY
L. SHOPE-MAFOLE

For Sweden:

ANDERS FREDERICH
JAN-ERIK LEJERKRANS

For the Confederation of Switzerland:

PETER PAULI

For the Republic of Suriname:

L. C. JOHANNS

For the United Republic of Tanzania:

ELIZABETH NZAGI
ADOLAR BARNABAS MAPUNDA
E. T. K. MANGE

For the Republic of Chad:

GUIRDONAN MOGALBAYE

For Thailand:

SETHAPORN CUSRIPITUCK
WIWAT SUTTIPAK

For the Togolese Republic:

AMEDODJI KOMI

For the Kingdom of Tonga:

TANIELA H. TUFUI

For Tunisia:

BETTAIEB BECHIR

For Turkey:

FATIH MEHMET YURDAL

For Ukraine:

ZHENZHERA VICTOR
MICHAL'CHUK IVAN

For the Republic of Venezuela:

JHONNY ARRIOJA
YBETH MAITA

For the Socialist Republic of Viet Nam:

LUU VAN LUONG

For the Republic of Yemen:

ABDULKADER IBRAHIM

For the Republic of Zambia:

ELIAS CHILESHE
ROBBYSTAR NSHUMFWA
EMMANUEL CHIBWE

For the Republic of Zimbabwe:

GIDEON MAGODO
DZIMBANHETE MATAVIRE
OBERT MUGANYURA
ALEC M. MASOAPATALI

FINAL PROTOCOL

List of countries in alphabetical order giving the number(s) of their declarations:

Albania (Republic of) (18)

Algeria (People's Democratic Republic of) (10, 30)

Armenia (Republic of) (64)

Australia (88)

Austria (19)

Bahamas (Commonwealth of the) (3)

Bahrain (State of) (6, 10)

Bangladesh (People's Republic of) (9)

Belarus (Republic of) (64)

Belgium (19)

Brazil (Federative Republic of) (58)

Brunei Darussalam (57)

Bulgaria (Republic of) (85)

Burkina Faso (72)

Cameroon (Republic of) (11)

Canada (45)

China (People's Republic of) (43, 77)

Colombia (Republic of) (54)

Costa Rica (79)

Cuba (47)

DECLARATIONS*

At the time of signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the undersigned delegates take note of the following declarations made by signatory delegations:

No. 1

Original: English

For Thailand:

The delegation of Thailand to the World Radiocommunication Conference (Geneva, 1997) reserves for its Government the right to take any action it deems necessary to safeguard its interests should any Member or Members of the International Telecommunication Union fail, in any way, to comply with the Final Acts of this Conference and the Annexes thereto or should any of the declarations by other Members jeopardize its telecommunication services or infringe its national sovereignty.

No. 2

Original: English

For the Republic of Mauritius:

The delegation of the Republic of Mauritius reserves for its Administration the right to take any action it may consider necessary to safeguard its interests, should certain Members of the Union fail to observe the provisions of the current Radio Regulations or should reservations entered by other Members jeopardize the operation of its radiocommunication services.

---

* *Note by the Secretary-General:* The texts of the Final Protocol are shown in the chronological order of their deposit.

No. 3

Original: English

For the Commonwealth of the Bahamas:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Commonwealth of the Bahamas reserves for its Government the right to take any measure it might deem necessary to safeguard its interest if another country should in any way fail to respect the conditions specified in the Final Acts or if the reservation made by any country should be prejudicial to the operation of the radiocommunication services of the Commonwealth of the Bahamas.

The delegation of the Commonwealth of the Bahamas further reserves for its Government the right to make any statement or declaration when depositing its instrument of its consent to be bound by the revision of the Radio Regulations by the World Radiocommunication Conference (Geneva, 1997).

No. 4

Original: English

For the Socialist People's Libyan Arab Jamahiriya:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Great Socialist People's Libyan Arab Jamahiriya reserves for its country the right to take any measures it considers necessary to safeguard its interests. This reservation concerns, in particular, such harmful interference as may be caused to its fixed and mobile services by other networks in the bands 4-10 GHz, and sub-bands 1 980-2 010 MHz and 2 170-2 200 MHz.

No. 5

Original: English

For the Syrian Arab Republic:

The delegation of the Syrian Arab Republic reserves for its Administration the right to take any action it considers necessary to protect its interests if Members of the Union should fail in any way whatever to comply with the provisions of the Radio Regulations and in particular Resolution **24 (WRC-95)**, as regards its intention to adopt provisionally

the revised Radio Regulations by a world radiocommunication conference or to be bound by such revisions, or if reservations made by other Members should jeopardize the efficient operation of its radiocommunication services.

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the Syrian delegation reserves for its government the right to take any action it considers necessary to protect its interests, in particular its sovereign right to protect the operation of its radiocommunication stations from harmful interference.

This reservation is justified among other things by its doubt regarding certain decisions adopted by this Conference as regards ensuring the rational, equitable, efficient and economic use of part of the radio-frequency spectrum by radiocommunication services including those using the geostationary-satellite orbit, in particular those relevant to the planning of Appendices **30** and **30A**.

The Syrian delegation also states that:

In the bands 10.7-11.7 GHz, 11.7-12.5 GHz, 12.5-12.75 GHz, 12.75-13.25 GHz, 13.75-14.5 GHz, 17.3-18.1 GHz and 17.8-18.6 GHz, stations of the non-geostationary fixed-satellite service shall not cause harmful interference to or claim protection from existing or planned stations of the fixed and mobile services or geostationary fixed-satellite services, or existing and planned stations of the broad-casting-satellite service, in accordance with the provisions of Appendices **30**, **30A** and **30B**. In addition, emissions from the non-geostationary fixed-satellite service shall not cover its national territories without its agreement.

No. 6

Original: English

For the Kingdom of Saudi Arabia, the State of Bahrain, the United Arab Emirates, the State of Kuwait, the Sultanate of Oman and the State of Qatar:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegations of the Administrations of the Cooperation Council for the Arab States of the Gulf (GCC) to this Conference, on behalf of their Governments, reserve the right to take any action they deem necessary to safeguard their interests should they be affected or should any Member fail to comply with the provisions of the Convention or its Annexes, or should reservations by any other country jeopardize their telecommunication services.

No. 7

Original: French

For the Gabonese Republic:

The delegation of the Gabonese Republic reserves for its Government the right to take such action as it may deem necessary to safeguard its interests should other Members fail to comply with the provisions of the Final Acts of the World Radiocommunication Conference (Geneva, 1997), or should reservations entered by other countries jeopardize the efficient operation of its telecommunication services.

No. 8

Original: English

For Malaysia:

The delegation of Malaysia to the World Radiocommunication Conference (Geneva, 1997):

1 reserves the right of its Government to take any action and preservation measures it deems necessary to safeguard its national interests should the Final Acts drawn up in the World Radiocommunication Conference (Geneva, 1997) directly or indirectly affect its sovereignty or be in contravention with the Constitution, Laws and Regulations of Malaysia as well as with the rights of Malaysia which exist and may result from any principles of international law or should reservations by any Member of the Union jeopardize Malaysia's telecommunication and radiocommunication services or lead to an increase in its contributory share towards defraying the expenses of the Union;

2 further reserves the rights of its Government to make such reservations as may be necessary up to and including the time of ratification of the Final Acts of the World Radiocommunication Conferences (Geneva, 1995 and 1997).

No. 9

Original: English

For the People's Republic of Bangladesh:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the Bangladesh delegation reserves for its Government the right to take such measures as necessary to safeguard its interests if any other country should in any

way fail to respect the conditions specified in the Final Acts, or if the reservations made by any other country become prejudicial or detrimental to radiocommunication services in Bangladesh.

In addition, Bangladesh reserves the right to make appropriate specific reservations prior to ratification of the Final Acts.

No. 10

Original: English

For the People's Democratic Republic of Algeria, the Kingdom of Saudi Arabia, the State of Bahrain, the United Arab Emirates, the Islamic Republic of Iran, the State of Kuwait, Lebanon, the Socialist People's Libyan Arab Jamahiriya, the Islamic Republic of Pakistan, the Syrian Arab Republic and the Republic of Yemen:

The above-mentioned delegations to the World Radiocommunication Conference (Geneva, 1997), declare that the signature and possible ratification by their respective Governments of the Final Acts of this Conference, should not be valid for the ITU Member under the name "Israel", and in no way whatsoever imply its recognition by these Governments.

No. 11

Original: French

For the Republic of Cameroon:

The delegation of the Republic of Cameroon to the World Radiocommunication Conference (Geneva, 1997), reserves for its Government the right to take any action it considers necessary to protect its interests should a Member of the Union fail to comply with the provisions of these Final Acts or should declarations and reservations made by others jeopardize the efficient operation of its radiocommunication services.

The delegation of the Republic of Cameroon further reserves for its Government the right, as and when necessary, to make additional reservations to these Final Acts.

No. 12

Original: French

For the Republic of Senegal:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Republic of Senegal reserves for its Government the right:

1 to take such action as it may deem necessary to safeguard the interests of Senegal and to protect the operation of telecommunication services in Senegal in the event that the present or future efficient operation of those services might be jeopardized by:

– decisions of this Conference (WRC-97);

– reservations entered by other delegations in the Final Acts of this Conference (WRC-97);

2 to take any action in conformity with the Constitution and the laws of the Republic of Senegal.

No. 13

Original: French

For the Togolese Republic:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Togolese Republic reserves for its Government the right to take any action it considers necessary for safeguarding its interests should decisions taken at this Conference, reservations expressed by other Members of the Union with regard to these Final Acts or non-compliance with the provisions of the revised Radio Regulations jeopardize the efficient operation of its telecommunication services.

No. 14

Original: English

For the Republic of Indonesia:

The delegation of the Republic of Indonesia to the World Radiocommunication Conference (Geneva, 1997):

1 reserves the right of its Government to take any action and preservation measures it deems necessary to safeguard its national interest should the Final Acts

drawn up in the World Radiocommunication Conference (Geneva, 1997) directly or indirectly affect its sovereignty or be in contravention with the Constitution, Laws and Regulations of the Republic of Indonesia as well as with the rights of the Republic of Indonesia which exist and may result from any principles of international law. In this regard, the Government of the Republic of Indonesia will recognize the legitimate interests of other countries with a view to improving the use of the geostationary and/or non-geostationary-satellite orbit, broadcasting-satellite and HF broadcasting services and other radiocommunication services for the benefit of mankind;

2 further reserves the right of its Government to take any action and preservation measures it deems necessary to safeguard its national interests should any administration in any way fail to comply with the provision and requirements in the Final Acts of the World Radiocommunication Conference (Geneva, 1997) or should the consequences of reservations by any administration jeopardize the rights of the Republic of Indonesia under the Final Acts.

No. 15

Original: English

For the Republic of Suriname:

The delegation of the Republic of Suriname declares that its Government reserves the right to take such action as it may consider necessary to protect its interests, should a Member fail in any way to observe the provisions of the Constitution and Convention of the International Telecommunication Union (Geneva, 1992), or should the reservations made by such Member jeopardize its telecommunication services or lead to an increase in Suriname's share in defraying the expenses of the Union.

No. 16

Original: English

For Ghana:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of Ghana reserves for its Government the right to take any action it considers appropriate to safeguard its legitimate interests, should these interests be deemed to be in jeopardy through the failure of any Member State of the

International Telecommunication Union to comply with the provisions of these Final Acts. The Government of Ghana further reserves the right to express reservations on any provisions of the Final Acts deemed to be incompatible with the Constitution, laws and regulations of the country.

No. 17

Original: French

For Tunisia:

In signing the Final Acts, the Tunisian delegation expresses reservations should the texts adopted by this Conference within a very limited time give rise to interpretations which are not in conformity with the fundamental principles of ITU guaranteeing equitable treatment for all Members of the Union. By this Declaration, the Tunisian delegation reserves for its Government the right to take any action it considers necessary to safeguard its interests and protect its radiocommunication services.

No. 18

Original: English

For the Republic of Albania:

The delegation of Albania to the World Radiocommunication Conference (Geneva, 1997) reserves for its Government the right to take any action it deems necessary to safeguard its interest should any Member or Members of the International Telecommunication Union fail in any way to comply with or apply the provisions of these Final Acts of this Conference and the Annexes thereto, or should any acts of other entities or third parties affects its national sovereignty.

No. 19

Original: French/ English/ Spanish

For the Federal Republic of Germany, Austria, Belgium, Denmark, Spain, Finland, France, Greece, Ireland, Italy, Luxembourg, the Kingdom of the Netherlands, Portugal, the United Kingdom of Great Britain and Northern Ireland and Sweden:

The delegations of the Member States of the European Union declare that the Member States of the European Union will apply the revision of the Radio Regulations adopted at this Conference in accordance with their obligations under the Treaty establishing the European Economic Community.

No. 20

Original: Spanish

For Spain:

The Spanish delegation reserves for the Kingdom of Spain the right, in accordance with the Vienna Convention on the Law of Treaties of 23 May 1969, to express reservations to the Final Acts adopted by this Conference until such time as, in accordance with the provisions of Article 54 of the Constitution of the International Telecommunication Union, it consents to be bound by the revision to the Radio Regulations contained in those Final Acts.

No. 21

Original: English

For the Republic of Moldova:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the Republic of Moldova delegation reserves for its Government the right to take such measures as it might deem necessary to safeguard its interests if any other country should in any way fail to respect the conditions specified in the Final Acts or if the reservations made by any country should be prejudicial or detrimental to radiocommunication services in the Republic of Moldova.

No. 22

Original: French

For the Republic of the Niger:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997) the delegation of Niger reserves for its Government the right to take any action it considers necessary to safeguard its interests should any Members fail to comply with the provisions of the Final Acts adopted by the Conference or should reservations entered by other Members of the Union give rise to harmful interference to its radiocommunication services.

No. 23

Original: English

For the Republic of South Africa:

The delegation of the Republic of South Africa declares that it reserves for its Government the right to take any action which it may deem necessary to safeguard its interests should any Member State fail to comply with the provisions of the Constitution and Convention of the International Telecommunication Union (Geneva, 1992), its Annexes and the Protocols attached thereto and the Radio Regulations. The same reservation is made for the Government in regards to the Final Acts of the World Radiocommunication Conferences (Geneva, 1995 and 1997), and in regards to any reservations or actions by other Member States which jeopardize its telecommunication services.

Furthermore, the delegation of South Africa reserves for its Government the right to make any statements or reservations when depositing its instruments of ratification of the Final Acts of the World Radiocommunication Conference (Geneva, 1997).

No. 24

Original: English

For the Republic of Hungary:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Republic of Hungary reserves the right for its Government to take such action as it may consider necessary to safeguard its interests should any Member States of the Union fail in any way to observe or comply with the provisions of these Final Acts or should reservations by other countries jeopardize the proper operation of its radiocommunication services.

No. 25

Original: English

For the Republic of Slovenia:

The delegation of the Republic of Slovenia to the World Radiocommunication Conference (Geneva, 1997), declares the following reservation at signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997) and reserves the right for its Government to take such action as it may consider necessary to safeguard its interests should any Member State of the Union fail in any way to observe or comply with the provisions of these Final Acts or should reservations by other countries jeopardize the proper operation of its radiocommunication services.

No. 26

Original: English

For Greece:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997) the delegation of Greece declares:

1 that it reserves for its Government the right:

a) to take any action consistent with its national and international law that it may consider or deem necessary or useful to protect and safeguard its sovereign and inalienable rights and legitimate interests, should any Member State of the International Telecommunication Union fail in any way to comply with or apply the provisions of these Final Acts, which include the Radio Regulations and the Resolutions of the Conference, or should the acts of other entities or third parties affect its national sovereignty;

b) to make, under the Vienna Convention on the Law of Treaties of 1969, reservations to the above-mentioned Final Acts at any time it considers proper between the date of signature and the date of their ratification or approval and not to be bound by any provision of these Final Acts or of the Constitution and the Convention of the International Telecommunication Union restricting its sovereign right to make reservations;

2 that the assignments contained in the Plans of Appendices **30 (S30)** and **30A (S30A)**, as revised in these Final Acts and as reflected in the relevant documents of this Conference, compromise the previous assignments of the Administration of Greece and consequently, if the situation is not improved through the procedure foreseen after the Conference, so as to keep balance with other assignments, the Administration of Greece may consider itself not to be bound by the above-mentioned Plans and by those provisions of these Final Acts, and especially of the respective Appendices that it may deem necessary to protect and safeguard its rights and legitimate interests on this matter;

3 that it is fully established that the term "country", used in the provisions of these Final Acts and in any other instrument or act of the International Telecommunication Union with regard to its Members and their rights and obligations, is regarded as being synonymous in all respects with the term "sovereign State" as legally constituted and internationally recognized.

No. 27

Original: English

For the Democratic People's Republic of Korea:

The delegation of the Democratic People's Republic of Korea to the World Radiocommunication Conference (Geneva, 1997), in signing the Final Acts of the Conference, strongly insists that the broadcasting-satellite service to other countries should be conducted only with the consent of the country concerned.

The delegation also requests that the rainfall intensity put forward by the Democratic People's Republic of Korea be used, as it is in planning the broadcasting-satellite service.

The delegation declares that the Democratic People's Republic of Korea reserves the right to take any action it deems necessary to protect its interests if any other country does not observe relevant provisions of the Final Acts and if reservations made by other countries hinder proper operation of its broadcast and telecommunication service or jeopardize its sovereignty.

No. 28

Original: Spanish

For Spain:

Spain has always opposed and will continue to oppose any attempt to change the status of Gibraltar, a dependent territory of the United Kingdom which is the State responsible for all aspects of its international relations. Spain cannot tolerate the use of technical arguments or reasons, or other means, to promote the recognition, whether explicit or implicit, of such supposed change of status, nor can it accept, in any way, the recognition of the Colony of Gibraltar as a separate entity independent from the metropolitan country in the international community.

The terminology used in the United Kingdom for Gibraltar is “Crown Colony” and “Dependent Territory”. In compliance with Chapter XI of the Charter of the United Nations, the United Kingdom registered Gibraltar in 1946 as a “non-self-governing territory”; it is included in the list of territories to be decolonized and has been the subject of numerous resolutions. For the European Union it is a European territory whose external relations are assumed by the United Kingdom (Art. 227.4).

The presence of a representative of the local government of the Colony as International Frequency Coordinator in the World Radiocommunication Conference (WRC-97) is by no means a technical or administrative issue and is a political matter relating directly to the dispute between Spain and the United Kingdom concerning the Colony. The responsibility for the international coordination of frequencies for its Colony devolves exclusively on the international coordinating authority of the metropolitan country which alone is entitled to engage in such negotiations.

The United Kingdom, on the pretext of the internal organization of its services, has on several occasions attempted to introduce a representative of the local government of Gibraltar with an independent voice in the bilateral negotiations on telecommunications with Spain. That objective has always been rejected.

Although there is no objection to allowing the attendance at international meetings and conferences of the person or persons responsible locally in Gibraltar for telecommunication issues, such person or persons should on no account be permitted to be officially accredited as the representative of the “Government of Gibraltar” and still less be given functions which imply a capacity for international relations.

No. 29

Original: English

For Malta:

The delegation of Malta reserves for its Government the right to take such action as it may consider necessary to safeguard its interests should any Member not share in defraying the expenses of the Union, or should any Member fail in any other way to comply with the requirements of the Constitution and the Convention of the International Telecommunication Union (Geneva, 1992), or the Annexes or Protocol attached thereto, or should reservations made by other countries jeopardize the operation of its telecommunication services or entail an increase in its contributory share in defraying the expenditure of the Union.

No. 30

Original: French

For the People's Democratic Republic of Algeria:

In signing the Final Acts, the delegation of the People's Democratic Republic of Algeria expresses reservations should the number and complexity of the texts considered and adopted by this Conference within a very limited time give rise to interpretations which are not in conformity with the fundamental principles of the Union guaranteeing equitable treatment of the rights of the Members of the Union.

By this reservation, the delegation of the People's Democratic Republic of Algeria formally declares that it does not consider itself bound by all the provisions adopted under the conditions described above, and in particular by those that were the subject of declarations on its part during the Plenary Meetings.

No. 31

Original: English

For New Zealand:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the New Zealand delegation reserves for its Government the right to take such measures as it might deem necessary to safeguard its interests if any other country should in any way fail to respect the conditions specified in the Final Acts or if the reservations made by any other country should be prejudicial or detrimental to radiocommunication services in New Zealand.

In addition, New Zealand reserves the right to make appropriate specific reservations and statements prior to ratification of the Final Acts.

No. 32

Original: English

For the Republic of Yemen:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the Yemen Republic delegation declares on behalf of its Government that:

1 it reserves for its Government the right to take any action it may deem necessary consistent with its national law and with international law, to safeguard its national interests, should other Members fail to comply with the Constitution or the Convention of the International Telecommunication Union (Geneva, 1992), or should reservations by representations of other States jeopardize its telecommunications services or its full sovereign rights;

2 in view of the possibility of harmful interference from the operation of non-GSO MSS including their feeder links and non-GSO FSS in some frequency bands newly allocated to them by the Conference to the use of these bands, the Yemeni delegation reserves for its Government the right to continue to use the existing and planned services in these bands free from harmful interference.

No. 33

Original: English

For Nepal:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Kingdom of Nepal reserves the right for its Government to take such action as it may consider necessary to safeguard its interests should any Member States of the ITU fail in any way to observe or comply with the provisions of these Final Acts, or should reservations by other countries jeopardize its telecommunication services.

No. 34

Original: English

For the Republic of Namibia:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Republic of Namibia reserves for its Government the right to take such actions, as may be considered necessary, to safeguard its interests should any Resolutions and Recommendations adopted by the above-mentioned Conference jeopardize in any way the radiocommunication services of the Republic of Namibia.

No. 35

Original: English

For the Kingdom of Tonga:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Kingdom of Tonga:

1 Declares that it reserves for its Government the right:

a) to take any measures it may deem necessary, in conformity with its domestic law and with international law, to safeguard its national interests should any other Member fail to comply with the provisions of the Radio Regulations or any other documents contained in the Final Acts of the Conference, or should the Acts or reservations by representatives of other States affect its national sovereignty or its national telecommunications;

b) to make, under the Vienna Convention on the Law of Treaties of 1969, reservations to the above-mentioned Final Acts at any time it considers proper between the date of signature and the date of their ratification or approval and not to be bound by any provision of these Final Acts or of the Constitution and the Convention of the International Telecommunication Union restricting its sovereign right to make reservations.

2 Declares that the Kingdom of Tonga considers itself bound by the Radio Regulations (Geneva, 1997), only in so far as it expressly and duly consents to be bound, and subject to the completion of the appropriate procedures established in its domestic law.

3 Declares that the eventual ratification by the Kingdom of Tonga of any provisions of the Final Acts of the Conference which are retrospective in their application is done so only on the basis that such ratification of retrospective provisions is made on an exceptional basis and in exceptional circumstances. The Kingdom of Tonga does not accept that the inclusion in the Final Acts of the Conference of provisions which have a retrospective application sets a precedent for a similar approval of retrospective provisions by future conferences.

No. 36

Original: Spanish

For Mexico:

The Government of Mexico, in signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), expresses the following reservations:

1 the sovereign right to take any action it considers appropriate to regulate its telecommunications;

2 that signature of this instrument does not imply acceptance, either now or in the future, of the payment of financial charges in addition to the contributions laid down in the basic instruments of the Union;

3 the right to safeguard its interests should other Members of the Union cease to comply with the provisions of these Acts;

4 the right to safeguard its interests should reservations by other Members of the Union affect the operation of its telecommunication services;

5 that signature of the Final Acts of the present Conference shall not prejudice its right to make additional reservations or declarations at any time prior to eventual ratification of those Final Acts.

No. 37

Original: English

For the Islamic Republic of Iran:

IN THE NAME OF GOD

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Islamic Republic of Iran formally declares that:

1 In view of the possibility of occurrence of harmful interference from the operation of non-GSO FSS systems in the Ku band to its different services operating or planned in this band, the delegation of the Islamic Republic of Iran reserves for its Government the right to take any measures, if such interference occurs, for securing the continuation or commencement of the interference-free operation of its existing and planned services.

2 In view of the possible endangerment of the interests of its Government due to the application of the decisions of this Conference on the following subjects:

a) early coming into force of the decisions of WRC-95 and WRC-97;

b) matters related to RR **2674 (S23.13)**;

c) matters related to "non-standard parameters", "use of old parameters for a new generation of satellites", "grouping concept", "operation on non-interference basis" and "no reply meaning agreement" for the BSS service in the band 11.7-12.2 GHz,

the delegation of the Islamic Republic of Iran reserves for its Government the right to take any measures aimed at safeguarding its interests.

3 The delegation of the Islamic Republic of Iran reserves for its Government the right to take any action as it may consider necessary to safeguard its interests should they be affected by decisions taken at this Conference, or by failure on the part of any other country or administration in any way to comply with the provisions of the instruments amending the Constitution and Convention of the International Telecommunication Union as adopted by the Plenipotentiary Conference (Kyoto, 1994), or the Annexes or the Protocols and Regulations attached thereto, or these Final Acts, or should the reservations or declarations by other countries or administrations jeopardize the proper and efficient operation of its telecommunication services, or infringe the full exercise of the sovereign rights of the Islamic Republic of Iran.

4 The delegation of the Islamic Republic of Iran reserves for its Government the right to make additional reservations when ratifying the Final Acts of this Conference.

No. 38

Original: English

For the Republic of Latvia and the Republic of Lithuania:

The delegations of the above-mentioned countries reserve for their Governments the right to take action they consider necessary to protect their interests should any Member of the Union fail to comply with the provision of the Final Acts of this Conference or should reservations made upon signing the Final Acts or other measures taken by any Member of the Union jeopardize the proper operation of those countries' telecommunication services.

No. 39

Original: English

For Turkey:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of Turkey reserves for its Government the right to take whatever action it deems necessary to safeguard its interests on the decisions taken by the Conference in modifying, amending, deleting and adding provisions, footnotes, tables, Resolutions and Recommendations in the Radio Regulations, should any Member fail to comply with the Final Acts, Annexes and the Radio Regulations thereto, in using its existing services and introducing new services for space, terrestrial and other applications or should any reservation entered by other countries jeopardize the proper operation of its telecommunication services.

No. 40

Original: English

For the Republic of Zimbabwe:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Republic of Zimbabwe states that its Administration would comply with the provisions of the Final Acts of WRC-97 without prejudice to the Republic of Zimbabwe's sovereign right to take any measures that the Government of Zimbabwe deems necessary to safeguard and protect its telecommunication and other communication services in the event of harmful interference caused to the said services by any Member of the Union failing to comply with the provisions of the Radio Regulations as revised and adopted by this Conference.

No. 41

Original: Spanish

For Ecuador:

In signing the Final Acts, the delegation of Ecuador reserves for its Government the right to take whatever measures it considers necessary should Ecuador's telecommunication services suffer interference from the radio stations of another country, or should its interests be jeopardized in any way by any action of another country, as a result of that country's failure to comply with the decisions of this Conference, or should reservations by other Members of the Union jeopardize its telecommunication services.

In particular, it reserves the right to adopt such measures as it considers appropriate in relation to emissions by commercial radiocommunication systems not authorized to provide services in the territory of Ecuador, and not to recognize as valid claims arising from any utilization of such unauthorized emissions.

No. 42

Original: English

For the Lao People's Democratic Republic:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Lao People's Democratic Republic reserves for its Government the right to take any steps which it may consider necessary to safeguard its interests should Members of the Union fail to comply with the provisions of these Final

Acts, of the Constitution and the Convention of the International Telecommunication Union or the Annexes or Protocols attached thereto, or should the reservations made by other countries compromise the proper operation of its telecommunication services.

With respect to the new beam assigned to China in Step 2 of the Plan revision process at 122.0° E; the delegation has reserved its position on this matter in the Committee, Plenary and these Final Acts on the grounds that the compatibility of the assignments to this beam with the assignments to the LSTAR system may require coordination with the Administration of Lao P.D.R. The information on the LSTAR assignments was filed with the Radiocommunication Bureau before the commencement of WRC-95. That is, before the decisions of that Conference on the matter of Plan revision were known and in accordance with the regulatory regime in force at that time.

No. 43

Original: English

For the People's Republic of China:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the Chinese delegation declares:

1 The Chinese delegation reserves for its Government the right to take such measures and actions it may deem necessary to safeguard its interests should other Members of the International Telecommunication Union in any way fail to comply with or execute the provisions of these Final Acts or the Radio Regulations, or should reservations or declarations made by other Members jeopardize the proper operation of the telecommunication services of China or affect the full exercise of its sovereign rights.

2 In view of the possibility of harmful interference from the operation of MSS and non-GSO FSS in some frequency bands newly allocated to them by the Conference to the use of those services already allocated in these bands, the Chinese delegation reserves for its Government the right to continue to use the existing and planned services in these bands free from harmful interference.

3 It also reserves the right for its Government to make any additional reservation which it considers necessary up to and at the time of its ratification of these Final Acts.

No. 44

Original: English

For the Republic of Mozambique:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Republic of Mozambique reserves the right of its Government to take any action it deems necessary to safeguard its interests in the event of Members failing in any way to comply with the provisions of the Final Acts of the World Radiocommunication Conference (Geneva, 1997), or should reservations by other countries jeopardize its telecommunication services.

No. 45

Original: English

For Canada:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of Canada reserves for its Government the right to take any measures it might deem necessary to safeguard its interests if another Member State of the Union should in any way fail to respect the conditions specified in the Final Acts or if the reservations made by any Member State should be prejudicial to the operation of radiocommunication services in Canada.

The delegation of Canada further declares that it reserves for its Government the right to make any statements or reservations when depositing its instruments of ratification for the Final Acts of the World Radiocommunication Conference (Geneva, 1997).

No. 46

Original: English

For the Republic of Cyprus:

The delegation of the Republic of Cyprus reserves for its Government the right not to be bound by those provisions adopted by the World Radiocommunication Conference (WRC-97), which are potentially retroactive in character and could prejudice the legal situation established under the auspices of the Radio Regulations in force on the date of signature of the present Final Acts.

No. 47

Original: Spanish

For Cuba:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of Cuba reserves for its Government the right to take such action as it deems necessary to safeguard its interests should any Member fail to comply with the provisions of these Final Acts or use its radiocommunication services for purposes contrary to those established in the Preamble to the Constitution of the International Telecommunication Union, or should reservations by any other Member jeopardize its telecommunication services.

The delegation of Cuba also reiterates and incorporates by reference in these Final Acts all its reservations and declarations made at previous world administrative radiocommunication conferences, as well as Declaration No. 40 in the Final Acts of the Plenipotentiary Conference (Kyoto, 1994).

The delegation of Cuba reserves for its Government the right to make any additional reservations which it deems necessary until ratification of the present Final Acts.

No. 48

Original: English

For the Republic of Singapore:

The delegation of the Republic of Singapore reserves for its Government the right to take any action it considers necessary to safeguard its interests should any Member of the Union fail in any way to comply with the requirements of the Final Acts of the World Radiocommunication Conference (Geneva, 1997), or should reservations by any Member of the Union jeopardize the Republic of Singapore's telecommunication services, affect its sovereignty or lead to an increase in its contributory share towards defraying the expenses of the Union.

The delegation of the Republic of Singapore further reserves for its Government the right to make any additional reservations which it considers necessary up to and including the time of its ratification of the Final Acts of the World Radiocommunication Conference (Geneva, 1997).

No. 49

Original: French

For the Republic of Mali:

In signing the Final Acts of this Conference, the delegation of Mali reserves for its Government the right to take any measures and action necessary to protect its national rights and interests should any Members of the Union fail in any way to comply with the provisions of the Final Acts and jeopardize directly or indirectly the interests of its telecommunication services or endanger security or national sovereignty.

No. 50

Original: French

For France:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the French delegation expresses reservations against the possibility that the number and complexity of the texts adopted within a very limited time and the risks due to the speeding up of the process for the approval of documents might give rise to interpretations which were not in conformity with the final consensus of the Conference.

By this reservation, France again draws attention to the consequences of the inconsistency between the modified parameters adopted for the revision of the Appendix **S30** Plan and the unchanged parameters in Annex 4 of Appendix **S30**, which is responsible for ensuring the protection of the Plan against the FSS in Regions 2 and 3. France accordingly reserves the right to apply any regulatory means that might prove necessary in order to ensure the protection to which its broadcasting-satellite networks are entitled under the Appendix **S30** Plan.

More generally, the delegation of France reserves for its Government the right to take any measures it might deem necessary to protect its interests should any Member State of the Union fail to respect the provisions of these Final Acts or to comply with them or should reservations made by other countries jeopardize the efficient operation of its telecommunication services.

No. 51

Original: English

For Portugal:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the Portuguese delegation expresses reservations, should the number and complexity of the texts adopted within a very limited period of time, together with the risks inherent in the acceleration of the approval procedure, give rise to interpretations which are not in conformity with the final consensus of the Conference.

By this reservation, Portugal draws attention to the consequences of inconsistency between those modified parameters considered for the revision of the Plan of Appendix **S30**, and those which remain unchanged in Annex 4 to Appendix **S30** which is intended to ensure protection of the Plan from the FSS in Regions 2 and 3, and as such to the need for revision of this Annex.

In general terms, the Portuguese delegation reserves for its Government the right to take any measures it considers necessary to protect its interests if a Member State of the Union should fail in any way to comply with the provision of these Final Acts, or to conform to those Acts, or if reservations made by other Members should jeopardize proper operation of its telecommunication services.

No. 52

Original: English

For the United States of America:

1 The United States of America refers to No. 445 and No. 446 of the International Telecommunication Union Convention (Geneva, 1992) and notes that in considering the Final Acts of this World Radiocommunication Conference (Geneva, 1997), the United States of America may find it necessary to make additional declarations or reservations. Accordingly, the United States of America reserves the right to make additional declarations or reservations, at the time of deposit of its notification to the International Telecommunication Union, of its consent to be bound by the revisions to the Radio Regulations adopted by this World Radiocommunication Conference.

2 The United States of America shall not be deemed to have consented to be bound by revisions of the Radio Regulations adopted at this Conference without specific notification to the International Telecommunication Union by the United States of America of its consent to be bound.

3 The United States of America reiterates and incorporates by reference all declarations and reservations made at prior world administrative radiocommunication conferences and world radiocommunication conferences.

The United States of America will make all reasonable efforts to comply with the administrative due diligence procedures contained in Resolution **49 (WRC-97)**, but reserves the right not to do so in cases involving satellite networks or satellite systems that transmit government telecommunications as defined under No. 1014 of the Annex to the International Telecommunication Constitution (Geneva, 1992).

The World Radiocommunication Conference (Geneva, 1997) has adopted provisional power limits regarding non-geostationary satellite systems providing fixed-satellite services. The United States of America is committed to protecting existing and planned geostationary satellite systems from unacceptable interference; therefore, the United States of America emphazises that these power limits are provisional, and are subject to detailed technical study and review by ITU-R and to confirmation by the next competent world radiocommunication conference. Any entity proceeding with a non-geostationary satellite system will be obliged to conform to the final regulations adopted at the next competent world radiocommunication conference. The United States of America is committed to participating fully in the ITU-R study of power limits that protect existing and planned geostationary-satellite and terrestrial services, while enabling new non-geostationary fixed-satellite technologies to develop.

The United States of America refers to Resolution **536 (WRC-97)** and notes the United States of America's intent to enter into the type of agreements contemplated under No. **S23.13** [RR **2674**]. The United States of America further notes that it disagrees with aspects of the resolution that would encourage administrations originating satellite broadcasting services to other administrations to obtain further agreement of administrations before providing such service. It is the view of the United States of America that these additional agreements could be used to interfere with the free flow of information, which would conflict with Article 19 of the Universal Declaration of Human Rights, adopted by the United Nations General Assembly in 1948, and Recommendation 2 adopted at the Plenipotentiary Conference of the International Telecommunication Union (Kyoto, 1994).

No. 53

Original: English

For the Federated States of Micronesia:

The United States of America, acting on behalf of the Government of the Federated States of Micronesia pursuant to No. 335 of the International Telecommunication Union Convention (Geneva, 1992), reserves for the Government of the Federated States of Micronesia the right to make declarations and reservations at the time of deposit of its notification to the International Telecommunication Union of the Government of the Federated States of Micronesia's consent to be bound by the revisions to the Radio Regulations adopted by this World Radiocommunication Conference.

No. 54

Original: Spanish

For the Republic of Colombia:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Republic of Colombia:

1 Declares that it reserves for its Government the right:

a) To take any measures it may deem necessary, in conformity with its domestic law and with international law, to safeguard its national interests should any other Members fail to comply with the provisions of the Final Acts of the World Radiocommunication Conference (Geneva, 1997), or should reservations by representatives of other States jeopardize the radiocommunication services of the Republic of Colombia or its full sovereign rights.

b) To express reservations, under the Vienna Convention on the Law of Treaties of 1969, with regard to the Final Acts of the World Radiocommunication Conference (Geneva, 1997), at any time it sees fit between the date of the signature and the date of the possible ratification of the international instruments constituting those Final Acts.

2 Reaffirms, in their essence, reservations Nos. 40 and 79 made at the World Administrative Radio Conference (Geneva, 1979), especially with regard to the new provisions included in the documents of the Final Acts.

3 Declares that the Republic of Colombia considers itself bound by the instrument contained in the Final Acts only in so far as it expressly and duly consents to be bound by that international instrument, and subject to the completion of the appropriate constitutional procedures.

4 Declares that in conformity with its Constitution, its Government cannot give provisional effect to the international instruments which constitute the Final Acts of the World Radiocommunication Conference (Geneva, 1997).

No. 55

Original: English

For the Republic of India:

In signing the Final Acts of the World Radiocommunication Conference, Geneva, 1997 (WRC-97), the delegation of the Republic of India reserves for its Government the right to take such actions, as may be considered necessary, to safeguard its interests should any Administration make reservations and/or not accept the provisions of the Final Acts or fail to comply with one or more provisions of the Final Acts, including those which form a part of the Radio Regulations.

No. 56

Original: English

For the Islamic Republic of Pakistan:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), Pakistan's delegation declares that:

1 The delegation of the Islamic Republic of Pakistan reserves its Government's right of ratification of the decisions taken by the WRC-97 Conference, in accordance with the National Law, and further reserves the right of its Government to take effective steps to safeguard and protect its interest if any administration operates any satellite, broadcasting and other telecommunication services/systems in violation of the Radio Regulations in force or the decisions taken by the World Radiocommunication Conference (WRC-97) and ratified by the Government of the Islamic Republic of Pakistan. It also further reserves the right of its Government to take steps if reservations or declarations made by any other country or administration jeopardize the proper and efficient operation of its satellites, broadcasting, telecommunication and other electronic and radio systems/services.

2 The Government of the Islamic Republic of Pakistan cannot undertake to accept any transmission to or infringement of its territory by means of radio transmissions of any other administration and reserves its right to take such steps as necessary should this happen.

3 The decisions of the World Radiocommunication Conference (WRC-97) for dealing with frequency allocations in certain parts of the spectrum regarding areas falling within the territories of the disputed States of Jammu and Kashmir are without prejudice to the position recognized by the relevant resolutions of the United Nations on the question.

4 The delegation of the Islamic Republic of Pakistan reserves for its Government the right to make additional reservations when ratifying the Final Acts. It also reserves the right to amend the above listed reservations.

No. 57

Original: English

For Brunei Darussalam:

The delegation of Brunei Darussalam reserves for its Government the right to take any action which it deems necessary to safeguard its interests should any Member of the Union fail in any way to comply with the Radio Regulations as amended by the Final Acts of the World Radiocommunication Conference (Geneva, 1997), or should any reservations by any Member of the Union jeopardize Brunei Darussalam's radiocommunication or telecommunication services, affect its sovereignty or lead to an increase in its contributory share towards defraying the expenses of the Union.

The delegation of Brunei Darussalam further reserves for its Government the right to make any additional reservations which it deems necessary up to and including the time of its ratification of the Final Acts of the World Radiocommunication Conference (Geneva, 1997).

No. 58

Original: English

For the Federative Republic of Brazil:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Federative Republic of Brazil reserves for its Government the right to take any measures it may deem necessary to safeguard its interests if another Member State fails in any way to comply with the provisions of these Acts or if the reservations made by any other Member State should be prejudicial to efficient operation of radiocommunication services in Brazil.

In addition, Brazil reserves the right to make specific reservations prior to ratification of these Final Acts.

No. 59

Original: English

For the Republic of Estonia:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Republic of Estonia reserves the right for its Government to take such actions as it may consider necessary to safeguard its interests if any Member State of the International Telecommunication Union fails in any way to observe or comply with the provisions of these Final Acts or should reservations by other countries jeopardize the proper operation of its radiocommunication services.

No. 60

Original: English

For Luxembourg:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of Luxembourg declares that, with respect to the entries in the BSS Plan for the satellite identified as EUROPESAT-1, and for which Note 8 in Appendix **30** and Note 9 in Appendix **30A** indicate that these entries are “pending clarification of the bringing into use of this satellite network”, Luxembourg does not consider that this network has been brought into service within the time period specified in Articles 4 of Appendix **30** and **30A** and consequently will not take these assignments into consideration.

No. 61

Original: English

For Papua New Guinea:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of Papua New Guinea, in light of declarations and reservations deposited by other Member States of the ITU, is obliged to reserve for its Government the right to take such actions as it may consider necessary to safeguard its interests should any Member State of the ITU fail to observe the provisions adopted by this Conference and in so doing cause harmful interference to, or, should reservations or actions by such Member States jeopardize the operation of radiocommunication and/or telecommunication systems and services which are under the jurisdiction of the Government of Papua New Guinea.

No. 62

Original: English

For the Socialist Republic of Viet Nam:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997) the Vietnamese delegation on behalf of the Socialist Republic of Viet Nam declares that:

1 it maintains the reservations made at the Nairobi Plenipotentiary Conference (1982) and which were reaffirmed at Plenipotentiary Conferences of the International Telecommunication Union held in Nice, 1989, Geneva, 1992 and Kyoto, 1994;

2 it reserves for its Government the right to take any action as it may consider necessary to safeguard its interests should reservations or declarations by any Members of the Union jeopardize its telecommunication services or affect its national sovereignty.

No. 63

Original: English

For the Slovak Republic:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Slovak Republic reserves for its Government the right to take any action as it deems necessary, to safeguard its interests should any

Member of the ITU fail in any way to comply with the Final Acts and Annexes or should the reservations made by the representatives of other States jeopardize the proper operation of its telecommunication services.

No. 64

Original: Russian

For the Republic of Armenia, the Republic of Belarus, Georgia, the Republic of Kazakstan, the Republic of Moldova, the Republic of Uzbekistan, the Kyrgyz Republic, the Russian Federation and Ukraine:

The delegations of the above-mentioned countries reserve for their Governments the right to take the action they consider necessary to protect their interests should any Member of the Union fail to comply with the provisions of the Final Acts of this Conference or should reservations made upon signing the Final Acts or other measures taken by any Member of the Union jeopardize the proper operation of those countries' telecommunication services.

No. 65

Original: English

For the Republic of Korea:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Republic of Korea reserves the right for its Government to take such action as it may consider necessary to safeguard its interests should any Member of the Union make reservations or fail to comply with the provisions of the Final Acts of this Conference.

ADDITIONAL DECLARATIONS

No. 66

Original: English

For the Republic of the Sudan:

Taking note of declarations in Document 400, in signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Republic of Sudan declares on behalf of its Government that the Government reserves the right to take any action it may deem necessary consistent with its national law and with international law, to safeguard its national interests, should other Members fail to comply with the Constitution or the Convention of ITU (Geneva, 1992) or should reservations by representatives of other States jeopardize its telecommunications services or its full sovereign rights.

No. 67

Original: English

For the Hashemite Kingdom of Jordan:

Having studied the declarations contained in Document 400, the Hashemite Kingdom of Jordan, in signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), reserves the right for its Government to take any measures it might deem necessary to safeguard its interests if another country should in any way fail to respect the conditions specified in the Final Acts or if the reservations made by another country should be prejudicial to the operation of radiocommunication services of the Hashemite Kingdom of Jordan.

In view of the possibility of harmful interference from the operation of non-GSO MSS, including their feeder links, and non-GSO FSS in some frequency bands newly allocated to them by the Conference (Geneva, 1997) to the use of these bands, the delegation of the Hashemite Kingdom of Jordan reserves for its Government the right to continue to use the existing and planned services in these bands free from harmful interference.

Furthermore, the delegation of Jordan declares that the Government of the Hashemite Kingdom of Jordan reserves the right to make any change when depositing its instruments of ratification for the Final Acts of the World Radiocommunication Conference (Geneva, 1997).

No. 68

Original: English

For the Republic of the Philippines:

In taking note of Document 400 containing the reservations and in signing the Finals Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Republic of the Philippines reserves for its Government the right to take any action it deems necessary and sufficient, consistent with its national law to safeguard its interests, should reservations made by representatives of other States jeopardize its telecommunication services or prejudice its rights as a sovereign country.

The Philippines delegation further reserves for its Government the right to make any declaration or reservations prior to the deposit of the instrument of ratification of the Final Acts of the World Radiocommunication Conference 1997, held in Geneva, from 27 October to 21 November 1997.

No. 69

Original: English

For the Republic of Uganda:

Having taken note of the declarations in Document 400 of the World Radiocommunication Conference (Geneva, 1997), the delegation of Uganda in signing the Final Acts reserves for its Government the right to take such action as it may consider necessary to safeguard its interests should any Member fail in any way to comply with the requirements of the Finals Acts of the World Radiocommunication Conference (Geneva, 1997), or Annexes thereto, or should reservations by other countries jeopardize its interests.

No. 70

Original: English

For the Republic of Kenya:

After having considered the declarations contained in Conference Document 400, the delegation of the Republic of Kenya to the World Radiocommunication Conference (Geneva, 1997) herewith declares on behalf of its Government and on behalf of the powers conferred on it:

1 that it reserves the right of its Government to take any action it may consider necessary to safeguard and protect its interests should any Member fail to comply as required with the provisions in the Final Acts and Annexes thereto adopted by this Conference;

2 that in addition, it reserves the right of its Government to take any action it may deem necessary to safeguard and protect its interests should the declarations and/or reservations entered by other delegations in any way affect the normal operation and promotion of telecommunication services in Kenya;

3 that it reserves the right to enter further reservations prior to the ratification of the Final Acts of WRC-97;

4 that in no way does the signing of the Final Acts of WRC-97 compromise any provisions of the Constitution and the Laws of the Republic of Kenya.

No. 71

Original: English

For the Federal Democratic Republic of Ethiopia:

Having noted Document 400 and in signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Government of the Federal Democratic Republic of Ethiopia reserves the right of its Government to take any step it may deem necessary to safeguard its interests should other Members fail to comply with these instruments or their reservations jeopardize its telecommunications services.

No. 72

Original: French

For Burkina Faso:

After taking note of Document 400 and, in signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of Burkina Faso declares:

1 that it reserves for its Government the right to take any action it considers appropriate to safeguard and protect its interests should any Member fail to comply with the provisions contained in the Final Acts of this Conference;

2 that its Government accepts no responsibility for the consequences of reservations expressed by Members of the Union.

No. 73

Original: English

For the Republic of India:

The delegation of the Republic of India notes with regret the reference to the States of Jammu and Kashmir, in paragraph 3 of Declaration 56 (Document 400) made by the delegation of the Islamic Republic of Pakistan. The delegation of India reiterates that the States of Jammu and Kashmir are an integral part of the sovereign Republic of India. The delegation of the Republic of India therefore reserves the right for its Government to take appropriate measures to safeguard its interests as a result of any action on the part of the Islamic Republic of Pakistan, as a result of Declaration 56.

No. 74

Original: English

For the United Republic of Tanzania:

Having taken note of Document 400 of the World Radiocommunication Conference (Geneva, 1997), the delegation of the United Republic of Tanzania reserves for its Government the right:

1 to take such action as it may deem necessary to safeguard its interests should any Member fail to comply in any way whatever with the decisions taken by this Conference, or should reservations entered by other Members be such as to jeopardize the operation of its telecommunication services;

2 to accept or reject the consequences of decisions which might directly jeopardize its sovereignty, in particular any relating to the increased use of satellite services including but not limited to mobile, geostationary, fixed and broadcasting in the bands below 1 GHz, 1 GHz to 3 GHz and above 3 GHz.

No. 75

Original: Spanish

For the Republic of Venezuela:

Having taken note of the declarations presented by many delegations, the delegation of the Republic of Venezuela to the World Radiocommunication Conference (Geneva, 1997), declares the following reservation at signing the Final Acts of the WRC-97 and reserves the right for its Government to take such action as it may consider necessary to safeguard its interests should any Member State of the Union fail in any way to observe or comply with the provisions of these Final Acts or should reservations by other countries jeopardize the proper operation of its radiocommunications services.

No. 76

Original: English

For Mongolia:

Having taken note of Document 400 and in signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the Mongolian delegation declares on behalf of its Government that:

1 in view of the possibility of harmful interference from future operation of mobile-satellite services in certain frequency bands in accordance with the decisions of the Conference may affect the use by Mongolia of existing services in these bands. Therefore, the Mongolian delegation reserves for its Government the right to continue to use the existing and planned services in these bands free from harmful interference;

2 given that some parts of the Final Acts were adopted in very limited time and in the case of legal confusion which might ensue as a consequence, the Mongolian delegation reserves for its Government the right to take any measures aimed at safeguarding its interests;

3 the Mongolian delegation reserves for its Government the right to take any action it may consider necessary to safeguard its interests should any of the reservations or declarations by other Members jeopardize its telecommunication services or threaten its national sovereignty.

No. 77

Original: English

For the People's Republic of China:

With respect to Declaration 42, the People's Republic of China declares:

1 that the satellite system (LSTAR system) referred to by the Lao People's Democratic Republic has not successfully completed coordination before the cut-off date of 3 November 1997 and is therefore not a part of the revised Broadcasting-Satellite Service Plan adopted by the World Radiocommunication Conference (Geneva, 1997);

2 that the LSTAR system of the Lao People's Democratic Republic therefore has no priority over the assignments at 122.0° E for China in the revised Broadcasting-Satellite Service Plan adopted by the World Radiocommunication Conference (Geneva, 1997), and as such the LSTAR system is required to follow all the relevant provisions of the Radio Regulations.

No. 78

Original: English

For the Arab Republic of Egypt:

Having taken note of Document 400, and in signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of Egypt reserves for its Government the right to take any action it considers appropriate to safeguard its interests should any Member or Members of the International Telecommunication Union fail in any way to comply with, or apply the provisions of these Final Acts of this Conference, or should any acts of other entities affect its national sovereignty.

No. 79

Original: Spanish

For Costa Rica:

In the light of Document 400 and in signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Republic of Costa Rica declares:

1 that it reserves for the Government of Costa Rica the right to take any action it considers necessary should Costa Rica's telecommunication services suffer interference from radiocommunication stations of another country and should its interests be jeopardized in any way by any other country as a result of failure to comply with the decisions adopted at the Conference;

2 Costa Rica also reserves the right to enter specific reservations prior to ratifying these Final Acts.

No. 80

Original: English

For the Republic of the Gambia:

Having noted Document 400, in signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Republic of the Gambia reserves for its Government the right to take any action and preservation measures it deems necessary to safeguard its national interests should decisions taken at this Conference, reservations expressed by other Members of the Union with regard to the Final Acts or non-compliance with the provisions of the revised Radio Regulations, affect the efficient operation of its telecommunication services.

No. 81

Original: English

For the United States of America:

The United States of America refers to declarations made by various Members reserving their rights to take any such actions as they may consider necessary to safeguard their interests in response to reservations by other countries which jeopardize their interests, application of provisions of the International Telecommunication Union Constitution

and Convention (Geneva, 1992) which adversely affect their interests, and other Members not sharing in defraying the expenses of the Union. The United States of America reserves the right to take whatever measures it may consider necessary to safeguard United States interests in response to such actions.

No. 82

Original: English

For the United States of America:

The United States of America, noting the Statement (No. 47) entered by the delegation of Cuba, recalls its rights to broadcast to Cuba on appropriate frequencies free of jamming or other wrongful interference and reserves its rights with respect to existing interference and any future interference by Cuba with United States broadcasting. Furthermore, the United States of America notes that its presence in Guantanamo is by virtue of an international agreement presently in force; the United States of America reserves the right to meet its radiocommunication requirements there as heretofore.

No. 83

Original: English

For the State of Israel:

The State of Israel would like to add its support to the last part of Declaration 52 made by the United States of America with regard to Resolution **536 (WRC-97)**.

No. 84

Original: English

For the State of Israel:

Declaration 10 to the Final Acts made by certain delegations is incompatible with the principles, objects and purpose of the Constitution and Convention of the International Telecommunication Union and is therefore devoid of all legal validity.

With regard to the substance of the matter, the Government of Israel will adopt towards the Member States whose delegations have made the above-mentioned Declaration, a position of complete reciprocity. In view of this Declaration, the Government of Israel reserves its right to take any action deemed necessary to protect its interests and to safeguard the operation of its telecommunication services.

No. 85

Original: English

For the Republic of Bulgaria:

Having noted Document 400 and in signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of the Republic of Bulgaria reserves for its Government the right to take any measures it might deem necessary to safeguard its interests if another Member State of the Union should in any way fail to respect the conditions specified in the Final Acts or if the reservations made by any Member State should be prejudicial to the operation of radiocommunication services in Bulgaria.

No. 86

Original: English

For The Former Yugoslav Republic of Macedonia:

Having taken note of the declarations presented by many Members of the Union, the delegation of the Republic of Macedonia to the World Radiocommunication Conference (Geneva, 1997):

1 declares that its Government reserves the right to take such actions as it may consider necessary to protect its interests in cases where a Member of the Union fails to comply with the provisions of the Radio Regulations as modified by the Final Acts of the World Radiocommunication Conference (Geneva, 1997), or make reservations that jeopardize the operation of its radiocommunication services;

2 further reserves the rights of its Government to make additional declarations or reservations as may be necessary when depositing its instruments of ratification of the Final Acts of the World Radiocommunication Conference (Geneva, 1997).

No. 87

Original: Russian

For the Russian Federation:

Taking into account the declarations formulated in signing the Final Acts of the Conference, the delegation of the Russian Federation, in order to retain the same possibilities, also reserves for its Government the right not to apply the administrative procedure foreseen in Resolution **49 (WRC-97)** for Russian satellite networks and satellite systems used for government purposes.

No. 88

Original: English

For the Federal Republic of Germany, Australia, the Republic of Cyprus, Denmark, the United States of America, France, the Republic of India, Ireland, Italy, Japan, the Principality of Liechtenstein, Luxembourg, Malta, Norway, the Kingdom of the Netherlands, Portugal, the Slovak Republic, the Czech Republic, Romania, the United Kingdom of Great Britain and Northern Ireland, the Republic of Slovenia, Sweden, the Confederation of Switzerland:

The delegations of the above-mentioned countries referring to the Declaration made by the Republic of Colombia (No. 54), inasmuch as this statement refers to the Bogota Declaration of 3 December 1976 by equatorial countries and to the claims of those countries to exercise sovereign rights over segments of the geostationary-satellite orbit, and any similar statements, consider the claims in question cannot be recognized by this Conference. Further, the above-mentioned delegations wish to affirm or reaffirm the declarations made on behalf of a number of the above-mentioned Administrations in this regard when signing the Final Acts of previous conferences of the International Telecommunication Union as if these declarations were here repeated in full.

The above-mentioned delegations also wish to state that reference in Article 44 of the Constitution to the “geographical situation of particular countries” does not imply a recognition of claim to any preferential rights to the geostationary-satellite orbit.

No. 89

Original: English

For Malta:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 1997), the delegation of Malta, having regard to declarations made by Members of the Union, declares that it reserves for its Government the right to make specific reservations at any time it considers proper between the date of signature and the date of ratification of these Final Acts.

No. 90

Original: English

For the United Kingdom of Great Britain and Northern Ireland:

With reference to the Declaration made by Spain (No. 28), the United Kingdom's position on Gibraltar is well-known and remains unchanged. British sovereignty over Gibraltar derives from the Treaty of Utrecht.

We do not agree that the composition of the United Kingdom delegation to this Conference is a political matter relating directly to the dispute between the United Kingdom and Spain concerning Gibraltar.

The composition of the United Kingdom delegation is solely a matter for the Government of the United Kingdom of Great Britain and Northern Ireland and is in line with existing practice in this and other United Nations fora. The United Kingdom believes that the ITU is a purely technical body and should remain so.

No. 91

Original: English

For Greece:

The Greek delegation, referring to the Declaration of The Former Yugoslav Republic of Macedonia at the WRC-95 under No. 31 and Document 371 of the World Radiocommunication Conference (Geneva, 1997), wishes to recall that on the occasion of the admission of The Former Yugoslav Republic of Macedonia to the United Nations, the Security Council by its Resolution 817/93 recognizes that “a difference has arisen over the name of the State, which needs to be resolved in the interests of the

maintenance of peaceful and good-neighbourly relations in the region" and establishes "The Former Yugoslav Republic of Macedonia" as the provisional name for this State. It should also be added that the statement by the then President of the Security Council, upon adoption of Resolution 817/93, calls on all sides "to avoid taking steps that would render a solution more difficult".

In this connection the Greek delegation declares that the denomination and code name used in the above-mentioned Declaration and in Document 371 of the present Conference, respectively, are not in conformity with the name under which that State has been admitted to the United Nations and the International Telecommunication Union, and therefore, this terminology cannot be accepted.

Partial revision of the Radio Regulations

ARTICLES

ARTICLE S1

Terms and Definitions

NOC **S1.1** to **S1.60**

Section IV. Stations et systèmes radioélectriques

NOC **S1.61** to **S1.66**

ADD **S1.66A** *High Altitude Platform Station*: A station located on an object at an altitude of 20 to 50 km and at a specified, nominal, fixed point relative to the Earth.

NOC **S1.67** to **S1.109**

ADD **S1.109A** *Adaptive System:* A radiocommunication system which varies its radio characteristics according to channel quality.

NOC **S1.110** to **S1.191**

ARTICLE S4

Assignment and Use of Frequencies

NOC **S4.1** to **S4.3**

MOD **S4.4** Administrations of the Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations.

NOC **S4.5** to **S4.15**

ADD **S4.15A** Transmissions to or from high altitude platform stations shall be limited to bands specifically identified in Article **S5**.

NOC **S4.16** to **S4.22**

ARTICLE S5

Frequency Allocations

NOC **S5.1** to **S5.52**

Section IV. Table of Frequency Allocations

NOC **S5.53** and **S5.54**

MOD **S5.55** *Additional allocation:* in Armenia, Azerbaijan, Bulgaria, Georgia, Kazakstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan and Ukraine, the band 14-17 kHz is also allocated to the radionavigation service on a primary basis.

MOD **S5.56** The stations of services to which the bands 14-19.95 kHz and 20.05-70 kHz and in Region 1 also the bands 72-84 kHz and 86-90 kHz are allocated may transmit standard frequency and time signals. Such stations shall be afforded protection from harmful interference. In Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Kazakstan, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Republic, Russia, Tajikistan, Turkmenistan and Ukraine, the frequencies 25 kHz and 50 kHz will be used for this purpose under the same conditions.

NOC **S5.57**

MOD **S5.58** *Additional allocation:* in Armenia, Azerbaijan, Bulgaria, Georgia, Kazakstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan and Ukraine, the band 67-70 kHz is also allocated to the radionavigation service on a primary basis.

NOC **S5.59** to **S5.62**

SUP **S5.63**

NOC **S5.64** to **S5.66**

MOD **S5.67** *Additional allocation:* in Azerbaijan, Bulgaria, Mongolia, Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 130-148.5 kHz is also allocated to the radionavigation service on a secondary basis. Within and between these countries this service shall have an equal right to operate.

NOC **S5.68** to **S5.72**

MOD **S5.73** The band 285-325 kHz (283.5-325 kHz in Region 1) in the maritime radionavigation service may be used to transmit supplementary navigational information using narrow-band techniques, on condition that no harmful interference is caused to radiobeacon stations operating in the radionavigation service.

MOD

kHz
315-495

<table>
<tr><td colspan="3">Allocation to Services</td></tr>
<tr><td>Region 1</td><td>Region 2</td><td>Region 3</td></tr>
<tr><td>415-435
MARITIME MOBILE S5.79
AERONAUTICAL RADIONAVIGATION
S5.72</td><td colspan="2" rowspan="2">415-495
MARITIME MOBILE S5.79 S5.79A
Aeronautical Radionavigation S5.80</td></tr>
<tr><td>435-495
MARITIME MOBILE S5.79 S5.79A
Aeronautical Radionavigation
S5.72 S5.81 S5.82</td></tr>
<tr><td colspan="2">S5.77 S5.78 S5.81 S5.82</td></tr>
</table>

NOC **S5.74** to **S5.79**

ADD **S5.79A** When establishing coast stations in the NAVTEX service on the frequencies 490 kHz, 518 kHz and 4 209.5 kHz, administrations are strongly recommended to coordinate the operating characteristics in accordance with the procedures of the International Maritime Organization (IMO) (see Resolution **339 (Rev.WRC-97)**).

NOC **S5.80**

MOD **S5.81** The bands 490-495 kHz and 505-510 kHz shall be subject to the provisions of Appendix **S13,** § 15(1), Part A2.

MOD **S5.82** In the maritime mobile service, the frequency 490 kHz is, from the date of full implementation of the GMDSS (see Resolution **331 (Rev.WRC-97)**), to be used exclusively for the transmission by coast stations of navigational and meteorological warnings and urgent information to ships, by means of narrow-band direct-printing telegraphy. The conditions for use of the frequency 490 kHz are prescribed in Articles **S31** and **S52**. In using the band 415-495 kHz for the aeronautical radionavigation service, administrations are requested to ensure that no harmful interference is caused to the frequency 490 kHz.

NOC **S5.83**

MOD

kHz
495-1 606.5

Allocation to Services		
Region 1	Region 2	Region 3
505-526.5 MARITIME MOBILE S5.79 S5.79A S5.84 AERONAUTICAL RADIONAVIGATION S5.72 S5.81	**505-510** MARITIME MOBILE S5.79 S5.81 **510-525** MOBILE S5.79A S5.84 AERONAUTICAL RADIONAVIGATION	**505-526.5** MARITIME MOBILE S5.79 S5.79A S5.84 AERONAUTICAL RADIONAVIGATION Aeronautical Mobile Land Mobile S5.81
526.5-1 606.5 BROADCASTING S5.87 S5.87A	**525-535** BROADCASTING S5.86 AERONAUTICAL RADIONAVIGATION **535-1 605** BROADCASTING	**526.5-535** BROADCASTING Mobile S5.88 **535-1 606.5** BROADCASTING

MOD **S5.84** The conditions for the use of the frequency 518 kHz by the maritime mobile service are prescribed in Articles **S31** and **S52** and in Appendix **S13**.

NOC **S5.85** to **S5.87**

ADD **S5.87A** *Additional allocation:* in Uzbekistan, the band 526.5-1 606.5 kHz is also allocated to the radionavigation service on a primary basis. Such use is subject to agreement obtained under No. **S9.21** with administrations concerned and limited to ground-based radiobeacons in operation on 27 October 1997 until the end of their lifetime.

NOC **S5.88** to **S5.90**

MOD **S5.91** *Additional allocation:* in the Philippines and Sri Lanka, the band 1 606.5-1 705 kHz is also allocated to the broadcasting service on a secondary basis.

NOC **S5.92** to **S5.97**

MOD **S5.98** *Alternative allocation:* in Angola, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Cameroon, the Congo, Denmark, Egypt, Eritrea, Spain, Ethiopia, Georgia, Greece, Italy, Kazakstan, Lebanon, Lithuania, Moldova, the Netherlands, Syria, Kyrgyzstan, Russia, Somalia, Tajikistan, Tunisia, Turkmenistan, Turkey and Ukraine, the band 1 810-1 830 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

MOD **S5.99** *Additional allocation:* in Saudi Arabia, Bosnia and Herzegovina, Iraq, Libya, Uzbekistan, Slovakia, the Czech Republic, Romania, Slovenia, Chad, Togo and Yugoslavia, the band 1 810-1 830 kHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

NOC **S5.100** to **S5.106**

MOD **S5.107** *Additional allocation:* in Saudi Arabia, Botswana, Eritrea, Ethiopia, Iraq, Lesotho, Libya, Somalia, Swaziland and Zambia, the band 2 160-2 170 kHz is also allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis. The mean power of stations in these services shall not exceed 50 W.

NOC **S5.108** to **S5.111**

MOD **S5.112** *Alternative allocation:* in Bosnia and Herzegovina, Cyprus, Denmark, France, Greece, Iceland, Italy, Malta, Norway, Sri Lanka, Turkey and Yugoslavia, the band 2 194-2 300 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

NOC **S5.113**

MOD **S5.114** *Alternative allocation:* in Bosnia and Herzegovina, Cyprus, Denmark, France, Greece, Iraq, Italy, Malta, Norway, Turkey and Yugoslavia, the band 2 502-2 625 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

NOC **S5.115** and **S5.116**

MOD **S5.117** *Alternative allocation:* in Bosnia and Herzegovina, Cyprus, Côte d'Ivoire, Denmark, Egypt, France, Greece, Iceland, Italy, Liberia, Malta, Norway, Sri Lanka, Togo, Turkey and Yugoslavia, the band 3 155-3 200 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

NOC **S5.118** to **S5.127**

MOD

kHz
4 063-5 450

Allocation to Services		
Region 1	Region 2	Region 3
4 063-4 438	MARITIME MOBILE S5.79A S5.109 S5.110 S5.130 S5.131 S5.132 S5.128 S5.129	

MOD **S5.128** In Afghanistan, Argentina, Armenia, Azerbaijan, Belarus, Botswana, Burkina Faso, Central African Republic, China, Georgia, India, Kazakstan, Mali, Niger, Kyrgyzstan, Russia, Tajikistan, Chad, Turkmenistan and Ukraine, in the bands 4 063-4 123 kHz, 4 130-4 133 kHz and 4 408-4 438 kHz, stations of limited power in the fixed service which are situated at least 600 km from the coast may operate on condition that harmful interference is not caused to the maritime mobile service.

NOC **S5.129** and **S5.130**

MOD **S5.131** The frequency 4 209.5 kHz is used exclusively for the transmission by coast stations of meteorological and navigational warnings and urgent information to ships by means of narrow-band direct-printing techniques.

NOC **S5.132** and **S5.133**

MOD **S5.134** The use of the bands 5 900-5 950 kHz, 7 300-7 350 kHz, 9 400-9 500 kHz, 11 600-11 650 kHz, 12 050-12 100 kHz, 13 570-13 600 kHz, 13 800-13 870 kHz, 15 600-15 800 kHz, 17 480-17 550 kHz and 18 900-19 020 kHz by the broadcasting service is limited to single-sideband emissions with the characteristics specified in Appendix **S11** to the Radio Regulations or to any other spectrum-efficient modulation techniques recommended by ITU-R. Access to these bands shall be subject to the decisions of a competent conference.

SUP **S5.135**

NOC **S5.136** to **S5.140**

MOD **S5.141** *Alternative allocation:* in Egypt, Eritrea, Ethiopia, Guinea, Libya and Madagascar, the band 7 000-7 050 kHz is allocated to the fixed service on a primary basis.

NOC **S5.142** to **S5.147**

SUP **S5.148**

MOD **S5.149** In making assignments to stations of other services to which the bands:

13 360-13 410 kHz,
25 550-25 670 kHz,
37.5-38.25 MHz,
73-74.6 MHz in Regions 1 and 3,
150.05-153 MHz in Region 1,
322-328.6 MHz*,
406.1-410 MHz,
608-614 MHz in Regions 1 and 3,
1 330-1 400 MHz*,
1 610.6-1 613.8 MHz*,
1 660-1 670 MHz,
1 718.8-1 722.2 MHz*,
2 655-2 690 MHz,
3 260-3 267 MHz*,
3 332-3 339 MHz*,
3 345.8-3 352.5 MHz*,
4 825-4 835 MHz*,
4 950-4 990 MHz,
4 990-5 000 MHz,
6 650-6 675.2 MHz*,
10.6-10.68 GHz,
14.47-14.5 GHz*,
22.01-22.21 GHz*,
22.21-22.5 GHz,
22.81-22.86 GHz*,
23.07-23.12 GHz*,
31.2-31.3 GHz,
31.5-31.8 GHz in Regions 1 and 3,
36.43-36.5 GHz*,
42.5-43.5 GHz,
42.77-42.87 GHz*,
43.07-43.17 GHz*,
43.37-43.47 GHz*,
48.94-49.04 GHz*,
72.77-72.91 GHz*,
93.07-93.27 GHz*,
97.88-98.08 GHz*,
140.69-140.98 GHz*,
144.68-144.98 GHz*,
145.45-145.75 GHz*,
146.82-147.12 GHz*,
150-151 GHz*,
174.42-175.02 GHz*,
177-177.4 GHz*,
178.2-178.6 GHz*,
181-181.46 GHz*,
186.2-186.6 GHz*,
250-251 GHz*,
257.5-258 GHz*,
261-265 GHz,
262.24-262.76 GHz*,
265-275 GHz,
265.64-266.16 GHz*,
267.34-267.86 GHz*,
271.74-272.26 GHz*

are allocated (* indicates radio astronomy use for spectral line observations), administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from spaceborne or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. **S4.5** and **S4.6** and Article **S29**).

NOC **S5.150** and **S5.151**

MOD **S5.152** *Additional allocation:* in Armenia, Azerbaijan, China, Côte d'Ivoire, Georgia, the Islamic Republic of Iran, Kazakstan, Moldova, Uzbekistan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan and Ukraine, the band 14 250-14 350 kHz is also allocated to the fixed service on a primary basis. Stations of the fixed service shall not use a radiated power exceeding 24 dBW.

NOC **S5.153**

MOD **S5.154** *Additional allocation:* in Armenia, Azerbaijan, Georgia, Kazakstan, Moldova, Uzbekistan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan and Ukraine, the band 18 068-18 168 kHz is also allocated to the fixed service on a primary basis for use within their boundaries, with a peak envelope power not exceeding 1 kW.

MOD

MHz
40.98-68

<table>
<tr><td colspan="3">Allocation to Services</td></tr>
<tr><td>Region 1</td><td>Region 2</td><td>Region 3</td></tr>
<tr><td colspan="3">44-47
FIXED
MOBILE
S5.162 S5.162A</td></tr>
<tr><td rowspan="3">47-68
BROADCASTING

S5.162A S5.163 S5.164
S5.165 S5.169 S5.171</td><td>47-50
FIXED
MOBILE</td><td>47-50
FIXED
MOBILE
BROADCASTING</td></tr>
<tr><td colspan="2">50-54
AMATEUR
S5.166 S5.167 S5.168 S5.170</td></tr>
<tr><td>54-68
BROADCASTING
Fixed
Mobile

S5.172</td><td>54-68
FIXED
MOBILE
BROADCASTING</td></tr>
</table>

NOC **S5.155** to **S5.159**

MOD **S5.160** *Additional allocation:* in Botswana, Burundi, Lesotho, Malawi, Namibia, Rwanda, Swaziland and Zaire, the band 41-44 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

NOC **S5.161** and **S5.162**

ADD **S5.162A** *Additional allocation:* in Germany, Austria, Belgium, Bosnia and Herzegovina, China, Vatican, Denmark, Spain, Estonia, Finland, France, Ireland, Iceland, Italy, Latvia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Lithuania, Luxembourg, Moldova, Monaco, Norway, the Netherlands, Poland, Portugal, Slovakia, the Czech Republic, the United Kingdom, Russia, Sweden, Switzerland and Turkey, the band 46-68 MHz is also allocated to the radiolocation service on a secondary basis. This use is limited to the operation of wind profiler radars in accordance with Resolution **217 (WRC-97)**.

NOC **S5.163**

MOD **S5.164** *Additional allocation:* in Albania, Germany, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Côte d'Ivoire, Denmark, Spain, Finland, France, Gabon, Greece, Ireland, Israel, Italy, Jordan, Lebanon, Libya, Liechtenstein, Luxembourg, Madagascar, Mali, Malta, Morocco, Mauritania, Monaco, Nigeria, Norway, the Netherlands, Poland, Syria, the United Kingdom, Senegal, Slovenia, Sweden, Switzerland, Swaziland, Togo, Tunisia, Turkey and Yugoslavia the band 47-68 MHz, in Romania the band 47-58 MHz and in the Czech Republic the band 66-68 MHz, are also allocated to the land mobile service on a primary basis. However, stations of the land mobile service in the countries mentioned in connection with each band referred to in this footnote shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations of countries other than those mentioned in connection with the band.

NOC **S5.165** to **S5.173**

MOD **S5.174** *Alternative allocation:* in Bulgaria, Hungary, Poland and Romania, the band 68-73 MHz is allocated to the broadcasting service on a primary basis and used in accordance with the decisions in the Final Acts of the Special Regional Conference (Geneva, 1960).

NOC **S5.175** and **S5.176**

MOD **S5.177** *Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, Georgia, Kazakstan, Latvia, Lithuania, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Russia, Tajikistan, Turkmenistan and Ukraine, the band 73-74 MHz is also allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. **S9.21**.

NOC **S5.178** to **S5.180**

MOD **S5.181** *Additional allocation:* in Germany, Austria, Cyprus, Denmark, Egypt, France, Greece, Israel, Italy, Japan, Jordan, Lebanon, Malta, Morocco, Monaco, Norway, Syria, Sweden and Switzerland, the band 74.8-75.2 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **S9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. **S9.21**.

NOC **S5.182** and **S5.183**

MOD **S5.184** *Additional allocation:* in Bulgaria and Romania, the band 76-87.5 MHz is also allocated to the broadcasting service on a primary basis and used in accordance with the decisions contained in the Final Acts of the Special Regional Conference (Geneva, 1960).

NOC **S5.185**

SUP **S5.186**

NOC **S5.187** to **S5.189**

MOD **S5.190** *Additional allocation:* in Monaco, the band 87.5-88 MHz is also allocated to the land mobile service on a primary basis, subject to agreement obtained under No. **S9.21**.

NOC **S5.191**

MOD **S5.192** *Additional allocation:* in China and the Republic of Korea, the band 100-108 MHz is also allocated to the fixed and mobile services on a primary basis.

NOC **S5.193**

MOD **S5.194** *Additional allocation:* in Azerbaijan, Lebanon, Syria, Kyrgyzstan, Somalia and Turkmenistan, the band 104-108 MHz is also allocated to the mobile, except aeronautical mobile (R), service on a secondary basis.

NOC **S5.195** and **S5.196**

MOD **S5.197** *Additional allocation:* in Germany, Austria, Cyprus, Denmark, Egypt, France, Italy, Japan, Jordan, Lebanon, Malta, Morocco, Monaco, Norway, Pakistan, Syria, and Sweden, the band 108-111.975 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **S9.21**. In order to ensure that harmful interference is not caused to

stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedures invoked under No. **S9.21**.

MOD

MHz
75.2-137

Allocation to Services		
Region 1	Region 2	Region 3
117.975-136	AERONAUTICAL MOBILE (R) S5.111 S5.198 S5.199 S5.200 S5.201	
136-137	AERONAUTICAL MOBILE (R) S5.202 S5.203 S5.203A S5.203B	

MOD **S5.198** *Additional allocation:* the band 117.975-136 MHz is also allocated to the aeronautical mobile-satellite (R) service on a secondary basis, subject to agreement obtained under No. **S9.21**.

NOC **S5.199** and **S5.200**

MOD **S5.201** *Additional allocation:* in Angola, Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, Georgia, Hungary, the Islamic Republic of Iran, Iraq, Japan, Kazakstan, Latvia, Moldova, Mongolia, Mozambique, Uzbekistan, Papua New Guinea, Poland, Kyrgyzstan, Slovakia, the Czech Republic, Romania, Russia, Tajikistan, Turkmenistan and Ukraine, the band 132-136 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service.

MOD **S5.202** *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Belarus, Bulgaria, United Arab Emirates, Georgia, the Islamic Republic of Iran, Jordan, Kazakstan, Latvia, Moldova, Oman, Uzbekistan, Poland, Syria, Kyrgyzstan, Slovakia, the Czech Republic, Romania, Russia, Tajikistan, Turkmenistan, Turkey and Ukraine, the band 136-137 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service.

MOD **S5.203** In the band 136-137 MHz, existing operational meteorological satellites may continue to operate, under the conditions defined in No. **S4.4** with respect to the aeronautical mobile service, until 1 January 2002. Administrations shall not authorize new frequency assignments in this band to stations in the meteorological-satellite service.

ADD **S5.203A** *Additional allocation:* in Israel, Mauritania, Qatar and Zimbabwe, the band 136-137 MHz is also allocated to the fixed and mobile, except aeronautical mobile (R), services on a secondary basis until 1 January 2005.

ADD **S5.203B** *Additional allocation:* in Saudi Arabia, United Arab Emirates, Jordan, Oman and Syria, the band 136-137 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis until 1 January 2005.

NOC **S5.204** to **S5.207**

MOD **S5.208** The use of the band 137-138 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-97)**/No. **S9.11A**.

MOD **S5.208A** In making assignments to space stations in the mobile-satellite service in the bands 137-138 MHz, 387-390 MHz and 400.15-401 MHz, administrations shall take all practicable steps to protect the radio astronomy service in the bands 150.05-153 MHz, 322-328.6 MHz, 406.1-410 MHz and 608-614 MHz from harmful interference from unwanted emissions. The threshold levels of interference detrimental to the radio astronomy service are shown in Table 1 of Recommendation ITU-R RA.769-1.

MOD **S5.209** The use of the bands 137-138 MHz, 148-150.05 MHz, 399.9-400.05 MHz, 400.15-401 MHz, 454-456 MHz and 459-460 MHz by the mobile-satellite service is limited to non-geostationary-satellite systems.

MOD **S5.210** *Additional allocation:* in Austria, France, Italy, Liechtenstein, Slovakia, the Czech Republic, the United Kingdom and Switzerland, the bands 138-143.6 MHz and 143.65-144 MHz are also allocated to the space research service (space-to-Earth) on a secondary basis.

NOC **S5.211** to **S5.218**

(MOD) **S5.219** The use of the band 148-149.9 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-97)/** No. **S9.11A**. The mobile-satellite service shall not constrain the development and use of the fixed, mobile and space operation services in the band 148-149.9 MHz.

MOD

MHz
148-156.8375

Allocation to Services		
Region 1	Region 2	Region 3
149.9-150.05	MOBILE-SATELLITE (Earth-to-space) S5.209 S5.224A RADIONAVIGATION-SATELLITE S5.224B S5.220 S5.222 S5.223	

MOD **S5.220** The use of the bands 149.9-150.05 MHz and 399.9-400.05 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-97)**/No. **S9.11A**. The mobile-satellite service shall not constrain the development and use of the radionavigation-satellite service in the bands 149.9-150.05 MHz and 399.9-400.05 MHz.

MOD **S5.221** Stations of the mobile-satellite service in the band 148-149.9 MHz shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations in the following countries: Albania, Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bosnia and Herzegovina, Brunei Darussalam, Bulgaria, Cameroon, China, Cyprus, Congo, the Republic of Korea, Croatia, Cuba, Denmark, Egypt, the United Arab Emirates, Eritrea, Spain, Estonia, Ethiopia, Finland, France, Gabon, Ghana, Greece, Guinea, Guinea Bissau, Hungary, India, the Islamic Republic of Iran, Ireland, Iceland, Israel, Italy, Jamaica, Japan, Jordan, Kazakstan, Kenya, Kuwait, Latvia, The Former Yugoslav Republic of Macedonia, Lebanon, Libya, Liechtenstein, Luxembourg, Malaysia, Mali, Malta, Mauritania, Moldova, Mongolia, Mozambique, Namibia, Norway, New Zealand, Oman, Uganda, Uzbekistan, Pakistan, Panama, Papua New Guinea, Paraguay, the Netherlands, Philippines, Poland, Portugal, Qatar, Syria, Kyrgyzstan, Slovakia, Romania, the United Kingdom, Russia, Senegal, Sierra Leone, Singapore, Slovenia, Sri Lanka, South Africa, Sweden, Switzerland, Swaziland, Tanzania, Chad, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Ukraine, Viet Nam, Yemen, Yugoslavia, Zambia, and Zimbabwe.

NOC **S5.222** and **S5.223**

SUP **S5.224**

ADD **S5.224A** The use of the bands 149.9-150.05 MHz and 399.9-400.05 MHz by the mobile-satellite service (Earth-to-space) is limited to the land mobile-satellite service (Earth-to-space) until 1 January 2015.

ADD **S5.224B** The allocation of the bands 149.9-150.05 MHz and 399.9-400.05 MHz to the radionavigation-satellite service shall be effective until 1 January 2015.

NOC **S5.225** to **S5.236**

MOD **S5.237** *Additional allocation:* in the Congo, Eritrea, Ethiopia, Gambia, Guinea, Libya, Malawi, Mali, Senegal, Sierra Leone, Somalia, Tanzania and Zimbabwe, the band 174-223 MHz is also allocated to the fixed and mobile services on a secondary basis.

NOC **S5.238** to **S5.243**

SUP **S5.244**

NOC **S5.245** to **S5.258**

MOD **S5.259** *Additional allocation:* in Germany, Austria, Cyprus, the Republic of Korea, Denmark, Egypt, Spain, France, Greece, Israel, Italy, Japan, Jordan, Malta, Morocco, Monaco, Norway, the Netherlands, Syria and Sweden, the band 328.6-335.4 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **S9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. **S9.21**.

MOD

MHz
322-400.15

Allocation to Services		
Region 1	Region 2	Region 3
399.9-400.05	MOBILE-SATELLITE (Earth-to-space) S5.209 S5.224A RADIONAVIGATION-SATELLITE S5.222 S5.224B S5.260 S5.220	

NOC **S5.260** to **S5.264**

MOD

MHz
400.15-410

Allocation to Services		
Region 1	Region 2	Region 3
401-402	METEOROLOGICAL AIDS SPACE OPERATION (space-to-Earth) EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Fixed Mobile except aeronautical mobile	
402-403	METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Fixed Mobile except aeronautical mobile	

NOC **S5.265** to **S5.267**

MOD

MHz
410-450

Allocation to Services		
Region 1	Region 2	Region 3
410-420	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-space) S5.268	

MOD **S5.268** Use of the band 410-420 MHz by the space research service is limited to communications within 5 km of an orbiting, manned space vehicle. The power flux-density at the surface of the Earth produced by emissions from extra-vehicular activities shall not exceed –153 dB(W/m^2) for $0° \leq \delta \leq 5°$, $-153 + 0.077\ (\delta - 5)$ dB(W/m^2) for $5° \leq \delta \leq 70°$ and –148 dB(W/m^2) for $70° \leq \delta \leq 90^o$, where δ is the angle of arrival of the radio-frequency wave and the reference bandwidth is 4 kHz. No. **S4.10** does not apply to extra-vehicular activities. In this frequency band the space research (space-to-space) service shall not claim protection from, nor constrain the use and development of, stations of the fixed and mobile services.

NOC **S5.269** and **S5.270**

MOD **S5.271** *Additional allocation:* in Azerbaijan, Belarus, China, Estonia, India, Latvia, Lithuania, Kyrgyzstan, Turkmenistan and Ukraine, the band 420-460 MHz is also allocated to the aeronautical radionavigation service (radio altimeters) on a secondary basis.

NOC **S5.272** to **S5.274**

MOD **S5.275** *Additional allocation:* in Bosnia and Herzegovina, Croatia, Estonia, Finland, Latvia, The Former Yugoslav Republic of Macedonia, Libya, Slovenia and Yugoslavia, the bands 430-432 MHz and 438-440 MHz are also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

MOD **S5.276** *Additional allocation:* in Afghanistan, Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burkina Faso, Burundi, Egypt, the United Arab Emirates, Ecuador, Eritrea, Ethiopia, Greece, Guinea, India, Indonesia, the Islamic Republic of Iran, Iraq, Israel, Italy, Jordan, Kenya, Kuwait, Lebanon, Libya, Liechtenstein, Malaysia, Malta, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syria, Democratic People's Republic of Korea, Singapore, Somalia, Switzerland, Tanzania, Thailand, Togo, Turkey and Yemen, the band 430-440 MHz is also allocated to the fixed service on a primary basis and the bands 430-435 MHz and 438-440 MHz are also allocated to the mobile, except aeronautical mobile, service on a primary basis.

MOD **S5.277** *Additional allocation:* in Angola, Armenia, Azerbaijan, Belarus, Cameroon, the Congo, Djibouti, Gabon, Georgia, Hungary, Kazakstan, Latvia, Mali, Moldova, Mongolia, Uzbekistan, Pakistan, Poland, Kyrgyzstan, Slovakia, the Czech Republic, Romania, Russia, Rwanda, Tajikistan, Chad, Turkmenistan and Ukraine, the band 430-440 MHz is also allocated to the fixed service on a primary basis.

NOC **S5.278** to **S5.286**

MOD

MHz
450-460

Allocation to Services		
Region 1	Region 2	Region 3
450-455 FIXED MOBILE S5.209 S5.271 S5.286 S5.286A S5.286B S5.286C S5.286D S5.286E		
455-456 FIXED MOBILE S5.209 S5.271 S5.286A S5.286B S5.286C S5.286E	**455-456** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) S5.209 S5.271 S5.286A S5.286B S5.286C	**455-456** FIXED MOBILE S5.209 S5.271 S5.286A S5.286B S5.286C S5.286E
456-459 FIXED MOBILE S5.271 S5.287 S5.288		
459-460 FIXED MOBILE S5.209 S5.271 S5.286A S5.286B S5.286C S5.286E	**459-460** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) S5.209 S5.271 S5.286A S5.286B S5.286C	**459-460** FIXED MOBILE S5.209 S5.271 S5.286A S5.286B S5.286C S5.286E

MOD **S5.286A** The use of the bands 454-456 MHz and 459-460 MHz by the mobile-satellite service is subject to coordination under Resolution **46 (Rev.WRC-97)**/No. **S9.11A**.

MOD **S5.286B** The use of the band 454-455 MHz in the countries listed in No. **S5.286D**, 455-456 MHz and 459-460 MHz in Region 2, and 454-456 MHz and 459-460 MHz in the countries listed in No. **S5.286E**, by stations in the mobile-satellite service, shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations.

MOD **S5.286C** The use of the band 454-455 MHz in the countries listed in No. **S5.286D**, 455-456 MHz and 459-460 MHz in Region 2, and 454-456 MHz and 459-460 MHz in the countries listed in No. **S5.286E**, by stations in the mobile-satellite service, shall not constrain the development and use of the fixed and mobile services operating in accordance with the Table of Frequency Allocations.

ADD **S5.286D** *Additional allocation:* in Canada, the United States, Mexico and Panama, the band 454-455 MHz is also allocated to the mobile-satellite service (Earth-to-space) on a primary basis.

ADD **S5.286E** *Additional allocation:* in Cape Verde, Indonesia, Nepal, Nigeria and Papua New Guinea, the bands 454-456 MHz and 459-460 MHz are also allocated to the mobile-satellite (Earth-to-space) service on a primary basis.

MOD **S5.287** In the maritime mobile service, the frequencies 457.525 MHz, 457.550 MHz, 457.575 MHz, 467.525 MHz, 467.550 MHz and 467.575 MHz may be used by on-board communication stations. Where needed, equipment designed for 12.5 kHz channel spacing using also the additional frequencies 457.5375 MHz, 457.5625 MHz, 467.5375 MHz and 467.5625 MHz may be introduced for on-board communications. The use of these frequencies in territorial waters may be subject to the national regulations of the administration concerned. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174 (see Resolution **341 (WRC-97)**).

NOC **S5.288** and **S5.289**

MOD **S5.290** *Different category of service:* in Afghanistan, Armenia, Azerbaijan, Belarus, China, Japan, Kazakstan, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Republic, Russia, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 460-470 MHz to the meteorological-satellite service (space-to-Earth) is on a primary basis (see No. **S5.33**), subject to agreement obtained under No. **S9.21**.

MOD

MHz
470-890

<table>
<tr><td colspan="3">Allocation to Services</td></tr>
<tr><td>Region 1</td><td>Region 2</td><td>Region 3</td></tr>
<tr><td rowspan="2">470-790
BROADCASTING

S5.149 S5.291A S5.294
S5.296 S5.300 S5.302
S5.304 S5.306 S5.311
S5.312</td><td>470-512
BROADCASTING
Fixed
Mobile
S5.292 S5.293</td><td>470-585
FIXED
MOBILE
BROADCASTING

S5.291 S5.298</td></tr>
<tr><td colspan="2"></td></tr>
</table>

NOC **S5.291**

ADD **S5.291A** *Additional allocation:* in Germany, Austria, Denmark, Estonia, Finland, Liechtenstein, Norway, Netherlands, the Czech Republic and Switzerland, the band 470-494 MHz is also allocated to the radiolocation service on a secondary basis. This use is limited to the operation of wind profiler radars in accordance with Resolution **217 (WRC-97)**.

NOC **S5.292** to **S5.295**

MOD **S5.296** *Additional allocation:* in Germany, Austria, Belgium, Cyprus, Denmark, Spain, Finland, France, Ireland, Israel, Italy, Libya, Malta, Morocco, Monaco, Norway, the Netherlands, Portugal, Syria, the United Kingdom, Sweden, Switzerland, Swaziland and Tunisia, the band 470-790 MHz is also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting. Stations of the land mobile service in the countries listed in this footnote shall not cause harmful interference to existing or planned stations operating in accordance with the Table of Frequency Allocations in countries other than those listed in this footnote.

NOC **S5.297** to **S5.309**

SUP **S5.310**

NOC **S5.311**

MOD **S5.312** *Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Hungary, Kazakstan, Latvia, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Republic, Romania, Russia, Tajikistan, Turkmenistan and Ukraine, the band 645-862 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

SUP **S5.313**

MOD **S5.314** *Additional allocation:* in Austria, Italy, Uzbekistan, the United Kingdom and Swaziland, the band 790-862 MHz is also allocated to the land mobile service on a secondary basis.

NOC **S5.315**

MOD **S5.316** *Additional allocation:* in Germany, Bosnia and Herzegovina, Burkina Faso, Cameroon, Côte d'Ivoire, Croatia, Denmark, Egypt, Finland, Israel, Kenya, the Former Yugoslav Republic of Macedonia, Libya, Liechtenstein, Monaco, Norway, the Netherlands, Portugal, Syria, Sweden, Switzerland and Yugoslavia, the band 790-830 MHz, and in these same countries and in Spain, France, Gabon and Malta, the band 830-862 MHz, are also allocated to the mobile, except aeronautical mobile, service on a primary basis. However, stations of the mobile service in the countries mentioned in connection with each band referred to in this footnote shall not cause harmful interference to, or claim protection from, stations of services operating in accordance with the Table in countries other than those mentioned in connection with the band.

NOC **S5.317** to **S5.321**

MOD **S5.322** In Region 1, in the band 862-960 MHz, stations of the broadcasting service shall be operated only in the African Broadcasting Area (see Nos. **S5.10** to **S5.13**) excluding Algeria, Egypt, Spain, Libya, Morocco, Nigeria, South Africa, Tanzania and Zimbabwe, subject to agreement obtained under No. **S9.21**.

MOD **S5.323** *Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, Hungary, Kazakstan, Latvia, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Republic, Romania, Russia, Tajikistan, Turkmenistan and Ukraine, the band 862-960 MHz is also allocated to the aeronautical radionavigation service on a primary basis. Such use is subject to agreement obtained under No. **S9.21** with administrations concerned and limited to ground-based radiobeacons in operation on 27 October 1997 until the end of their lifetime.

NOC **S5.324** to **S5.328**

MOD

MHz
890-1 240

Allocation to Services		
Region 1	Region 2	Region 3
1 215-1 240	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) SPACE RESEARCH (active) S5.329 S5.330 S5.331 S5.332	

NOC **S5.329**

MOD **S5.330** *Additional allocation:* in Angola, Saudi Arabia, Bahrain, Bangladesh, Cameroon, China, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, the Islamic Republic of Iran, Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Libya, Morocco, Mozambique, Nepal, Nigeria, Pakistan, the Philippines, Qatar, Syria, Somalia, Sudan, Sri Lanka, Chad, Togo and Yemen, the band 1 215-1 300 MHz is also allocated to the fixed and mobile services on a primary basis.

NOC **S5.331**

ADD **S5.332** In the band 1 215-1 300 MHz, active spaceborne sensors in the earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service, the radio-navigation-satellite service and other services allocated on a primary basis.

SUP **S5.333**

MOD

MHz
1 240-1 452

Allocation to Services		
Region 1	Region 2	Region 3
1 240-1 260	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) SPACE RESEARCH (active) Amateur S5.329 S5.330 S5.331 S5.332 S5.334 S5.335	
1 260-1 300	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) Amateur S5.282 S5.330 S5.331 S5.332 S5.334 S5.335	

NOC **S5.334**

ADD **S5.335** In Canada and the United States in the band 1 240-1 300 MHz, active spaceborne sensors in the earth exploration-satellite and space research services shall not cause interference to, claim protection from, or otherwise impose constraints on operation or development of the aeronautical radionavigation service.

NOC **S5.336** and **S5.337**

MOD **S5.338** In Azerbaijan, Bulgaria, Mongolia, Poland, Kyrgyzstan, Slovakia, the Czech Republic, Romania, Turkmenistan and Ukraine, existing installations of the radionavigation service may continue to operate in the band 1 350-1 400 MHz.

NOC **S5.339**

MOD **S5.340** All emissions are prohibited in the following bands:

1 400-1 427 MHz,	
2 690-2 700 MHz	except those provided for by Nos. **S5.421** and **S5.422**,
10.68-10.7 GHz	except those provided for by No. **S5.483**,
15.35-15.4 GHz	except those provided for by No. **S5.511**,
23.6-24 GHz,	
31.3-31.5 GHz,	
31.5-31.8 GHz	in Region 2,
48.94-49.04 GHz	from airborne stations,
50.2-50.4 GHz[1]	except those provided for by No. **S5.555A**,
52.6-54.25 GHz,	
86-92 GHz,	
105-116 GHz,	
140.69-140.98 GHz	from airborne stations and from space stations in the space-to-Earth direction,
182-185 GHz	except those provided for by No. **S5.563**,
217-231 GHz.	

ADD **S5.340.1** [1] The allocation to the earth exploration-satellite service (passive) and the space research service (passive) in the band 50.2-50.4 GHz should not impose undue constraints on the use of the adjacent bands by the primary allocated services in those bands.

NOC **S5.341** to **S5.346**

MOD **S5.347** *Different category of service:* in Bangladesh, Bosnia and Herzegovina, Botswana, Bulgaria, Burkina Faso, Cuba, Denmark, Egypt, Greece, Ireland, Italy, Jordan, Kenya, Mozambique, Portugal, Sri Lanka, Swaziland, Yemen, Yugoslavia and Zimbabwe, the allocation of the band 1 452-1 492 MHz to the broadcasting-satellite service and the broadcasting service is on a secondary basis until 1 April 2007.

NOC **S5.348**

MOD

MHz
1 452-1 530

Allocation to Services		
Region 1	Region 2	Region 3
1 525-1 530	**1 525-1 530**	**1 525-1 530**
SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)	SPACE OPERATION (space-to-Earth)
FIXED	MOBILE-SATELLITE (space-to-Earth)	FIXED
MOBILE-SATELLITE (space-to-Earth)	Earth Exploration-Satellite	MOBILE-SATELLITE (space-to-Earth)
Earth Exploration-Satellite	Fixed	Earth Exploration-Satellite
Mobile except aeronautical mobile S5.349	Mobile S5.343	Mobile S5.349
S5.341 S5.342 S5.350 S5.351 S5.352A S5.354	S5.341 S5.351 S5.354	S5.341 S5.351 S5.352A S5.354

MOD **S5.349** *Different category of service:* in Saudi Arabia, Azerbaijan, Bahrain, Bosnia and Herzegovina, Cameroon, Egypt, the United Arab Emirates, France, the Islamic Republic of Iran, Iraq, Israel, Kazakstan, Kuwait, The Former Yugoslav Republic of Macedonia, Lebanon, Morocco, Mongolia, Oman, Qatar, Syria, Kyrgyzstan, Romania, Turkmenistan, Ukraine, Yemen and Yugoslavia, the allocation of the band 1 525-1 530 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. **S5.33**).

MOD **S5.350** *Additional allocation:* in Azerbaijan, Kyrgyzstan, Turkmenistan and Ukraine, the band 1 525-1 530 MHz is also allocated to the aeronautical mobile service on a primary basis.

NOC **S5.351**

SUP **S5.352**

ADD **S5.352A** In the band 1 525-1 530 MHz, stations in the mobile-satellite service, except stations in the maritime mobile-satellite service, shall not cause harmful interference to, or claim protection from, stations of the fixed service in France and French overseas territories in Region 3, Algeria, Saudi Arabia, Egypt, Guinea, India, Israel, Italy, Jordan, Kuwait, Mali, Malta, Morocco, Mauritania, Nigeria, Oman, Pakistan, Philippines, Qatar, Syria, Tanzania, Viet Nam and Yemen notified prior to 1 April 1998.

MOD

MHz
1 530-1 535

Allocation to Services		
Region 1	Region 2	Region 3
1 530-1 533 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) S5.353A Earth Exploration-Satellite Fixed Mobile except aeronautical mobile S5.341 S5.342 S5.351 S5.354	**1 530-1 533** SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) S5.353A Earth Exploration-Satellite Fixed Mobile S5.343 S5.341 S5.351 S5.354	
1 533-1 535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) S5.353A Earth Exploration-Satellite Fixed Mobile except aeronautical mobile S5.341 S5.342 S5.351 S5.354	**1 533-1 535** SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) S5.353A Earth Exploration-Satellite Fixed Mobile S5.343 S5.341 S5.351 S5.354	

SUP **S5.353**

ADD **S5.353A** In applying the procedures of No. **S9.11A** to the mobile-satellite service in the bands 1 530-1 544 MHz and 1 626.5-1 645.5 MHz, priority shall be given to accommodating the spectrum requirements for distress, urgency and safety communications of the Global Maritime Distress and Safety System (GMDSS). Maritime mobile-satellite distress, urgency and safety communications shall have priority access and immediate availability over all other mobile satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, distress, urgency and safety communications of the GMDSS. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (See Resolution **218 (WRC-97)**.)

NOC **S5.354**

MOD

MHz
1 535-1 610.6

Allocation to Services		
Region 1	Region 2	Region 3
1 535-1 544	MOBILE-SATELLITE (space-to-Earth) S5.341 S5.351 S5.353A S5.354 S5.355	
1 544-1 545	MOBILE-SATELLITE (space-to-Earth) S5.341 S5.354 S5.355 S5.356	
1 545-1 555	MOBILE-SATELLITE (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.357 S5.357A S5.359	
1 555-1 559	MOBILE-SATELLITE (space-to-Earth) S5.341 S5.351 S5.354 S5.355 S5.359 S5.362A	

MOD **S5.355** *Additional allocation:* in Bahrain, Bangladesh, the Congo, Egypt, the United Arab Emirates, Eritrea, Ethiopia, the Islamic Republic of Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Malta, Morocco, Oman, Qatar, Syria, Somalia, Sudan, Sri Lanka, Chad, Togo, Yemen and Zambia, the bands 1 540-1 645.5 MHz and 1 646.5-1 660 MHz are also allocated to the fixed service on a secondary basis.

NOC **S5.356** and **S5.357**

ADD **S5.357A** In applying the procedures of No. **S9.11A** to the mobile-satellite service in the bands 1 545-1 555 MHz and 1 646.5-1 656.5 MHz, priority shall be given to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service providing transmission of messages with priority 1 to 6 in Article **S44**. Aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **S44** shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **S44**. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (See Resolution **218 (WRC-97)**.)

SUP **S5.358**

NOC **S5.359**

SUP **S5.360** to **S5.362**

ADD **S5.362A** In the United States, in the bands 1 555-1 559 MHz and 1 656.5-1 660.5 MHz, the aeronautical mobile-satellite (R) service shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **S44**. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services.

NOC **S5.363** to **S5.368**

MOD **S5.369** *Different category of service:* in Angola, Australia, Burundi, China, Côte d'Ivoire, Eritrea, Ethiopia, India, the Islamic Republic of Iran, Israel, Jordan, Lebanon, Liberia, Libya, Madagascar, Mali, Pakistan, Papua New Guinea, Syria, Senegal, Sudan, Swaziland, Togo, Zaire and Zambia, the allocation of the band 1 610-1 626.5 MHz to the radiodetermination-satellite service (Earth-to-space) is on a primary basis (see No. **S5.33**), subject to agreement obtained under No. **S9.21** from countries not listed in this provision.

MOD

MHz
1 610.6-1 631.5

Allocation to Services		
Region 1	Region 2	Region 3
1 626.5-1 631.5	MOBILE-SATELLITE (Earth-to-space) S5.341 S5.351 S5.353A S5.354 S5.355 S5.359	

NOC **S5.370** to **S5.373**
SUP **S5.373A**

MOD

MHz
1 631.5-1 670

Allocation to Services		
Region 1	Region 2	Region 3
1 631.5-1 636.5	MOBILE-SATELLITE (Earth-to-space) S5.341 S5.351 S5.353A S5.354 S5.355 S5.359 S5.374	
1 636.5-1 645.5	MOBILE-SATELLITE (Earth-to-space) S5.341 S5.351 S5.353A S5.354 S5.355 S5.359	
1 645.5-1 646.5	MOBILE-SATELLITE (Earth-to-space) S5.341 S5.354 S5.375	
1 646.5-1 656.5	MOBILE-SATELLITE (Earth-to-space) S5.341 S5.351 S5.354 S5.355 S5.357A S5.359 S5.376	
1 656.5-1 660	MOBILE-SATELLITE (Earth-to-space) S5.341 S5.351 S5.354 S5.355 S5.359 S5.362A S5.374	
1 660-1 660.5	MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY S5.149 S5.341 S5.351 S5.354 S5.362A S5.376A	

MOD **S5.374** Mobile earth stations in the mobile-satellite service operating in the bands 1 631.5-1 634.5 MHz and 1 656.5-1 660 MHz shall not cause harmful interference to stations in the fixed service operating in the countries listed in No. **S5.359**.

NOC **S5.375** and **S5.376**

ADD **S5.376A** Mobile earth stations operating in the band 1 660-1 660.5 MHz shall not cause harmful interference to stations in the radio astronomy service.

NOC **S5.377** to **S5.380**

MOD **S5.381** *Additional allocation:* in Afghanistan, Costa Rica, Cuba, India, the Islamic Republic of Iran, Malaysia, Pakistan and Sri Lanka, the band 1 690-1 700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

MOD **S5.382** *Different category of service:* in Saudi Arabia, Armenia, Austria, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Bulgaria, the Congo, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guinea, Hungary, Iraq, Israel, Jordan, Kazakstan, Kuwait, the Former Yugoslav Republic of Macedonia, Lebanon, Mauritania, Moldova, Mongolia, Oman, Uzbekistan, Poland, Qatar, Syria, Kyrgyzstan, Romania, Russia, Somalia, Tajikistan, Tanzania, Turkmenistan, Ukraine, Yemen and Yugoslavia, the allocation of the band 1 690-1 700 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. **S5.33**), and in the Democratic People's Republic of Korea, the allocation of the band 1 690-1 700 MHz to the fixed service is on a primary basis (see No. **S5.33**) and to the mobile, except aeronautical mobile, service on a secondary basis.

S5.383 Not used.

MOD **S5.384** *Additional allocation:* in India, Indonesia and Japan, the band 1 700-1 710 MHz is also allocated to the space research service (space-to-Earth) on a primary basis.

NOC **S5.385** and **S5.386**

MOD **S5.387** *Additional allocation:* in Armenia, Azerbaijan, Belarus, Georgia, Kazakstan, Mali, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Republic, Romania, Russia, Tajikistan, Turkmenistan and Ukraine, the band 1 770-1 790 MHz is also allocated to the meteorological-satellite service on a primary basis, subject to agreement obtained under No. **S9.21**.

MOD **S5.388** The bands 1 885-2 025 MHz and 2 110-2 200 MHz are intended for use, on a worldwide basis, by administrations wishing to implement International Mobile Telecommunications-2000 (IMT-2000). Such use does not preclude the use of these bands by other services to which they are allocated. The bands should be made available for IMT-2000 in accordance with Resolution **212 (Rev.WRC-97)**.

MOD

MHz
2 010-2 170

Allocation to Services		
Region 1	Region 2	Region 3
2 010-2 025 FIXED MOBILE S5.388	**2 010-2 025** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) S5.388 S5.389C S5.389D S5.389E S5.390	**2 010-2 025** FIXED MOBILE S5.388
…		
2 160-2 170 FIXED MOBILE S5.388 S5.392A	**2 160-2 170** FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) S5.388 S5.389C S5.389D S5.389E S5.390	**2 160-2 170** FIXED MOBILE S5.388

NOC **S5.389** to **S5.389B**

MOD **S5.389C** The use of the bands 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2 by the mobile-satellite service shall not commence before 1 January 2002 and is subject to coordination under Resolution **46 (Rev.WRC-97)**/No. **S9.11A** and to the provisions of Resolution **716 (WRC-95)**.

NOC **S5.389D** to **S5.389F**

ADD **S5.390** In Argentina, Brazil, Chile, Colombia, Cuba, Ecuador and Suriname, the use of the bands 2 010-2 025 MHz and 2 160-2 170 MHz by the mobile-satellite services shall not cause harmful interference to stations in the fixed and mobile services before 1 January 2005. After this date, the use of these bands is subject to coordination under Resolution **46 (Rev.WRC-97)**/No. **S9.11A** and to the provisions of Resolution **716 (WRC-95)**.

MOD **S5.391** In making assignments to the mobile service in the bands 2 025-2 110 MHz and 2 200-2 290 MHz, administrations shall not introduce high-density mobile systems, as described in Recommendation ITU-R SA.1154, and shall take that Recommendation into account for the introduction of any other type of mobile system.

NOC **S5.392** and **S5.392A**

MOD **S5.393** *Additional allocation:* in the United States, India and Mexico, the band 2 310-2 360 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial sound broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (WARC-92)**.

NOC **S5.394** to **S5.399**

MOD **S5.400** *Different category of service:* in Angola, Australia, Bangladesh, Burundi, China, Eritrea, Ethiopia, India, the Islamic Republic of Iran, Jordan, Lebanon, Liberia, Libya, Madagascar, Mali, Pakistan, Papua New Guinea, Syria, Sudan, Swaziland, Togo, Zaire and Zambia, the allocation of the band 2 483.5-2 500 MHz to the radiodetermination-satellite service (space-to-Earth) is on a primary basis (see No. **S5.33**), subject to agreement obtained under No. **S9.21** from countries not listed in this provision.

MOD

MHz
2 450-2 520

Allocation to Services		
Region 1	Region 2	Region 3
2 500-2 520 FIXED S5.409 S5.410 S5.411 MOBILE except aeronautical mobile MOBILE-SATELLITE (space-to-Earth) S5.403 S5.405 S5.407 S5.408 S5.412 S5.414	**2 500-2 520** FIXED S5.409 S5.411 FIXED-SATELLITE (space-to-Earth) S5.415 MOBILE except aeronautical mobile MOBILE-SATELLITE (space-to-Earth) S5.403 S5.404 S5.407 S5.414	**2 500-2 520** FIXED S5.409 S5.411 FIXED-SATELLITE (space-to-Earth) S5.415 MOBILE except aeronautical mobile MOBILE-SATELLITE (space-to-Earth) S5.403 S5.404 S5.407 S5.414 S5.415A

NOC **S5.401** to **S5.411**

MOD **S5.412** *Alternative allocation:* in Azerbaijan, Bulgaria, Kyrgyzstan, Turkmenistan and Ukraine, the band 2 500-2 690 MHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

NOC **S5.413** to **S5.415**

ADD **S5.415A** *Additional allocation*: in Japan, subject to agreement obtained under No. **S9.21**, the band 2 515-2 535 MHz may also be used for the aeronautical mobile-satellite service (space-to-Earth) for operation limited to within its national boundary from 1 January 2000.

MOD

MHz
2 520-2 670

Allocation to Services		
Region 1	Region 2	Region 3
2 520-2 655 FIXED S5.409 S5.410 S5.411 MOBILE except aeronautical mobile BROADCASTING-SATELLITE S5.413 S5.416	**2 520-2 655** FIXED S5.409 S5.411 FIXED-SATELLITE (space-to-Earth) S5.415 MOBILE except aeronautical mobile BROADCASTING-SATELLITE S5.413 S5.416	**2 520-2 535** FIXED S5.409 S5.411 FIXED-SATELLITE (space-to-Earth) S5.415 MOBILE except aeronautical mobile BROADCASTING-SATELLITE S5.413 S5.416 S5.403 S5.415A
		2 535-2 655 FIXED S5.409 S5.411 MOBILE except aeronautical mobile BROADCASTING-SATELLITE S5.413 S5.416
S5.339 S5.403 S5.405 S5.408 S5.412 S5.417 S5.418	S5.339 S5.403	S5.339 S5.418

MOD

MHz
2 670-3 300

Allocation to Services		
Region 1	Region 2	Region 3
2 670-2 690 FIXED S5.409 S5.410 S5.411 MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) S5.149 S5.419 S5.420	**2 670-2 690** FIXED S5.409 S5.411 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) S5.415 MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) S5.149 S5.419 S5.420	**2 670-2 690** FIXED S5.409 S5.411 FIXED-SATELLITE (Earth-to-space) S5.415 MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) S5.149 S5.419 S5.420 S5.420A
. . .		
3 100-3 300	RADIOLOCATION Earth Exploration-Satellite (active) Space Research (active) S5.149 S5.428	

NOC **S5.416** to **S5.420**

ADD **S5.420A** *Additional allocation:* in Japan, subject to agreement obtained under No. **S9.21**, the band 2 670-2 690 MHz may also be used for the aeronautical mobile-satellite service (Earth-to-space) for operation limited to within its national boundary from 1 January 2000.

NOC **S5.421**

MOD **S5.422** *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Brunei Darussalam, the Central African Republic, the Congo, Côte d'Ivoire, Cuba, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Georgia, Guinea, Guinea-Bissau, the Islamic Republic of Iran, Iraq, Israel, Jordan, Kazakstan, Lebanon, Malaysia, Mali, Morocco, Mauritania, Moldova, Mongolia, Nigeria, Oman, Uzbekistan, Pakistan, the Philippines, Qatar, Syria, Kyrgyzstan, Romania, Russia, Somalia, Tajikistan, Tunisia, Turkmenistan, Ukraine, Yemen, Yugoslavia, Zaire and Zambia, the band 2 690-2 700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985.

NOC **S5.423** to **S5.427**

MOD **S5.428** *Additional allocation:* in Azerbaijan, Bulgaria, Cuba, Kazakstan, Mongolia, Poland, Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 3 100-3 300 MHz is also allocated to the radionavigation service on a primary basis.

MOD **S5.429** *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, China, the Congo, the Republic of Korea, the United Arab Emirates, India, Indonesia, the Islamic Republic of Iran, Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Libya, Malaysia, Oman, Pakistan, Qatar, Syria, Democratic People's Republic of Korea and Yemen, the band 3 300-3 400 MHz is also allocated to the fixed and mobile services on a primary basis. The countries bordering the Mediterranean shall not claim protection for their fixed and mobile services from the radiolocation service.

MOD **S5.430** *Additional allocation:* in Azerbaijan, Bulgaria, Cuba, Mongolia, Poland, Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 3 300-3 400 MHz is also allocated to the radionavigation service on a primary basis.

NOC **S5.431**

MOD **S5.432** *Different category of service:* in the Republic of Korea, Indonesia, Japan and Pakistan, the allocation of the band 3 400-3 500 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. **S5.33**).

NOC **S5.433**

SUP **S5.434**

NOC **S5.435** and **S5.436**

MOD **S5.437** *Additional allocation:* in Germany and Norway, the band 4 200-4 210 MHz is also allocated to the fixed service on a secondary basis.

NOC **S5.438**

MOD **S5.439** *Additional allocation:* in China, the Islamic Republic of Iran and Libya, the band 4 200-4 400 MHz is also allocated to the fixed service on a secondary basis.

NOC **S5.440**

MOD **S5.441** The use of the bands 4 500-4 800 MHz (space-to-Earth), 6 725-7 025 MHz (Earth-to-space) by the fixed-satellite service shall be in accordance with the provisions of Appendix **S30B**. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by geostationary-satellite systems in the fixed-satellite service shall be in accordance with the provisions of Appendix **S30B**. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by non-geostationary-satellite systems in the fixed-satellite service shall be in accordance with the provisions of Resolution **130 (WRC-97)**.

NOC **S5.442** to **S5.447C**

MOD

MHz
4 500-5 470

Allocation to Services		
Region 1	Region 2	Region 3
5 250-5 255	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH S5.447D S5.448 S5.448A	
5 255- 5 350	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) S5.448 S5.448A	
5 350-5 460	EARTH EXPLORATION-SATELLITE (active) AERONAUTICAL RADIONAVIGATION S5.449 Radiolocation S5.448B	

ADD **S5.447D** The allocation of the band 5 250-5 255 MHz to the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the band by the space research service are on a secondary basis.

MOD **S5.448** *Additional allocation:* in Austria, Azerbaijan, Bulgaria, Libya, Mongolia, Kyrgyzstan, Slovakia, the Czech Republic, Romania, Turkmenistan and Ukraine, the band 5 250-5 350 MHz is also allocated to the radionavigation service on a primary basis.

ADD **S5.448A** The use of the frequency band 5 250-5 350 MHz by the earth exploration-satellite (active) and space research (active) services shall not constrain the future development and deployment of the radiolocation service.

ADD **S5.448B** The earth exploration-satellite (active) service operating in the band 5 350-5 460 MHz shall not cause harmful interference to, or constrain the use and development of, the aeronautical radionavigation service.

NOC **S5.449**

MOD **S5.450** *Additional allocation:* in Austria, Azerbaijan, Bulgaria, the Islamic Republic of Iran, Mongolia, Kyrgyzstan, Slovakia, the Czech Republic, Romania, Turkmenistan and Ukraine, the band 5 470-5 650 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

NOC **S5.451** and **S5.452**

MOD **S5.453** *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, the Central African Republic, China, the Congo, the Republic of Korea, Egypt, the United Arab Emirates, Gabon, Guinea, India, Indonesia, the Islamic Republic of Iran, Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Libya, Madagascar, Malaysia, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syria, Democratic People's Republic of Korea, Singapore, Swaziland, Tanzania, Chad, and Yemen, the band 5 650-5 850 MHz is also allocated to the fixed and mobile services on a primary basis.

MOD **S5.454** *Different category of service:* in Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Kazakstan, Mongolia, Uzbekistan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 5 670-5 725 MHz to the space research service is on a primary basis (see No. **S5.33**).

NOC **S5.455** to **S5.458**

MOD **S5.459** *Additional allocation:* in Russia, the frequency bands 7 100-7 155 MHz and 7 190-7 235 MHz are also allocated to the space operation service (Earth-to-space) on a primary basis, subject to agreement obtained under No. **S9.21**.

NOC **S5.460** and **S5.461**

MOD

MHz
7 450-8 175

Allocation to Services		
Region 1	Region 2	Region 3
7 450-7 550	FIXED FIXED-SATELLITE (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile S5.461A	
7 550-7 750	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	
7 750-7 850	FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) S5.461B MOBILE except aeronautical mobile	
7 850-7 900	FIXED MOBILE except aeronautical mobile	
. . .		
8 025-8 175	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE S5.462A S5.463	

ADD **S5.461A** The use of the band 7 450-7 550 MHz by the meteorological-satellite service (space-to-Earth) is limited to geostationary-satellite systems. Non-geostationary meteorological-satellite systems in this band notified before 30 November 1997 may continue to operate on a primary basis until the end of their lifetime.

ADD **S5.461B** The use of the band 7 750-7 850 MHz by the meteorological-satellite service (space-to-Earth) is limited to non-geostationary satellite systems.

NOC **S5.462**

ADD **S5.462A** In Regions 1 and 3 (except for Japan), in the band 8 025-8 400 MHz, the earth exploration-satellite service using geostationary satellites shall not produce a power flux-density in excess of the following provisional values for angles of arrival (θ), without the consent of the affected administration:

-174 dB(W/m^2) in a 4 kHz band for $0° \leq \theta < 5°$

$-174 + 0.5\ (\theta - 5)$ dB(W/m^2) in a 4 kHz band for $5° \leq \theta < 25°$

-164 dB(W/m^2) in a 4 kHz band for $25° \leq \theta \leq 90°$

These values are subject to study under Resolution **124 (WRC-97)**.

MOD **S5.463** Aircraft stations are not permitted to transmit in the band 8 025-8 400 MHz.

SUP **S5.464**

MOD

MHz
8 175-8 750

Allocation to Services		
Region 1	Region 2	Region 3
8 175-8 215	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) MOBILE S5.462A S5.463	
8 215-8 400	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE S5.462A S5.463	
. . .		
8 500-8 550	RADIOLOCATION S5.468 S5.469	
8 550-8 650	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) S5.468 S5.469 S5.469A	
8 650-8 750	RADIOLOCATION S5.468 S5.469	

NOC **S5.465**

MOD **S5.466** *Different category of service:* in Israel, Malaysia, Singapore and Sri Lanka, the allocation of the band 8 400-8 500 MHz to the space research service is on a secondary basis (see No. **S5.32**).

NOC **S5.467**

MOD **S5.468** *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burundi, Cameroon, China, the Congo, Costa Rica, Egypt, the United Arab Emirates, Gabon, Guyana, Indonesia, the Islamic Republic of Iran, Iraq, Jamaica, Jordan, Kuwait, Lebanon, Libya, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, Qatar, Syria, Democratic People's Republic of Korea, Senegal, Singapore, Somalia, Swaziland, Tanzania, Chad, Togo, Tunisia and Yemen, the band 8 500-8 750 MHz is also allocated to the fixed and mobile services on a primary basis.

NOC **S5.469**

ADD **S5.469A** In the band 8 550-8 650 MHz, stations in the earth exploration-satellite service (active) and space research service (active) shall not cause harmful interference to, or constrain the use and development of, stations of the radiolocation service.

MOD

MHz
8 750-10 000

Allocation to Services		
Region 1	Region 2	Region 3
9 500-9 800	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION SPACE RESEARCH (active) S5.476A	

NOC **S5.470** to **S5.476**

ADD **S5.476A** In the band 9 500-9 800 MHz, stations in the earth exploration-satellite service (active) and space research service (active) shall not cause harmful interference to, or constrain the use and development of, stations of the radionavigation and radiolocation services.

MOD **S5.477** *Different category of service:* in Algeria, Saudi Arabia, Austria, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, the Republic of Korea, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, the Islamic Republic of Iran, Iraq, Jamaica, Japan, Jordan, Kuwait, Lebanon, Liberia, Malaysia, Nigeria, Oman, Pakistan, Qatar, Democratic People's Republic of Korea, Singapore, Somalia, Sudan, Sweden, Trinidad and Tobago, and Yemen, the allocation of the band 9 800-10 000 MHz to the fixed service is on a primary basis (see No. **S5.33**).

MOD **S5.478** *Additional allocation:* in Azerbaijan, Bulgaria, Kazakstan, Mongolia, Kyrgyzstan, Slovakia, the Czech Republic, Romania, Turkmenistan and Ukraine, the band 9 800-10 000 MHz is also allocated to the radionavigation service on a primary basis.

NOC **S5.479**

MOD **S5.480** *Additional allocation:* in Brazil, Costa Rica, Ecuador, Guatemala, Honduras and Mexico, the band 10-10.45 GHz is also allocated to the fixed and mobile services on a primary basis.

NOC **S5.481** and **S5.482**

MOD **S5.483** *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, China, Colombia, the Republic of Korea, Costa Rica, Egypt, the United Arab Emirates, Georgia, the Islamic Republic of Iran, Iraq, Israel, Japan, Jordan, Kazakstan, Kuwait, Latvia, Lebanon, Moldova, Mongolia, Uzbekistan, Pakistan, Qatar, Kyrgyzstan, Democratic People's Republic of Korea, Romania, Russia, Tajikistan, Turkmenistan, Ukraine, Yemen and Yugoslavia, the band 10.68-10.7 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985.

MOD

GHz
10.7-12.7

<table>
<tr><td colspan="3">Allocation to Services</td></tr>
<tr><td>Region 1</td><td>Region 2</td><td>Region 3</td></tr>
<tr><td>10.7-11.7
FIXED
FIXED-SATELLITE (space-to-Earth) (Earth-to-space) S5.441 S5.484
MOBILE except aeronautical mobile</td><td>10.7-11.7
FIXED
FIXED-SATELLITE (space-to-Earth) S5.441 S5.484A
MOBILE except aeronautical mobile</td><td>10.7-11.7
FIXED
FIXED-SATELLITE (space-to-Earth) S5.441
MOBILE except aeronautical mobile</td></tr>
<tr><td rowspan="2">11.7-12.5
FIXED
BROADCASTING
BROADCASTING-SATELLITE
Mobile except aeronautical mobile

S5.487 S5.487A S5.492</td><td>11.7-12.1
FIXED S5.486
FIXED-SATELLITE (space-to-Earth) S5.484A
Mobile except aeronautical mobile
S5.485 S5.488</td><td rowspan="2">11.7-12.2
FIXED
MOBILE except aeronautical mobile
BROADCASTING
BROADCASTING-SATELLITE

S5.487 S5.487A S5.492</td></tr>
<tr><td>12.1-12.2
FIXED-SATELLITE (space-to-Earth)
S5.484A S5.485 S5.488 S5.489</td></tr>
<tr><td>12.2-12.7
FIXED
MOBILE except aeronautical mobile
BROADCASTING
BROADCASTING-SATELLITE

S5.487A S5.488 S5.490 S5.492</td><td>12.2-12.5
FIXED
MOBILE except aeronautical mobile
BROADCASTING

S5.484A S5.487 S5.491</td></tr>
</table>

NOC **S5.484**

ADD **S5.484A** The use of the bands 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.75 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Region 1, 13.75-14.5 GHz (Earth-to-space), 17.8-18.6 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 27.5-28.6 GHz (Earth-to-space), 29.5-30 GHz (Earth-to-space) by non-geostationary- and geostationary-satellite systems in the fixed-satellite service is subject to the provisions of Resolution **130 (WRC-97)**. The use of the band 17.8-18.1 GHz (space-to-Earth) by non-geostationary fixed-satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**.

NOC **S5.485** to **S5.487**

ADD **S5.487A** *Additional allocation:* in Region 1, the band 11.7-12.5 GHz, in Region 2, the band 12.2-12.7 GHz and, in Region 3, the band 11.7-12.2 GHz, are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis, limited to non-geostationary systems and subject to the provisions of Resolution **538 (WRC-97)**.

NOC **S5.488** to **S5.491**

MOD **S5.492** Assignments to stations of the broadcasting-satellite service in conformity with the appropriate regional Plan in Appendix **S30** may also be used for transmissions in the fixed-satellite service (space-to-Earth), provided that such transmissions do not cause more interference or require more protection from interference than the broadcasting-satellite service transmissions operating in conformity with this Plan. With respect to the space services, this band shall be used principally for the broadcasting-satellite service.

MOD **S5.493** The broadcasting-satellite service in the band 12.5-12.75 GHz in Region 3 is limited to a power flux-density not exceeding –111 dB(W/m^2)/27 MHz for all conditions and for all methods of modulation at the edge of the service area.

MOD **S5.494** *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Cameroon, the Central African Republic, the Congo, Côte d'Ivoire, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Madagascar, Mali, Morocco, Mongolia, Nigeria, Qatar, Syria, Senegal, Somalia, Sudan, Chad, Togo, Yemen and Zaire, the band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

MOD **S5.495** *Additional allocation:* in Bosnia and Herzegovina, Croatia, Denmark, France, Greece, Liechtenstein, Monaco, Norway, Uganda, Portugal, Romania, Slovenia, Switzerland, Tanzania, Tunisia and Yugoslavia, the band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis.

MOD **S5.496** *Additional allocation:* in Austria, Azerbaijan, Kyrgyzstan, Turkmenistan and Ukraine, the band 12.5-12.75 GHz is also allocated to the fixed service and the mobile, except aeronautical mobile, service on a primary basis. However, stations in these services shall not cause harmful interference to fixed-satellite service earth stations of countries in Region 1 other than those listed in this footnote. Coordination of these earth stations is not required with stations of the fixed and mobile services of the countries listed in this footnote. The power flux-density limit at the Earth's surface given in Article **S21**, Table **S21-4**, for the fixed-satellite service shall apply on the territory of the countries listed in this footnote.

NOC **S5.497**

MOD

GHz
12.5-14.25

<table>
<tr><th colspan="3">Allocation to Services</th></tr>
<tr><th>Region 1</th><th>Region 2</th><th>Region 3</th></tr>
<tr><td rowspan="2">12.5-12.75
FIXED-SATELLITE (space-to-Earth) S5.484A (Earth-to-space)

S5.494 S5.495 S5.496</td><td></td><td rowspan="2">12.5-12.75
FIXED
FIXED-SATELLITE (space-to-Earth) S5.484A
MOBILE except aeronautical mobile
BROADCASTING-SATELLITE S5.493</td></tr>
<tr><td>12.7-12.75
FIXED
FIXED-SATELLITE (Earth-to-space)
MOBILE except aeronautical mobile</td></tr>
<tr><td>12.75-13.25</td><td colspan="2">FIXED
FIXED-SATELLITE (Earth-to-space) S5.441
MOBILE
Space Research (deep space) (space-to-Earth)</td></tr>
<tr><td>13.25-13.4</td><td colspan="2">EARTH EXPLORATION-SATELLITE (active)
AERONAUTICAL RADIONAVIGATION S5.497
SPACE RESEARCH (active)

S5.498A S5.499</td></tr>
<tr><td>13.4-13.75</td><td colspan="2">EARTH EXPLORATION-SATELLITE (active)
RADIOLOCATION
SPACE RESEARCH
Standard Frequency and Time Signal-Satellite (Earth-to-space)

S5.499 S5.500 S5.501 S5.501A S5.501B</td></tr>
</table>

MOD

GHz
12.5-14.25

Allocation to Services		
Region 1	Region 2	Region 3
13.75-14	FIXED-SATELLITE (Earth-to-space) S5.484A RADIOLOCATION Standard Frequency and Time Signal-Satellite (Earth-to-space) Space Research S5.499 S5.500 S5.501 S5.502 S5.503 S5.503A	
14-14.25	FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 RADIONAVIGATION S5.504 Mobile-Satellite (Earth-to-space) except aeronautical mobile-satellite Space Research S5.505	

SUP **S5.498**

ADD **S5.498A** The earth exploration-satellite (active) and space research (active) services operating in the band 13.25-13.4 GHz shall not cause harmful interference to, or constrain the use and development of, the aeronautical radionavigation service.

NOC **S5.499**

MOD **S5.500** *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Brunei Darussalam, Cameroon, the Republic of Korea, Egypt, the United Arab Emirates, Gabon, Indonesia, the Islamic Republic of Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Madagascar, Malaysia, Mali, Malta, Morocco, Mauritania, Nigeria, Pakistan, Qatar, Syria, Senegal, Singapore, Sudan, Chad and Tunisia, the band 13.4-14 GHz is also allocated to the fixed and mobile services on a primary basis.

MOD **S5.501** *Additional allocation:* in Austria, Azerbaijan, Bulgaria, Hungary, Japan, Mongolia, Kyrgyzstan, Romania, the United Kingdom, Turkmenistan and Ukraine, the band 13.4-14 GHz is also allocated to the radionavigation service on a primary basis.

ADD **S5.501A** The allocation of the band 13.4-13.75 GHz to the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the band by the space research service are on a secondary basis.

ADD **S5.501B** In the band 13.4-13.75 GHz, the earth exploration-satellite (active) and space research (active) services shall not cause harmful interference to, or constrain the use and development of, the radiolocation service.

NOC **S5.502** to **S5.504**

MOD **S5.505** *Additional allocation:* in Algeria, Angola, Saudi Arabia, Australia, Bahrain, Bangladesh, Botswana, Brunei Darussalam, Cameroon, China, the Congo, the Republic of Korea, Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Indonesia, the Islamic Republic of Iran, Iraq, Israel, Japan, Jordan, Kuwait, Lesotho, Lebanon, Malaysia, Mali, Morocco, Mauritania, Oman, Pakistan, the Philippines, Qatar, Syria, the Democratic People's Republic of Korea, Senegal, Singapore, Somalia, Sudan, Swaziland, Tanzania, Chad and Yemen, the band 14-14.3 GHz is also allocated to the fixed service on a primary basis.

NOC **S5.506** and **S5.507**

MOD

GHz
14.25-14.8

Allocation to Services		
Region 1	Region 2	Region 3
14.25-14.3	FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 RADIONAVIGATION S5.504 Mobile-Satellite (Earth-to-space) except aeronautical mobile-satellite Space Research S5.505 S5.508 S5.509	
14.3-14.4 FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 MOBILE except aeronautical mobile Mobile-Satellite (Earth-to-space) except aeronautical mobile-satellite Radionavigation-Satellite	**14.3-14.4** FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 Mobile-Satellite (Earth-to-space) except aeronautical mobile-satellite Radionavigation-Satellite	**14.3-14.4** FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 MOBILE except aeronautical mobile Mobile-Satellite (Earth-to-space) except aeronautical mobile-satellite Radionavigation-Satellite

MOD

GHz
14.25-14.8

Allocation to Services		
Region 1	Region 2	Region 3
14.4-14.47	FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 MOBILE except aeronautical mobile Mobile-Satellite (Earth-to-space) except aeronautical mobile-satellite Space Research (space-to-Earth)	
14.47-14.5	FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 MOBILE except aeronautical mobile Mobile-Satellite (Earth-to-space) except aeronautical mobile-satellite Radio Astronomy S5.149	

MOD **S5.508** *Additional allocation:* in Germany, Austria, Bosnia and Herzegovina, France, Greece, Ireland, Iceland, Italy, The Former Yugoslav Republic of Macedonia, Libya, Liechtenstein, Portugal, the United Kingdom, Slovenia, Switzerland, Turkey and Yugoslavia, the band 14.25-14.3 GHz is also allocated to the fixed service on a primary basis.

NOC **S5.509** and **S5.510**

MOD **S5.511** *Additional allocation:* in Saudi Arabia, Bahrain, Bosnia and Herzegovina, Cameroon, Egypt, the United Arab Emirates, Guinea, the Islamic Republic of Iran, Iraq, Israel, Kuwait, Lebanon, Libya, Pakistan, Qatar, Syria, Slovenia, Somalia and Yugoslavia, the band 15.35-15.4 GHz is also allocated to the fixed and mobile services on a secondary basis.

MOD

GHz
14.8-17.3

Allocation to Services		
Region 1	Region 2	Region 3
15.4-15.43	AERONAUTICAL RADIONAVIGATION S5.511D	
15.43-15.63	FIXED-SATELLITE (space-to-Earth) (Earth-to-space) S5.511A AERONAUTICAL RADIONAVIGATION S5.511C	
15.63-15.7	AERONAUTICAL RADIONAVIGATION S5.511D	
…		
16.6-17.1	RADIOLOCATION Space Research (deep space) (Earth-to-space) S5.512 S5.513	
…		
17.2-17.3	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) S5.512 S5.513 S5.513A	

MOD **S5.511A** Use of the band 15.43-15.63 GHz by the fixed-satellite service (space-to-Earth (see Resolution **123 (WRC-97)**) and Earth-to-space) is limited to feeder links of non-geostationary systems in the mobile-satellite service, subject to coordination under Resolution **46 (Rev.WRC-97)**/ No. **S9.11A**. In the space-to-Earth direction, the minimum earth station elevation angle above and gain towards the local horizontal plane and the minimum coordination distances to protect an earth station from harmful interference shall be in accordance with Recommendation ITU-R S.1341. Also in the space-to-Earth direction, harmful interference shall not be caused to stations of the radio astronomy service using the band 15.35-15.4 GHz.

The threshold levels of interference and associated power flux-density limits which are detrimental to the radio astronomy service are given in Recommendation ITU-R RA.769-1. Special measures will need to be employed to protect the radio astronomy service in the band 15.35-15.4 GHz.

SUP **S5.511B**

MOD **S5.511C** Stations operating in the aeronautical radionavigation service shall limit the effective e.i.r.p. in accordance with Recommendation ITU-R S.1340. The minimum coordination distance required to protect the aeronautical radionavigation stations (No. **S4.10** applies) from harmful interference from feeder-link earth stations and the maximum e.i.r.p. transmitted towards the local horizontal plane by a feeder-link earth station shall be in accordance with Recommendation ITU-R S.1340.

ADD **S5.511D** Fixed-satellite service systems for which complete information for advance publication has been received by the Bureau by 21 November 1997 may operate in the bands 15.4-15.43 GHz and 15.63-15.7 GHz in the space-to-Earth direction and 15.63-15.65 GHz in the Earth-to-space direction. In the bands 15.4-15.43 GHz and 15.65-15.7 GHz, emissions from a non-geostationary space station shall not exceed the power flux-density limits at the Earth's surface of –146 dB(W/m^2/MHz) for any angle of arrival. In the band 15.63-15.65 GHz, where an administration plans emissions from a non-geostationary space station that exceed –146 dB(W/m^2/MHz) for any angle of arrival, it shall coordinate under Resolution **46 (Rev.WRC-97)**/No. **S9.11A** with the affected administrations. Stations in the fixed-satellite service operating in the band 15.63-15.65 GHz in the Earth-to-space direction shall not cause harmful interference to stations in the aeronautical radionavigation service (No. **S4.10** applies).

MOD **S5.512** *Additional allocation:* in Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, Cameroon, the Congo, Costa Rica, Egypt, El Salvador, the United Arab Emirates, Finland, Guatemala, India, Indonesia, the Islamic Republic of Iran, Jordan, Kuwait, Libya, Malaysia, Morocco, Mozambique, Nepal, Nicaragua, Oman, Pakistan, Qatar, Singapore, Slovenia, Somalia, Sudan, Swaziland, Tanzania, Chad, Yemen and Yugoslavia, the band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis.

NOC **S5.513**

ADD **S5.513A** Spaceborne active sensors operating in the band 17.2-17.3 GHz shall not cause harmful interference to, or constrain the development of, the radiolocation and other services allocated on a primary basis.

MOD

GHz
17.3-18.6

<table>
<tr><td colspan="3">Allocation to Services</td></tr>
<tr><td>Region 1</td><td>Region 2</td><td>Region 3</td></tr>
<tr><td rowspan="2">17.7-18.1
FIXED
FIXED-SATELLITE
(space-to-Earth) S5.484A
(Earth-to-space) S5.516
MOBILE</td><td>17.7-17.8
FIXED
FIXED-SATELLITE
(space-to-Earth)
(Earth-to-space) S5.516
BROADCASTING-SATELLITE
Mobile S5.518
S5.515 S5.517</td><td rowspan="2">17.7-18.1
FIXED
FIXED-SATELLITE
(space-to-Earth) S5.484A
(Earth-to-space) S5.516
MOBILE</td></tr>
<tr><td>17.8-18.1
FIXED
FIXED-SATELLITE
(space-to-Earth) S5.484A
(Earth-to-space) S5.516
MOBILE</td></tr>
<tr><td>18.1-18.4</td><td colspan="2">FIXED
FIXED-SATELLITE (space-to-Earth) S5.484A
(Earth-to-space) S5.520
MOBILE
S5.519 S5.521</td></tr>
<tr><td>18.4-18.6</td><td colspan="2">FIXED
FIXED-SATELLITE (space-to-Earth) S5.484A
MOBILE</td></tr>
</table>

MOD **S5.514** *Additional allocation:* in Algeria, Germany, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Bosnia and Herzegovina, Cameroon, Costa Rica, El Salvador, the United Arab Emirates, Finland, Guatemala, Honduras, India, the Islamic Republic of Iran, Iraq, Israel, Japan, Jordan, Kuwait, Libya, Nepal, Nicaragua, Oman, Pakistan, Qatar, Slovenia, Sudan, Sweden and Yugoslavia, the band 17.3-17.7 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits given in Nos. **S21.3** and **S21.5** shall apply.

NOC **S5.515**

MOD **S5.516** The use of the band 17.3-18.1 GHz by geostationary-satellite systems in the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service. For the use of the band 17.3-17.8 GHz in Region 2 by feeder links for the broadcasting-satellite service in the band 12.2-12.7 GHz, see Article **S11**. The use of the bands 17.3-18.1 GHz (Earth-to-space) in Regions 1 and 3 and 17.8-18.1 GHz (Earth-to-space) in Region 2 by non-geostationary-satellite systems in the fixed-satellite service is subject to the provisions of Resolution **538 (WRC-97)**.

NOC **S5.517** to **S5.520**

MOD **S5.521** *Alternative allocation:* in Germany, Denmark, the United Arab Emirates, Greece, Slovakia and the Czech Republic, the band 18.1-18.4 GHz is allocated to the fixed, fixed-satellite (space-to-Earth) and mobile services on a primary basis (see No. **S5.33**). The provisions of No. **S5.519** also apply.

NOC **S5.522** and **S5.523**

MOD **S5.523A** The use of the bands 18.8-19.3 GHz (space-to-Earth) and 28.6-29.1 GHz (Earth-to-space) by geostationary and non-geostationary fixed-satellite service networks is subject to the application of the provisions of No. **S9.11A**/Resolution **46 (Rev.WRC-97)** and No. **S22.2** does not apply. Administrations having geostationary-satellite networks under coordination prior to 18 November 1995 shall cooperate to the maximum extent possible to coordinate pursuant to No. **S9.11A**/Resolution **46** (**Rev.WRC-97**) with non-geostationary-satellite networks for which notification information has been received by the Bureau prior to that date, with a view to reaching results acceptable to all the parties concerned. Non-geostationary-satellite networks shall not cause unacceptable interference to geostationary fixed-satellite service networks for which complete Appendix **S4** notification information is considered as having been received by the Bureau prior to 18 November 1995.

NOC **S5.523B**

MOD

GHz
18.6-20.2

Allocation to Services		
Region 1	Region 2	Region 3
19.3-19.7	FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) S5.523B S5.523C S5.523D S5.523E MOBILE	
19.7-20.1 FIXED-SATELLITE (space-to-Earth) S5.484A Mobile-Satellite (space-to-Earth) S5.524	**19.7-20.1** FIXED-SATELLITE (space-to-Earth) S5.484A MOBILE-SATELLITE (space-to-Earth) S5.524 S5.525 S5.526 S5.527 S5.528 S5.529	**19.7-20.1** FIXED-SATELLITE (space-to-Earth) S5.484A Mobile-Satellite (space-to-Earth) S5.524
20.1-20.2	FIXED-SATELLITE (space-to-Earth) S5.484A MOBILE-SATELLITE (space-to-Earth) S5.524 S5.525 S5.526 S5.527 S5.528	

MOD **S5.523C** No. **S22.2** of the Radio Regulations shall continue to apply in the bands 19.3-19.6 GHz and 29.1-29.4 GHz, between feeder links of non-geostationary mobile-satellite service networks and those fixed-satellite service networks for which complete Appendix **S4** coordination information, or notification information, is considered as having been received by the Bureau prior to 18 November 1995.

MOD **S5.523D** The use of the band 19.3-19.7 GHz (space-to-Earth) by geostationary fixed-satellite service systems and by feeder links for non-geostationary-satellite systems in the mobile-satellite service is subject to the application of the provisions of Resolution **46 (Rev.WRC-97)/** No. **S9.11A**, but not subject to the provisions of No. **S22.2**. The use of this band for other non-geostationary fixed-satellite service systems, or for the cases indicated in Nos. **S5.523C** and **S5.523E**, is not subject to the provisions of Resolution **46 (Rev.WRC-97)/**No. **S9.11A** and shall continue to be subject to Articles **S9** (except No. **S9.11A**) and **S11** procedures, and to the provisions of No. **S22.2**.

ADD **S5.523E** No. **S22.2** of the Radio Regulations shall continue to apply in the bands 19.6-19.7 GHz and 29.4-29.5 GHz, between feeder links of non-geostationary mobile-satellite service networks and those fixed-satellite service networks for which complete Appendix **S4** coordination information, or notification information, is considered as having been received by the Bureau by 21 November 1997.

MOD **S5.524** *Additional allocation:* in Afghanistan, Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, the Congo, the Republic of Korea, Costa Rica, Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Islamic Republic of Iran, Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syria, Democratic People's Republic of Korea, Singapore, Somalia, Sudan, Tanzania, Chad, Togo, Tunisia and Zaire, the band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis. This additional use shall not impose any limitation on the power flux-density of space stations in the fixed-satellite service in the band 19.7-21.2 GHz and of space stations in the mobile-satellite service in the band 19.7-20.2 GHz where the allocation to the mobile-satellite service is on a primary basis in the latter band.

NOC **S5.525** to **S5.535**

MOD

GHz
24.45-27

Allocation to Services		
Region 1	Region 2	Region 3
25.5-27	EARTH EXPLORATION-SATELLITE (space-to Earth) S5.536A S5.536B FIXED INTER-SATELLITE S5.536 MOBILE Standard Frequency and Time Signal-Satellite (Earth-to-space)	

MOD

GHz
27-29.9

Allocation to Services		
Region 1	Region 2	Region 3
27.5-28.5	FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.539 MOBILE S5.538 S5.540	
28.5-29.1	FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.523A S5.539 MOBILE Earth Exploration-Satellite (Earth-to-space) S5.541 S5.540	
29.1-29.5	FIXED FIXED-SATELLITE (Earth-to-space) S5.523C S5.523E S5.535A S5.539 S5.541A MOBILE Earth Exploration-Satellite (Earth-to-space) S5.541 S5.540	
29.5-29.9 FIXED-SATELLITE (Earth-to-space) S5.484A S5.539 Earth Exploration-Satellite (Earth-to-space) S5.541 Mobile-Satellite (Earth-to-space) S5.540 S5.542	**29.5-29.9** FIXED-SATELLITE (Earth-to-space) S5.484A S5.539 MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space) S5.541 S5.525 S5.526 S5.527 S5.529 S5.540 S5.542	**29.5-29.9** FIXED-SATELLITE (Earth-to-space) S5.484A S5.539 Earth Exploration-Satellite (Earth-to-space) S5.541 Mobile-Satellite (Earth-to-space) S5.540 S5.542

MOD **S5.535A** The use of the band 29.1-29.5 GHz (Earth-to-space) by the fixed-satellite service is limited to geostationary-satellite systems and feeder links to non-geostationary-satellite systems in the mobile-satellite service. Such use is subject to the application of the provisions of Resolution **46 (Rev.WRC-97)/**No. **S9.11A**, but not subject to the provisions of No. **S22.2**, except as indicated in Nos. **S5.523C** and **S5.523E** where such use is not subject to the provisions of Resolution **46 (Rev.WRC-97)**/No. **S9.11A** and shall continue to be subject to Articles **S9** (except No. **S9.11A**) and **S11** procedures, and to the provisions of No. **S22**.**2**.

NOC **S5.536**

ADD **S5.536A** Administrations installing earth exploration-satellite earth stations cannot claim protection from fixed and mobile stations operated by neighbouring administrations. In addition, earth stations operating in the earth exploration-satellite service should take into account Recommendation ITU-R SA.1278.

ADD **S5.536B** In Germany, Saudi Arabia, Austria, Belgium, Brazil, Bulgaria, China, the Republic of Korea, Denmark, Egypt, United Arab Emirates, Spain, Estonia, Finland, France, Hungary, India, Islamic Republic of Iran, Ireland, Israel, Italy, Jordan, Kenya, Kuwait, Lebanon, Libya, Liechtenstein, Lithuania, Moldova, Norway, Oman, Uganda, Pakistan, the Philippines, Poland, Portugal, Syria, Slovakia, Czech Republic, Romania, the United Kingdom, Singapore, Sweden, Switzerland, Tanzania, Turkey, Viet Nam and Zimbabwe, earth stations operating in the earth exploration-satellite service in the band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services.

NOC **S5.537** to **S5.541**

MOD **S5.541A** Feeder links of non-geostationary networks mobile-satellite service and geostationary networks fixed-satellite service operating in the band 29.1-29.5 GHz (Earth-to-space) shall employ uplink adaptive power control or other methods of fade compensation, such that the earth station transmissions shall be conducted at the power level required to meet the desired link performance while reducing the level of mutual interference between both networks. These methods shall apply to networks for which Appendix **S4** coordination information is considered as having been received by the Bureau after 17 May 1996 and until they are changed by a future competent world radiocommunication conference. Administrations submitting Appendix **S4** information for coordination before this date are encouraged to utilize these techniques to the extent practicable. These methods are also subject to review by ITU-R (see Resolution **121 (Rev.WRC-97)**).

MOD **S5.542** *Additional allocation:* in Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, the Congo, the Republic of Korea, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guinea, India, the Islamic Republic of Iran, Iraq, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Pakistan, the Philippines, Qatar, Syria, Democratic People's Republic of Korea, Somalia, Sudan, Sri Lanka and Chad, the band 29.5-31 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits specified in Nos. **S21.3** and **S21.5** shall apply.

NOC **S5.543** and **S5.544**

MOD **S5.545** *Different category of service:* in Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Kazakstan, Mongolia, Kyrgyzstan, Russia, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 31-31.3 GHz to the space research service is on a primary basis (see No. **S5.33**).

MOD

GHz
29.9-31.8

Allocation to Services		
Region 1	Region 2	Region 3
29.9-30	FIXED-SATELLITE (Earth-to-space) S5.484A S5.539 MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space) S5.541 S5.525 S5.526 S5.527 S5.538 S5.540 S5.542 S5.543	

MOD **S5.546** *Different category of service:* in Saudi Arabia, Armenia, Azerbaijan, Belarus, Bulgaria, Egypt, United Arab Emirates, Spain, Estonia, Finland, Georgia, Hungary, the Islamic Republic of Iran, Israel, Jordan, Kazakstan, Latvia, Lebanon, Moldova, Mongolia, Uzbekistan, Poland, Syria, Kyrgyzstan, Romania, the United Kingdom, Russia, Tajikistan, Turkmenistan, Turkey and Ukraine, the allocation of the band 31.5-31.8 GHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. **S5.33**).

MOD

GHz
31.8-37

Allocation to Services		
Region 1	Region 2	Region 3
31.8-32	FIXED S5.547A RADIONAVIGATION SPACE RESEARCH (deep space) (space-to-Earth) S5.547 S5.547B S5.548	
32-32.3	FIXED S5.547A INTER-SATELLITE RADIONAVIGATION SPACE RESEARCH (deep space) (space-to-Earth) S5.547 S5.547C S5.548	
32.3-33	FIXED S5.547A INTER-SATELLITE RADIONAVIGATION S5.547 S5.547D S5.548	

MOD

GHz
31.8-37

Allocation to Services		
Region 1	Region 2	Region 3
33-33.4	FIXED S5.547A RADIONAVIGATION S5.547 S5.547E	
…		
35.2-35.5	METEOROLOGICAL AIDS RADIOLOCATION S5.549	
35.5-36	METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) S5.549 S5.551A	

ADD **S5.547** The bands 31.8-33.4 GHz, 51.4-52.6 GHz, 55.78-59 GHz and 64-66 GHz are available for high-density applications in the fixed service (see Resolution **726 (WRC-97)**).

ADD **S5.547A** Use of the band 31.8-33.4 GHz by the fixed service shall be in accordance with Resolution **126 (WRC-97)**.

ADD **S5.547B** *Alternative allocation*: in the United States, the band 31.8-32 GHz is allocated to the radionavigation and space research (deep space) (space-to-Earth) services on a primary basis.

ADD **S5.547C** *Alternative allocation*: in the United States, the band 32-32.3 GHz is allocated to the inter-satellite, radionavigation and space research (deep space) (space-to-Earth) services on a primary basis.

ADD **S5.547D** *Alternative allocation*: in the United States, the band 32.3-33 GHz is allocated to the inter-satellite and radionavigation services on a primary basis.

ADD **S5.547E** *Alternative allocation*: in the United States, the band 33-33.4 GHz is allocated to the radionavigation service on a primary basis.

NOC **S5.548**

MOD **S5.549** *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Egypt, the United Arab Emirates, Gabon, Indonesia, the Islamic Republic of Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malaysia, Mali, Malta, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syria, Senegal, Singapore, Somalia, Sudan, Sri Lanka, Togo, Tunisia, Yemen and Zaire, the band 33.4-36 GHz is also allocated to the fixed and mobile services on a primary basis.

MOD **S5.550** *Different category of service:* in Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Kazakstan, Mongolia, Uzbekistan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 34.7-35.2 GHz to the space research service is on a primary basis (see No. **S5.33**).

SUP **S5.551**

ADD **S5.551A** In the band 35.5-36.0 GHz, active spaceborne sensors in the earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service, the meteorological aids service and other services allocated on a primary basis.

MOD

GHz
37-42.5

Allocation to Services		
Region 1	Region 2	Region 3
40.5-42.5	**40.5-42.5**	**40.5-42.5**
FIXED	FIXED	FIXED
BROADCASTING	FIXED-SATELLITE (space-to-Earth) S5.551B S5.551E	FIXED-SATELLITE (space-to-Earth) S5.551B S5.551E
BROADCASTING-SATELLITE	BROADCASTING	BROADCASTING
Mobile	BROADCASTING-SATELLITE	BROADCASTING-SATELLITE
	Mobile	Mobile
S5.551B S5.551D	S5.551C	S5.551C S5.551F

ADD **S5.551B** The use of the band 41.5-42.5 GHz by the fixed-satellite service (space-to-Earth) is subject to Resolution **128 (WRC-97)**.

ADD **S5.551C** *Alternative allocation:* in the French overseas territories in Regions 2 and 3, the Republic of Korea and India, the band 40.5-42.5 GHz is allocated to the broadcasting, broadcasting-satellite and fixed services on a primary basis.

ADD **S5.551D** *Additional allocation:* in Algeria, Saudi Arabia, Bahrain, Benin, Cameroon, Egypt, United Arab Emirates, Israel, Jordan, Kuwait, Lebanon, Libya, Mali, Morocco, Mauritania, Nigeria, Oman, Qatar, Syria, Tunisia and Yemen, the band 40.5-42.5 GHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis. The use of this band by the fixed-satellite service shall be in accordance with Resolution **134 (WRC-97)**.

ADD **S5.551E** Use of the band 40.5-42.5 GHz by the fixed-satellite service shall be in accordance with Resolution **134 (WRC-97)**.

ADD **S5.551F** *Different category of service*: in Japan, the allocation of the band 41.5-42.5 GHz to the mobile service is on a primary basis (see No. **S5.33**).

NOC **S5.552**

MOD

GHz
42.5-54.25

Allocation to Services		
Region 1	Region 2	Region 3
47.2-50.2	FIXED FIXED-SATELLITE (Earth-to-space) S5.552 MOBILE S5.149 S5.340 S5.552A S5.555	
50.2-50.4	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) S5.340 S5.555A	
…		
51.4-52.6	FIXED MOBILE S5.547 S5.556	
52.6-54.25	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) S5.340 S5.556	

ADD **S5.552A** The allocation to the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz is designated for use by high altitude platform stations. The use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz is subject to the provisions of Resolution **122 (WRC-97)**.

NOC **S5.553** to **S5.555**

ADD **S5.555A** The band 50.2-50.4 GHz is also allocated, on a primary basis, to the fixed and mobile services until 1 July 2000.

MOD

GHz
54.25-71

Allocation to Services		
Region 1	Region 2	Region 3
54.25-55.78	EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE S5.556A SPACE RESEARCH (passive) S5.556B	
55.78-56.9	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE S5.556A MOBILE S5.558 SPACE RESEARCH (passive) S5.547 S5.557	
56.9-57	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE S5.558A MOBILE S5.558 SPACE RESEARCH (passive) S5.547 S5.557	
57-58.2	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE S5.556A MOBILE S5.558 SPACE RESEARCH (passive) S5.547 S5.557	

MOD

GHz
54.25-71

Allocation to Services		
Region 1	Region 2	Region 3
58.2-59	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) S5.547 S5.556	
59-59.3	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE S5.556A MOBILE S5.558 RADIOLOCATION S5.559 SPACE RESEARCH (passive)	
59.3-64	FIXED INTER-SATELLITE MOBILE S5.558 RADIOLOCATION S5.559 S5.138	
64-65	FIXED INTER-SATELLITE MOBILE except aeronautical mobile S5.547 S5.556	
65-66	EARTH EXPLORATION-SATELLITE FIXED INTER-SATELLITE MOBILE except aeronautical mobile SPACE RESEARCH S5.547	

MOD

GHz
54.25-71

Allocation to Services		
Region 1	Region 2	Region 3
66-71	INTER-SATELLITE MOBILE S5.553 S5.558 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE S5.554	

NOC **S5.556**

ADD **S5.556A** Use of the bands 54.25-56.9 GHz, 57-58.2 GHz and 59-59.3 GHz by the inter-satellite service is limited to satellites in the geostationary-satellite orbit. The single-entry power flux-density at all altitudes from 0 km to 1 000 km above the Earth's surface produced by a station in the inter-satellite service, for all conditions and for all methods of modulation, shall not exceed –147 dB(W/m^2/100 MHz) for all angles of arrival.

ADD **S5.556B** *Additional allocation:* in Japan, the band 54.25-55.78 GHz is also allocated to the mobile service on a primary basis for low-density use.

MOD **S5.557** *Additional allocation:* in Japan, the band 55.78-58.2 GHz is also allocated to the radiolocation service on a primary basis.

MOD **S5.558** In the bands 55.78-58.2 GHz, 59-64 GHz, 66-71 GHz, 116-134 GHz, 170-182 GHz and 185-190 GHz, stations in the aeronautical mobile service may be operated subject to not causing harmful interference to the inter-satellite service (see No. **S5.43**).

ADD **S5.558A** Use of the band 56.9-57 GHz by inter-satellite systems is limited to links between satellites in geostationary-satellite orbit and to transmissions from non-geostationary satellites in high-Earth orbit to those in low-Earth orbit. For links between satellites in the geostationary-satellite orbit, the single entry power flux-density at all altitudes from 0 km to 1 000 km above the Earth's surface, for all conditions and for all methods of modulation, shall not exceed –147 dB(W/m^2/100 MHz) for all angles of arrival.

NOC **S5.559** to **S5.561**

MOD

GHz
86-116

Allocation to Services		
Region 1	Region 2	Region 3
92-94	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIOLOCATION S5.149 S5.556	
94-94.1	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) S5.562	
94.1-95	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIOLOCATION S5.149 S5.556	

ADD **S5.562** The use of the band 94-94.1 GHz by the earth exploration-satellite (active) and space research (active) services is limited to spaceborne cloud radars.

NOC **S5.563**

MOD **S5.564** *Additional allocation:* in Germany, Argentina, Spain, Finland, France, India, Italy and the Netherlands, the band 261-265 GHz is also allocated to the radio astronomy service on a primary basis.

NOC **S5.565**

ARTICLE S8

Status of Frequency Assignments Recorded in the Master International Frequency Register

NOC **S8.1**

MOD **S8.1.1** [1] The expression “frequency assignment", wherever it appears in this Chapter, shall be understood to refer either to a new frequency assignment or to a change in an assignment already recorded in the Master Register. Additionally, wherever the expression relates to a space station in the geostationary-satellite orbit or in a non-geostationary-satellite orbit, it shall be associated with § A.4 of Annex 2A to Appendix **S4**, as relevant.

S8.2 Not used.

MOD **S8.3** Any frequency assignment recorded in the Master Register with a favourable finding under No. **S11.31** shall have the right to international recognition. For such an assignment, this right means that other administrations shall take it into account when making their own assignments, in order to avoid harmful interference. In addition, frequency assignments in frequency bands subject to coordination or to a plan shall have a status derived from the application of the procedures relating to the coordination or associated with the plan.

MOD **S8.4** A frequency assignment shall be known as a non-conforming assignment when it is not in accordance with the Table of Frequency Allocations or the other[2] provisions of these Regulations. Such an assignment shall be recorded for information purposes, only when the notifying administration states that it will be operated in accordance with No. **S4.4** (See also No. **S8.5**).

NOC **S8.4.1** and **S8.5**

ARTICLE S9

MOD

Procedure for Effecting Coordination With or Obtaining Agreement of Other Administrations[1, 2, 3, 4, 5]

MOD **A.S9.1**

[1] For the application of the provisions of this Article with respect to stations in a space radiocommunication service using frequency bands covered by the fixed-satellite service allotment Plan, see also Appendix **S30B**.

NOC **A.S9.2**

MOD **A.S9.3**

[3] See also Appendices **S30** and **S30A**, as appropriate, for the coordination of:

a) proposed modifications to the Appendix **S30** Plans for the broadcasting-satellite service in the frequency bands 11.7-12.2 GHz (in Region 3), 11.7-12.5 GHz (in Region 1) and 12.2-12.7 GHz (in Region 2), with respect to frequency assignments in the same service or in other services to which these bands are allocated;

b) frequency assignments in other services to which the frequency bands referred to in § *a)* above are allocated in the same Region or in another Region, with respect to assignments in the broadcasting-satellite service which are subject to the Appendix **S30** Plans;

c) proposed modifications to the Appendix **S30A** Plans for feeder links to the broadcasting-satellite service in the frequency bands 17.3 -17.8 GHz (in Region 2) and 14.5-14.8 GHz and 17.3-18.1 GHz (in Regions 1 and 3), with respect to frequency assignments in the same service or in other services to which these bands are allocated;

d) frequency assignments in other services to which the frequency bands referred to in § *c)* above are allocated in the same Region or in another Region, with respect to assignments in the fixed-satellite service (Earth-to-space) which are subject to the Appendix **S30A** Plans.

For the broadcasting-satellite service and for feeder links for the broadcasting-satellite service in the fixed-satellite service in Region 2, Resolution **42** (**Orb-85**) is also applicable.

ADD **A.S9.4** [4] Resolution **49 (WRC-97)** shall also be applied with respect to those satellite networks and satellite systems that are subject to it.

ADD **A.S9.5** [5] See also Resolutions **51 (WRC-97)**, **130 (WRC-97)** and **538 (WRC-97)**.

MOD

Section I. Advance Publication of Information on Satellite Networks or Satellite Systems

General

MOD **S9.1** Before initiating any action under this Article or under Article **S11** in respect of frequency assignments for a satellite network or a satellite system, an administration, or one[1] acting on behalf of a group of named administrations, shall, prior to the coordination procedure described in Section II of Article **S9** below, where applicable, send to the Bureau a general description of the network or system, for advance publication in the Weekly Circular, not earlier than five years and preferably not later than two years before the planned date of bringing into use of the network or system (see also Nos. **S11.44** and **S11.44B** to **S11.44I**). The characteristics to be provided for this purpose are listed in Appendix **S4**. The coordination or notification information may also be communicated to the Bureau at the same time; it shall be considered as having been received by the Bureau not earlier than six months after the date of receipt of the information for advance publication where coordination is required by Section II of Article **S9**. Where coordination is not required by Section II, notification shall be considered as having been received by the Bureau not earlier than six months after the date of publication of the advance publication information.

NOC **S9.1.1**

MOD **S9.2** Amendments to the information sent in accordance with the provisions of No. **S9.1** shall also be sent to the Bureau as soon as they become available. The use of an additional frequency band will require the application of the advance publication procedure for this band.

NOC **S9.2A** and **S9.2B**

ADD

Sub-Section IA. Advance Publication of Information on Satellite Networks or Satellite Systems that are not Subject to Coordination Procedure Under Section II

MOD **S9.3** If, upon receipt of the Weekly Circular containing information published under No. **S9.2B**, any administration believes that interference which may be unacceptable may be caused to its existing or planned satellite networks or systems, it shall within four months of the date of publication of the Weekly Circular communicate to the publishing administration its comments on the particulars of the anticipated interference to its existing or planned systems. A copy of these comments shall also be sent to the Bureau. Thereafter, both administrations shall endeavour to cooperate in joint efforts to resolve any difficulties, with the assistance of the Bureau, if so requested by either of the parties, and shall exchange any addi-tional relevant information that may be available. If no such comments are received from an administration within the aforementioned period, it may be assumed that the administration concerned has no objections to the planned satellite network(s) of the system on which details have been published.

SUP **S9.3.1**

MOD **S9.4** In the case of difficulties, the administration responsible for the planned satellite network shall explore all possible means to resolve the difficulties without considering the possibility of adjustment to networks of other administrations. If no such means can be found, it may request the other administrations to explore all possible means to meet its requirements. The administrations concerned shall make every possible effort to resolve the difficulties by means of mutually acceptable adjustments to their networks. An administration on behalf of which details of planned satellite networks have been published in accordance with the provisions of No. **S9.2B** shall, after the period of four months, inform the Bureau of the progress made in resolving any difficulties. If necessary, a further report shall be provided prior to the submission of notices to the Bureau under Article **S11**.

NOC **S9.5**

MOD **S9.5A** The procedure of Section IA shall be considered mainly for the purposes of informing all administrations of developments in the use of space radiocommunications.

Sub-Section IB. Advance Publication of Information on Satellite Networks or Satellite Systems that are Subjectto Coordination Procedure under Section II

ADD **S9.5B** If, upon receipt of the Weekly Circular containing information published under No. **S9.2B**, any administration considers its existing or planned satellite systems or networks or terrestrial stations[1] to be affected, it may send its comments to the publishing administration, so that the latter may take those comments into consideration when initiating the coordination procedure. A copy of these comments shall also be sent to the Bureau. Thereafter, both administrations shall endeavour to cooperate in joint efforts to resolve any difficulties, with the assistance of the Bureau, if so requested by either of the parties, and shall exchange any additional relevant information that may be available.

ADD **S9.5B.1** [1] The only terrestrial stations to be taken into account are those for which the requirement to coordinate is under Nos. **S9.11**, **S9.11A** and **S9.21**.

ADD **S9.5C** The procedure of Section IB shall be considered mainly for the purposes of informing all administrations of developments in the use of space radiocommunications

ADD **S9.5D** If the information under No. **S9.30** has not been received by the Bureau within a period of 24 months after the date of receipt by the Bureau of the relevant information under Nos. **S9.1** and **S9.2,** the information published under No. **S9.2B** shall be cancelled, after the administration concerned has been informed at least three months before the end of the 24-month period. The Bureau shall also publish the cancellation in its Weekly Circular.

MOD **Section II. Procedure for Effecting Coordination**[1, 2]

NOC **S9.II.1** and **S9.II.2**

Sub-Section IIA. Requirement and Request for Coordination

MOD **S9.6** Before an administration[3, 4] notifies to the Bureau or brings into use a frequency assignment in any of the cases listed below, it shall effect coordination, as required, with other administrations identified under No. **S9.27**:

MOD **S9.6.1** [3] In the case of coordination of an assignment in a satellite network, an administration may act on behalf of a group of named administrations. Whenever, under this provision, an administration acts on behalf of a group of named administrations, all members of the group retain the right to respond in respect of their own services which could affect or be affected by the proposed assignment.

ADD **S9.6.2** [4] In all cases, the coordination of an earth station with terrestrial stations or other earth stations operating in the opposite direction of transmission shall remain within the authority of the administration on the territory of which this station is located.

MOD **S9.7** *a)* for a station in a satellite network using the geostationary-satellite orbit, in any space radiocommunication service, in a frequency band and in a Region where this service is not subject to a plan, in respect of any other satellite network using that orbit, in any space radiocommunication service in a frequency band and in a Region where this service is not subject to a plan, with the exception of coordination between earth stations operating in the opposite direction of transmission.

(MOD) **S9.8** *b)*[5]

(MOD) **S9.9** *c)*[5]

ADD **S9.8.1** and **S9.9.1** [5] Application of this provision with respect to Articles 6 and 7 of Appendices **S30** and **S30A** is suspended pending a decision of the 1999 World Radiocommunication Conference on the revision of these two Appendices.

S9.10 Not used.

MOD **S9.11** *d)* for a space station in the broadcasting-satellite service in any band shared on an equal primary basis with terrestrial services and where the broadcasting-satellite service is not subject to a plan, in respect of terrestrial services;

NOC **S9.11A**

MOD **S9.12** i) in a satellite network using a non-geostationary-satellite orbit, in respect of any other satellite network using a non-geostationary-satellite orbit, and in respect of any other satellite network using the geostationary-satellite orbit, with the exception of coordination between earth stations operating in the opposite direction of transmission;

MOD **S9.13** ii) in a satellite network using the geostationary-satellite orbit, in respect of any other satellite network using a non-geostationary-satellite orbit, with the exception of coordination between earth stations operating in the opposite direction of transmission;

NOC **S9.14** to **S9.16**

(MOD) **S9.17** *f)*[6]

ADD **S9.17.1** [6] Application of this provision with respect to Articles 6 and 7 of Appendices **S30** and **S30A** is suspended pending a decision of the 1999 World Radiocommunication Conference on the revision of these two Appendices.

MOD **S9.17A** *g)* for any specific earth station, in respect of other earth stations operating in the opposite direction of transmission, in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission and where the coordination area of the

earth station includes the territory of another country or the earth station is located within the coordination area of another earth station, with the exception of the frequency bands subject to the Appendix **S30A** Plans;

MOD **S9.18** *h)* for any transmitting station of a terrestrial service in the bands referred to in No. **S9.17** within the coordination area of an earth station, in respect of this earth station, with the exception of the coordination under Nos. **S9.16** and **S9.19**;

MOD **S9.19** *i)* for any transmitting station of a terrestrial service in a frequency band shared on an equal primary basis with the broadcasting-satellite service, with respect to an earth station of the broadcasting-satellite service, except where this service is subject to the Appendix **S30** Plans;

SUP *Footnote* [6]

NOC **S9.20** to **S9.42**

MOD **S9.43** Those administrations not responding under No. **S9.41** within the time limit specified therein shall be regarded as unaffected and the provisions of Nos. **S9.48** and **S9.49** shall apply.

NOC **S9.44** to **S9.49**

Sub-Section IIC. Action Upon a Request for Coordination

MOD **S9.50** An administration having received a request for coordination under Nos. **S9.7** to **S9.21**, or having been included in the procedure following action under No. **S9.41**, shall promptly examine the matter with regard to interference which may be caused to or, in certain cases, by its own assignments[8], identified in accordance with Appendix **S5**[9].

NOC **S9.50.1** and **9.50.2**

MOD **S9.51** Following its action under No. **S9.50**, the administration with which coordination was sought under Nos. **S9.7** to **S9.9** shall, within four months of the date of publication of the Weekly Circular under No. **S9.38**, either inform the requesting administration and the Bureau of its agreement or act under No. **S9.52**.

MOD **S9.51A** Following its action under No. **S9.50**, the administration with which coordination was sought under Nos. **S9.15** to **S9.19** shall, within four months of the date of dispatch of the coordination data under No. **S9.29**, either inform the requesting administration of its agreement or act under No. **S9.52**.

MOD **S9.52** If an administration, following its action under No. **S9.50**, does not agree to the request for coordination, it shall, within four months of the date of publication of the Weekly Circular underNo. **S9.38**, or of the date of dispatch of the coordination data under No. **S9.29**, inform the requesting administration of its disagreement and shall provide information concerning its own assignments upon which that disagreement is based. It shall also make such suggestions as it is able to offer with a view to satisfactory resolution of the matter. A copy of that information shall be sent to the Bureau. Where the information relates to terrestrial stations or earth stations operating in the opposite direction of transmission within the coordination area of an earth station, only that information relating to existing radiocommunication stations or to those to be brought into use within the next three months for terrestrial stations, or three years for earth stations, shall be treated as notifications under Nos. **S11.2** or **S11.9**.

NOC **S9.52A** to **S9.59**

Sub-Section IID. Action in the Event of No Reply, No Decision or Disagreement on a Request for Coordination

MOD **S9.60** If, within the same four-month period specified in Nos. **S9.51** or **S9.51A**, an administration with which coordination is sought under Nos. **S9.7** to **S9.9** and **S9.15** to **S9.19** fails to reply or to give a decision under Nos. **S9.51** or **S9.51A** or, following its disagreement under No. **S9.52**, fails to provide information concerning its own assignments on which its disagreement is based, the requesting administration may seek the assistance of the Bureau.

NOC **S9.61** to **S9.65.1**

ARTICLE S11

MOD **Notification and Recording of Frequency Assignments**[1, 2, 3]

MOD **A.S11.1** [1] See also Appendices **S30** and **S30A** as appropriate, for the notification and recording of:

a) frequency assignments to stations in the broadcasting-satellite service in the frequency bands 11.7-12.2 GHz (in Region 3), 11.7-12.5 GHz (in Region 1) and 12.2-12.7 GHz (in Region 2);

b) frequency assignments to stations in other services to which the frequency bands referred to in § *a)* above are allocated in the same Region or in another Region, so far as their relationship to the broadcasting-satellite service, which is subject to Appendix **S30**, is concerned;

c) frequency assignments to feeder-link stations in the fixed-satellite service (Earth-to-space) in the frequency bands 14.5-14.8 GHz in Region 1 (see No. **S5.510**) and in Region 3, 17.3-18.1 GHz in Regions 1 and 3 and 17.3-17.8 GHz in Region 2, and to stations in other services in these bands;

d) frequency assignments to stations in the same service or other services to which the frequency bands referred to in § *c)* above are allocated in the same Region or in another Region, so far as their relationship to the fixed-satellite service (Earth-to-space) in these bands is concerned.

For the broadcasting-satellite service in Region 2 and for feeder links in the fixed-satellite service for the broadcasting-satellite service in Region 2, Resolution **42 (Rev.Orb-88)** is also applicable.

See also Appendix **S30B** for the notification and recording of assignments in the following frequency bands:

All Regions, fixed-satellite service only

4 500-4 800 MHz	(space-to-Earth)
6 725-7 025 MHz	(Earth-to-space)
10.7-10.95 GHz	(space-to-Earth)
11.2-11.45 GHz	(space-to-Earth)
12.75-13.25 GHz	(Earth-to-space)

ADD **A.S11.2** [2] Resolution **49 (WRC-97)** shall also be applied with respect to those satellite networks and satellite systems that are subject to it.

ADD **A.S11.3** [3] See also Resolutions **51 (WRC-97)**, **130 (WRC-97)** and **538 (WRC-97)**.

NOC **S11.1** to **S11.13**

MOD **S11.14** Frequency assignments to ship stations and to mobile stations of other services, to stations in the amateur service, to earth stations in the amateur-satellite service, and those to broadcasting stations in the high-frequency bands allocated to the broadcasting service between 5 900 kHz and 26 100 kHz which are subject to Article **S12** shall not be notified under this Article.

NOC **S11.15** to **S11.17**

MOD **S11.18** *a)* stations covered by the Allotment Plans in Appendices **S25**, **S26** and **S27**;

NOC **S11.19** and **S11.20**

MOD **S11.21** *d)* any terrestrial stations in bands shared with space services which exceed the limits specified in Table II of Appendix **S7** and in No. **S21.3**;[2]

ADD **S11.21A** *e)* any terrestrial stations in bands listed in Table **S21-2**;[2]

MOD **S11.22** *f)* earth stations whose coordination area includes the territory of another administration, or where the earth station is located within the coordination area of an earth station operating in the opposite direction of transmission;[2,3]

ADD **S11.22.1** [3] In such cases, individual notices of frequency assignments are required for frequency bands allocated with equal rights to space services, in the opposite direction of transmission, where coordination is required under Appendix **S5**, Table S5-1.

(MOD) **S11.23** *g)* earth stations whose interference potential is greater than that of a coordinated typical earth station.[2]

(MOD) **S11.20.1** to **S11.23.1** [2] In such cases, individual notices of frequency assignments are required for frequency bands allocated with equal rights to terrestrial and space services where coordination is required under Appendix **S5**, Table S5-1.

MOD **S11.24** Notices relating to assignments to stations of terrestrial services, except for those referred to in Nos. **S11.25** or **S11.26**, shall reach the Bureau not earlier than three months before the assignments are brought into use.

MOD **S11.25** Notices relating to assignments to stations in space services, and to terrestrial stations involved in coordination with a satellite network, shall reach the Bureau not earlier than three years before the assignments are brought into use.

ADD **S11.26** Notices relating to assignments for high altitude platform stations in the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz shall reach the Bureau not earlier than five years before the assignments are brought into use.

Section II. Examination of Notices and Recording of Frequency Assignments in the Master Register

MOD **S11.27** Notices not containing those characteristics specified in Appendix **S4** as mandatory or required shall be returned with comments to help the notifying administration to complete and resubmit them, unless the information not provided is immediately forthcoming in response to an inquiry by the Bureau.

NOC **S11.28** to **S11.31.2**

MOD **S11.31.3** [3] Notices relating to radio astronomy stations are examined with respect to No. **S11.31** only.

NOC **S11.32** to **S11.35**

MOD **S11.36** When the examination with respect to No. **S11.31** leads to a favourable finding, the assignment shall be recorded in the Master Register or examined further with respect to Nos. **S11.32** to **S11.34**, as appropriate. When the finding with respect to No. **S11.31** is unfavourable, the assignment shall be recorded in the Master Register for information purposes and subject to application of No. **S8.5**, only if the administration undertakes that it will be operated in accordance with No. **S4.4**; otherwise the notice shall be returned with an indication of the appropriate action.

(MOD) **S11.37** When the examination with respect to No. **S11.32** leads to a favourable finding, the assignment shall be recorded in the Master Register indicating the administrations with which the coordination procedure has been completed.[7, 8] When the finding is unfavourable, the notice shall be returned to the notifying administration, with an indication of the appropriate action, if Nos. **S11.32A** or **S11.33** do not apply.

ADD **S11.37.1** [7] When the agreement of the administrations affected has been obtained only for a specified period, the Bureau shall be notified accordingly and the frequency assignment shall be recorded in the Master Register with a note indicating that the frequency assignment is valid only for the period specified. The notifying administration using the frequency assignment over a specified period shall not subsequently use this circumstance to justify continued use of the frequency beyond the period specified if it does not obtain the agreement of the administration(s) concerned.

ADD **S11.37.2** [8] When a frequency assignment to a space station in the broadcasting-satellite service in a non-planned band is recorded in the Master Register, a note shall be entered in the remarks column indicating that such recording does not prejudge in any way the decisions to be included in the agreements and associated plans referred to in Resolution **507**.

NOC **S11.38**

MOD **S11.39** When the examination with respect to No. **S11.34** leads to a favourable finding, the assignment shall be recorded in the Master Register. When the finding is unfavourable, the notice shall be returned to the notifying administration, with an indication of the appropriate action. However, notices under Appendices **S25**, **S26** and **S27** shall be treated as follows:

NOC **S11.39A**

(MOD) **S11.39B** When the examination under No. **S11.39A** leads to a favourable finding, the assignment shall be recorded in the Master Register. When the finding is unfavourable, the assignment shall be recorded in the Master Register with a symbol indicating that it shall

cause no harmful interference to any frequency assignment which is either in conformity with the Allotment Plan or recorded in the Master Register with a favourable finding with respect to No. **S11.39A**.

NOC **S11.39C**

(MOD) **S11.39D** When the examination under No. **S11.39C** leads to a favourable finding, the assignment shall be recorded in the Master Register. When the finding is unfavourable, the assignment shall be recorded in the Master Register with a symbol indicating that it shall cause no harmful interference to any frequency assignment which is either in conformity with the Allotment Plan or recorded in the Master Register with a favourable finding with respect to No. **S11.39C**.

ADD **S11.39E** In the case of a notice not in conformity with the Allotment Plan of Appendix **S25**, the assignment may be recorded provisionally in the Master Register on the condition that the administration has initiated the procedure of Appendix **S25** in accordance with § 1.23 of Section I of Appendix **S25**.

S11.40 Not used.

(MOD) **S11.41** After a notice is returned under No. **S11.38**, should the notifying administration resubmit the notice and insist upon its reconsideration, the Bureau shall enter the assignment provisionally in the Master Register with an indication of those administrations whose assignments were the basis of the unfavourable finding[9]. The entry shall be changed from provisional to definitive recording in the Master Register only if the Bureau is informed that the new assignment has been in use, together with the assignment which was the basis for the unfavourable finding, for at least four months without any complaint of harmful interference being made (see Nos. **S11.47** and **S11.49**).

(MOD) **S11.41.1**

[9] The entry shall be definitive in the case of a frequency assignment to a receiving station, under the condition that the notifying administration has undertaken that no complaint will be made in respect of any harmful interference which may be caused to that assignment by the assignment which was the basis for the unfavourable finding.

NOC **S11.42**

MOD **S11.43** In every case when a new assignment is recorded in the Master Register it shall, in accordance with the provisions of Article **S8** of this Chapter, include an indication of the finding reflecting the status of the assignment. This information shall also be published in the Weekly Circular.

MOD **S11.43A** A notice of a change in the characteristics of an assignment already recorded, as specified in Appendix **S4**, shall be examined by the Bureau under Nos. **S11.31** to **S11.34**, as appropriate. Any change to the characteristics of an assignment that has been notified and confirmed as having been brought into use shall be brought into use within five years from the date of the notification of the modification. Any change to the characteristics of an assignment that has been notified but not yet brought into use shall be brought into use within the period provided for in No. **S11.44**

NOC **S11.43B** to **S11.43D**

MOD **S11.44** The notified date of bringing into use of any assignment to a space station of a satellite network shall be no later than five years following the date of receipt by the Bureau of the relevant information under No. **S9.1**. The notified date of bringing into use may be extended at the request of the notifying administration by not more than two years, only under the conditions specified under Nos. **S11.44B** to **S11.44I**. Any frequency assignment not brought into use within the required period shall be cancelled by the Bureau after having informed the administration at least three months before the expiry of this period.

ADD **S11.44A** A notice not conforming to No. **S11.44** shall be returned to the notifying administration with a recommendation to restart the advance publication procedure.

ADD **S11.44B** The notified date of bringing into use will be extended by the Bureau in accordance with No. **S11.44** if due diligence information required by Resolution **49 (WRC-97)** is provided for the satellite network; if the procedure for effecting coordination in accordance with Section II of Article **S9** as applicable has commenced; and if the notifying administration certifies that the reason for the extension is one or more of the following specific circumstances:

ADD **S11.44C** *a)* launch failure;

ADD **S11.44D** *b)* launch delays due to circumstances outside the control of the administration or operator;

ADD **S11.44E** *c)* delays caused by modifications of satellite design necessary to reach coordination agreements;

ADD **S11.44F** *d)* problems in meeting the satellite design specifications;

ADD **S11.44G** *e)* delays in effecting coordination after the assistance of the Bureau was requested under No. **S9.59**.

ADD **S11.44H** *f)* financial circumstances outside the control of the administration or the operator; or

ADD **S11.44I** *g)* force majeure

NOC **S11.45** and **S11.46**

MOD **S11.47** All frequency assignments notified in advance of their being brought into use shall be entered provisionally in the Master Register. Any frequency assignment provisionally recorded under this provision shall be brought into use by the date specified in the notice, or by the date of expiry of the extension granted under No. **S11.44** or No. **S11.45**. Within thirty days of such an assignment being brought into use, the notifying administration shall so inform the Bureau. If the Bureau does not receive that confirmation within the above period, after sending a reminder, it shall cancel the entry. The Bureau shall however inform the administration concerned before taking such action.

MOD **S11.48** If, after the expiry of the period of five years, plus the extension specified in No. **S11.44**, as appropriate, from the date of receipt of the complete information referred to in No. **S9.1**, the administration responsible for the satellite network has not brought the frequency assignments to stations of the network into use, the corresponding information published under Nos. **S9.2B** and **S9.38**, as appropriate, shall be cancelled, but only after the administration concerned has been informed at least three months before the expiry date referred to in No. **S11.44**.

NOC **S11.49**

ADD

ARTICLE S12

Seasonal Planning of the HF Bands Allocated to the Broadcasting Service Between 5 900 kHz and 26 100 kHz

Section I. Introduction

S12.1 The use of the frequency bands allocated to the high-frequency broadcasting (HFBC) between 5 900 kHz and 26 100 kHz shall be based on the principles given below and shall be in conformity with seasonal planning based on a coordination procedure between administrations (referred in this Article as the Procedure) described in **S12.2** to **S12.45**. An administration may authorize a broadcasting organization (referred to in this Article as a broadcaster), among others, to act on its behalf in this coordination.

Section II. Principles

S12.2 § 1. The Procedure shall be based on the principle of equal rights of all countries, large or small, to equitable access to these bands. Attempts shall also be made to achieve efficient use of these frequency bands, account being taken of the technical and economic constraints that may exist in certain cases. On the basis of the foregoing, the following principles shall be applied.

S12.3 § 2. All broadcasting requirements, formulated by administrations, shall be taken into account and treated on an equitable basis, so as to guarantee the equality of rights referred to in No. **S12.2**, and to enable each administration to provide a satisfactory service.

S12.4 § 3. The Procedure shall be based solely on the broadcasting requirements expected to become operational during the schedule period. It shall furthermore be flexible in order to take into account new broadcasting requirements and modifications to existing broadcasting requirements.

S12.5 § 4. All broadcasting requirements, national[1] and international, shall be treated on an equal basis, with due consideration of the differences between these two kinds of broadcasting requirements.

S12.5.1 [1] An HF broadcasting requirement is considered as being for the purposes of national coverage when the transmitting station and its associated required service area are both located within the territory of the same country.

S12.6 § 5. In the Procedure, an attempt shall be made to ensure, as far as practicable, continuity of use of a frequency or of a frequency band.

S12.7 § 6. The Procedure shall be based on double-sideband or single-sideband emissions. Other modulation techniques recommended by ITU-R shall be permitted in place of double-sideband or single-sideband emissions, provided that the level of interference caused to existing emissions is not increased.

S12.8 § 7. To promote efficient spectrum use, the number of frequencies used shall be the minimum necessary to provide a satisfactory quality of reception. Whenever practicable, only one frequency should be used.

S12.9 § 8. The Procedure shall include a technical analysis, as specified in the Radio Regulations Board Rules of Procedure.

S12.10 § 9. The Procedure should encourage administrations or broadcasters empowered to make changes to pursue a continual coordination process to resolve incompatibilities, at meetings (regional[2] or worldwide, bilateral or multilateral) or by correspondence.

S12.10.1 [2] The word "regional" in this Article is not related to the ITU Regions.

S12.11 § 10. Regional coordination groups, which will facilitate bilateral and multilateral coordination among administrations and broadcasters in various regions of the world, shall identify themselves to the Bureau. Administrations and broadcasters shall be urged to participate in the relevant regional coordination groups. However, such participation would be on a voluntary basis.

S12.12 § 11. When an administration, in particular the administration of a developing country, requests assistance in the application of the Procedure, the Bureau shall take appropriate action, including, if need be, coordination of the requirements submitted by the requesting administration.

S12.13 § 12. The regional coordination groups should follow the coordination procedures prescribed in Section III. In the process of coordinating broadcasting requirements, an attempt shall be made to obtain agreement to the maximum number of submitted requirements with the quality level acceptable to administrations or broadcasters.

S12.14 § 13. In order to ensure maximum success from the Procedure, administrations and broadcasters shall show the utmost goodwill and mutual cooperation, and give due consideration to all the relevant technical and operational factors involved.

Section III. The Procedure

S12.15 The application of the Procedure shall be facilitated and coordinated by the Bureau as defined elsewhere in this Article.

S12.16 Twice yearly, administrations shall submit their projected seasonal broadcasting schedules in the relevant frequency bands to the Bureau. These schedules shall cover the following seasonal periods:

S12.17 Schedule A: Last Sunday in March to last Sunday in October

S12.18 Schedule B: Last Sunday in October to last Sunday in March

S12.19 Implementation of these schedules shall start at 0100 UTC

S12.20 If an administration considers it necessary to take account of propagation changes during the schedule period, it is recommended, for reasons of spectrum efficiency, that such requirements should be implemented on the following dates:

S12.21 First Sunday in May;

S12.22 First Sunday in September.

S12.23 Implementation of these changes shall start at 0100 UTC on these dates.

S12.24 Other start and stop dates within a schedule period may be used to accommodate requirements that have different schedule periods, e.g. special events, clock changes on different dates not coincident with the schedule period, etc.

S12.25 Administrations may include assignments in their schedules up to one year in advance of their use.

S12.26 In those cases where an administration does not indicate its requirements for a new seasonal schedule, the Bureau shall use the assignments from the previous corresponding seasonal schedule for this administration for the new schedule period. A note in the schedule shall be used to identify such requirements. The Bureau shall follow this practice for two consecutive schedule periods.

S12.27 Following the action taken in No. **S12.26**, the Bureau shall notify the administration concerned that the schedule will not include their broadcasting requirements unless the administration advises otherwise.

S12.28 When an administration decides to cease its broadcasting service in the HF bands, it shall notify the Bureau of that decision.

S12.29 The frequencies in the schedules should be those that will be used during the season concerned, and should be the minimum number required to provide satisfactory reception of the programmes in each of the areas and for each of the periods intended. In each schedule, to the maximum possible extent, the frequencies to be used in each reception area should remain unchanged from season to season.

S12.30 Administrations are encouraged to coordinate their schedules with other administrations as far as possible prior to submission. An administration may, on behalf of a group of administrations, submit their coordinated schedules, the frequencies of which shall however have no priority for use over those submitted by other administrations.

S12.31 The closing dates for receipt by the Bureau of the schedules relating to the two seasons referred to in No. **S12.17** and **S12.18** shall be established and published by the Bureau.

S12.32 The schedules shall be submitted with the relevant data as specified in Appendix **S4.**

S12.33 Upon receipt of the schedules, the Bureau shall, in accordance with the Rules of Procedure, validate the data where necessary, perform a compatibility analysis and prepare the tentative high-frequency broadcasting schedule (the Tentative Schedule). This Schedule shall include all assignments where administrations gave no alternatives, the selections made by the Bureau from any alternatives given, and the frequencies selected by the Bureau in cases where the need for its assistance was indicated by their intentional omission from the individual schedules.

S12.34 The Tentative Schedule shall be published at least two months before the start of each of the two schedule periods in Nos. **S12.17** and **S12.18**.

S12.35 Administrations should examine the Tentative Schedule and should coordinate their frequency schedules to resolve or to minimize, as far as possible, any incompatibilities identified by the compatibility analysis, or by the monitoring results of similar assignments, or by a combination of both.

S12.36 Coordination shall be achieved through bilateral or multilateral meetings of administrations or broadcasters or other means acceptable to the parties concerned.

S12.37 Administrations, either jointly or separately, shall inform the Bureau, as quickly as possible, but no later than two weeks prior to the start of the schedule period, of any changes to their requirements resulting from the coordination process. The Bureau shall prepare a new consolidated high-frequency broadcasting schedule (the Schedule), and shall perform a new compatibility analysis. The Bureau shall publish the Schedule and the results of the compatibility analysis at the start of the relevant broadcasting season.

S12.38 Administrations shall notify the Bureau of changes to their schedules as quickly as possible and the Bureau shall update and

make available the Schedule on a monthly basis. The Bureau shall perform new compatibility analyses and publish the updated Schedule and the results of these analyses every two months during the season.

S12.39 To facilitate the coordination process, the Bureau shall also forward the schedules to the regional coordination groups.

S12.40 Regional coordination groups should consider communicating with administrations and broadcasters through the use of any appropriate, mutually agreeable means, such as e-mail, news-groups, bulletin boards and other forms of electronic data transfer.

S12.41 Each regional coordination group should consider appointing a steering committee to ensure smooth progress of the coordination process.

S12.42 During and after the coordination process, the regional coordination groups shall exchange schedule data among themselves with a view to further enhancing the efficacy of the coordination process.

S12.43 One month after the end of a season, the Bureau shall publish the final high-frequency broadcasting schedule (the Final Schedule). If any changes have been notified to the Bureau since the previous consolidated Schedule, the Bureau shall also perform a compatibility analysis and publish it with the Final Schedule.

S12.44 The Bureau should, as and when required, convene joint meetings of the representatives of all the regional coordination groups to develop strategies for further reduction of incompatibilities and to discuss related matters. The outcome of these meetings shall be circulated among the regional groups and administrations.

S12.45 In a case of harmful interference, involving the application of the provisions of Article **S15**, administrations are urged to exercise the utmost goodwill and mutual cooperation, taking into account all the relevant technical and operational factors of the case.

SUP ARTICLE S12A

ARTICLE S13

Instructions to the Bureau

Section I. Assistance to Administrations by the Bureau

MOD **S13.1** When an administration has difficulty in applying the procedures of Articles **S9** and **S11** and Appendices **S30**, **S30A** and **S30B**, the Bureau shall, upon request, endeavour to assist in such cases.

SUP **S13.2** to **S13.4**

S13.5 to **S13.8** Not used.

NOC **S13.9** and **S13.10**

Section II. Maintenance of the Master Register and of World Plans by the Bureau

NOC **S13.11** and **S13.12**

ADD **S13.13**

b) whenever it appears from reliable information available that a recorded assignment has not been brought into regular operation in accordance with the notified required characteristics as specified in Appendix **S4**, or is not being used in accordance with those characteristics, the Bureau shall consult the notifying administration and, subject to its agreement or in the event of non-response after the dispatch of two consecutive reminders, each within a three-month period, shall either cancel, or suitably modify, or retain the basic characteristics of the entry. A decision of the Radiocommunication Bureau to cancel the entry in the event of non-response shall be confirmed by the Radio Regulations Board.

(MOD) **S13.14** *c)* enter in the Master Register and publish in the Preface to the International Frequency List (IFL) all frequencies prescribed by these Regulations for common use;

(MOD) **S13.15** *d)* make appropriate entries in the Master Register resulting from its examinations of frequency assignment notices in accordance with Article **S11**;

(MOD) **S13.16** *e)* maintain and periodically update the Preface to the IFL.

NOC **S13.17**

MOD **S13.17A** The Bureau shall maintain master copies of all world frequency allotment or assignment plans contained in appendices to these Regulations, or adopted by world conferences convened by the Union, including, where applicable, the carrier-to-interference ratios, or margins, as appropriate, associated with each assignment or allotment, and incorporating any modifications resulting from the successful application of the relevant modification procedure, and shall provide such copies in an appropriate form for publication by the Secretary-General when justified by circumstances.

NOC **S13.18** and **S13.19**

SUP **S13.20**

NOC **S13.21** to **S13.23**

ADD **Section IV. Board Documents**

ADD **S13.24** The Bureau shall, where appropriate, prepare draft modifications or additions to the Rules of Procedure which shall be made available for comment before being submitted to the Board. One week beforehand, the draft agenda of each Board meeting shall be sent by facsimile, or mailed, to all administrations and shall also be

made available in electronic form. At the same time, all documents which are both referred to in that draft agenda and available at that time shall be sent by facsimile, or mailed, to those administrations requesting them as well as simultaneously being made accessible in electronic form.

ADD **S13.25** Within one week after a meeting of the Board, a summary of all decisions taken in that meeting, as well as the approved minutes of the preceding meeting, shall be published. These shall be circulated to administrations by means of a circular-letter from the Bureau and then made available in electronic form.

ADD **S13.26** A copy of all documents considered at the Board's meetings, including the minutes, shall be available for public inspection by administrations in the offices of the Bureau and be available in electronic form.

ARTICLE S14

Procedure for the Review of a Finding or Other Decision of the Bureau

NOC **S14.1**
MOD **S14.2** For this purpose, the administration concerned shall submit a request for a review to the Bureau; it shall also cite the relevant provisions of the Radio Regulations and other references and shall state the action it seeks.

NOC **S14.3**

MOD **S14.4** If the outcome of the review successfully resolves the matter with the requesting administration without adversely affecting the interests of other administrations, the Bureau shall publish an outline of the review, the arguments, the settlement and any implications affecting other administrations for the information of all Members of the Union. If this review results in a modification to a

finding previously formulated by the Bureau, the Bureau shall re-apply the relevant steps of the procedure under which the previous finding had been formulated, including, if appropriate, removal of the corresponding entries from the Master Register or any consequential effect on notices subsequently received by the Bureau.

NOC **S14.5** to **S14.7A**

SUP **S14.8** and **S14.9**

ARTICLE S19

Identification of Stations

Section I. General Provisions

NOC **S19.1** to **S19.27**

MOD **S19.28** § 11. Each Member State reserves the right to establish its own measures for identifying its stations used for national defence. However, it shall use, as far as possible, call signs recognizable as such, and containing the distinctive characters of its nationality.

Section II. Allocation of International Series and Assignment of Call Signs

ADD **S19.28A** § 11A. (1) For the purpose of the supply of identification signals, a *territory or geographical area* shall be understood to mean the territory within the limits of which the station is located. For mobile stations, it shall be understood to mean the territory within the limits of which the responsible administration is located. A territory which does not have full responsibility for its international relations shall also be considered as a geographical area for this purpose.

ADD **S19.28B** (2) In all documents of the Union where the terms *allocation of call sign series* and *assignment of call signs* are to be used, they shall be used with the following meaning:

Identification means	Terms used in these Regulations
International series of call signs (including maritime identification digits (MIDs) and selective call numbers)	Allocation to the administration of a Member State (see definition in No. 1002 of the Constitution)
Call signs (including maritime identification digits (MIDs) and selective call numbers)	Assignment by any administration to stations operating in a territory or geographical area (see No. **S19.28A**)

MOD **S19.29** § 12. (1) All stations open to international public correspondence, all amateur stations, and other stations which are capable of causing harmful interference beyond the boundaries of the territory or geographical area in which they are located, shall have call signs from the international series allocated to its administration as given in the Table of Allocation of International Call Sign Series in Appendix **S42**.

NOC **S19.30** to **S19.33**

MOD **S19.34** § 15. The Secretary-General shall be responsible for allocating maritime identification digits (MIDs) to administrations and shall regularly publish information regarding allocated MIDs.

SUP **S19.34.1**

MOD **S19.35** § 16. The Secretary-General shall be responsible for allocating additional maritime identification digits (MIDs) to administrations within the limits specified[2], provided that he is satisfied that the possibilities offered by the MIDs allocated to an administration will soon be exhausted despite judicious ship station identity assignment as outlined in Section VI, which should be in conformity with the relevant ITU-R and ITU-T Recommendations.

SUP **S19.35.1**

MOD **S19.35.2** [2] In no circumstances may an administration claim more MIDs than the total number of its ship stations shown in the ITU List of Ship Stations (List V) divided by 1000.

MOD **S19.36** § 17. A single maritime identification digit (MID) has been allocated initially to each administration. A second MID should not be requested unless the first MID allocated is more than 80% exhausted in the basic category of three trailing zeros and the rate of assignments is such that 90% exhaustion is foreseen. The same criteria should be applied to subsequent requests for MIDs.

NOC **S19.37**

MOD **S19.38** § 19. (1) Each administration shall choose the call signs and, if the selective calling system used is in accordance with Recommendation ITU-R M.257-3, the ship station selective call numbers and the coast station identification numbers of its stations from the international series allocated or supplied to it; and shall notify this information to the Secretary-General together with the information which is to appear in Lists I, IV, V, VI and VIIIA. These notifications do not include call signs assigned to amateur and experimental stations.

MOD **S19.39** (2) Each administration shall choose the maritime mobile service identities of its stations from the maritime identification digits allocated to it and notify this information to the Secretary-General for inclusion in the relevant lists, as provided for in Article **S20**.

NOC **S19.40** to **S19.82**

Section V. Selective Call Numbers in the Maritime Mobile Service

NOC **S19.83** to **S19.95**

MOD **S19.96** (2) Each administration shall choose the selective call numbers to be assigned to its ship stations from the blocks of the series supplied to it. Administrations shall notify the Radiocommunication Bureau immediately in accordance with No. **S20.16** when assigning selective call numbers to ship stations.

ADD **S19.96A** (2A) Five-digit ship station selective call numbers are assigned to sequential single frequency selective calling (SSFC) equipment (as described in Recommendation ITU-R M.257-3) for calling in radiotelephony and for the phasing in of narrow-band direct printing (NBDP) equipment (as described in Recommendation ITU-R M.476-5). Within one administration the same five-digit number may be used:

– for identification of ship stations fitted with both SSFC and NBDP equipment;

– for identification of ship stations of two different ships fitted with either SSFC or NBDP equipment only.

NOC **S19.97**

Section VI. Maritime Mobile Service Identities in the Maritime Mobile Service and the Maritime Mobile-Satellite Service

NOC **S19.98** *A. General*

MOD **S19.99** § 39. When a station[1] in the maritime mobile service or the maritime mobile-satellite service is required to use maritime mobile service identities, the responsible administration shall assign the identity to the station in accordance with the provisions described in Nos. **S19.100** to **S19.126**; in so doing, it should take into account the relevant ITU-R and ITU-T Recommendations. In accordance with No. **S20.16,** administrations shall notify the Radiocommunication Bureau immediately when assigning maritime mobile service identities.

NOC **S19.99.1** to **S19.106**

SUP **S19.107**

NOC **S19.108** to **S19.118** *D. Group Ship Station Call Identities*

NOC **S19.119**

MOD **S19.120** (2) The MID represents only the territory or geographical area of the administration assigning the group ship station call identity and does not therefore prevent group calls to fleets containing more than one ship nationality.

NOC **S19.121** *E. Coast Station Identities*

NOC **S19.122**

MOD **S19.123** (2) The MID reflects the territory or geographical area in which the coast station or coast earth station is located.

NOC **S19.124** *F. Group Coast Station Call Identities*

NOC **S19.125**

MOD **S19.126** (2) The MID represents only the territory or geographical area of the administration assigning the group coast station call identity. The identity may be assigned to stations of one administration which are located in only one geographical region as indicated in the relevant ITU-T Recommendations.

NOC **S19.127** to **S19.131**

ARTICLE S21

Terrestrial and Space Services Sharing Frequency Bands Above 1 GHz

NOC **S21.1** to **S21.15**

Section V. Limits of Power Flux-Density from Space Stations

NOC **S21.16**
MOD

TABLE **S21-4**

Frequency band	Service	Limit in dB(W/m^2) for angle of arrival δ above the horizontal plane			Reference bandwidth
		0°-5°	5°-25°	25°-90°	
…					
7 250-7 850 MHz	Meteorological-satellite (space-to-Earth)	–152	–152 + 0.5 (δ – 5)	–142	4 kHz
…					
10.7-11.7 GHz	Fixed-satellite (space-to-Earth)	–150[8)]	–150 + 0.5(δ – 5)[8)]	–140[8)]	4 kHz
12.2-12.5 GHz (Region 3) 12.5-12.75 GHz (Region 1 and Region 3 countries listed in Nos. **S5.494** and **S5.496**)	Fixed-satellite (space-to-Earth)	–148[8)]	–148 + 0.5(δ – 5)[8)]	–138[8)]	4 kHz

TABLE **S21-4** *(end)*

Frequency band	Service	Limit in dB(W/m^2) for angle of arrival δ above the horizontal plane			Reference bandwidth
		0°-5°	5°-25°	25°-90°	
15.43-15.63 GHz	Fixed-satellite (space-to-Earth)	–127	5°-20°: -127 20°-25°: –127 + 0.56 (δ – 20)^2	25°-29°: –113 29°-31°: –136.9 + 25 log (δ – 20) 31°-90°: –111	1 MHz
11.7-12.5 GHz (Region 1) 12.2-12.7 GHz (Region 2) 11.7-12.2 GHz (Region 3) 11.7-12.2 GHz (Region 2)	Fixed-satellite (space-to-Earth), non-geostationary-satellite orbit	–148[9)]	–148 + 0.5(δ – 5)[9)]	–138[9)]	–138[9)]
17.7-19.3 GHz[1)2)]	Fixed-satellite (space-to-Earth)	–115 or –125[6)]	–115 + 0.5 (δ – 5) or –125 + (δ – 5)[6)]	–105 or –105[6)]	1 MHz
19.3-19.7 GHz	Fixed-satellite (space-to-Earth)	–115	–115 + 0.5 (δ – 5)	–105	1 MHz

NOC **S21.16.1**

MOD **S21.16.2**

2) The band 18.6-18.8 GHz is allocated to the earth exploration-satellite (passive) and space research (passive) services. Administrations should endeavour to reduce to a minimum the risks of interference to passive sensors. The interference criteria for satellite passive sensors are contained in Recommendation ITU-R SA.1029.

NOC **S21.16.3** to **S21.16.5**

MOD **S21.16.6** 6) These values shall apply provisionally only to emissions of space stations on non-geostationary satellites in networks operating with a large number of satellites, that is systems operating with more than 100 satellites (see Resolution **131 (WRC-97)**).

NOC **S21.16.7**

ADD **S21.16.8** 8) Although these limits apply to both geostationary and non-geostationary satellites in the fixed-satellite service, values for non-geostationary-satellite systems require further study (see Resolution **131 (WRC-97)**).

ADD **S21.16.9** 9) These values require further study (see Resolution **131 (WRC-97)**).

NOC **S21.17**

ARTICLE S22

Space Services[1]

NOC **A.S22.1** and **S22.1**

Section II. Control of Interference to Geostationary-Satellite Systems

MOD **S22.2** § 2. (1) Non-geostationary-satellite systems shall not cause unacceptable interference to geostationary-satellite systems in the fixed-satellite service and the broadcasting-satellite service operating in accordance with these Regulations.

NOC **S22.3** to **S22.5**

MOD **S22.5A** § 5. In the frequency band 6 700-7 075 MHz, the maximum aggregate power flux-density produced at the geostationary-satellite orbit and within ±5° of inclination around the geostationary-satellite orbit by a non-geostationary-satellite system in the fixed-satellite service shall not exceed -168 dB(W/m^2) in any 4 kHz band. The maximum aggregate power flux-density shall be calculated in accordance with Recommendation ITU-R S.1256.

ADD **S22.5B** In the frequency band 17.8-18.1 GHz, the maximum aggregate power flux-density produced at the geostationary-satellite orbit by all the space stations in a non-geostationary-satellite system in the fixed-satellite service shall not exceed the values given in Table **S22-2**.

ADD **S22.5C** § 6. (1) The equivalent power flux-density[1], at any point on the Earth's surface visible from the geostationary-satellite orbit, produced by emissions from all the space stations of a non-geostationary-satellite system in the fixed-satellite service in the frequency bands listed in Table **S22-1**, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall not exceed the limits given in Table **S22-1** for the given percentages of time. These limits relate to the equivalent power flux-density which would be obtained under free-space propagation conditions, into a reference antenna and in the reference bandwidth specified in Table **S22-1**, for all pointing directions towards the geostationary-satellite orbit.

ADD **S22.5C.1** [1] The equivalent power flux-density is defined as the sum of the power flux-densities produced at a point on the Earth's surface by all space stations within a non-geostationary-satellite system, taking into account the off-axis discrimination of a reference receiving antenna assumed to be pointing towards the geostationary-satellite orbit. The equivalent power flux-density is calculated using the following formula:

$$epfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N_s} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{max}}\right]$$

where:

N_s: number of non-geostationary space stations visible from the point considered at the Earth's surface, within an elevation angle greater than or equal to 0°;

i: index of the non-geostationary space station considered;

pfd_i: power flux-density produced at the point considered on the Earth's surface in dB(W/m^2) in the reference bandwidth;

θ_i: angle between the direction considered towards the geostationary-satellite orbit and the direction of the interfering space station in the non-geostationary-satellite system;

$G_r(\theta_i)$: gain (as a ratio) of the receive reference antenna to be considered as part of a geostationary-satellite network;

G_{max}: maximum gain (as a ratio) of the above receive reference antenna;

epfd: computed equivalent power flux-density in dB(W/m^2) in the reference bandwidth.

NOTE – Tables **S22-1** to **S22-4** and Nos. **S22.26** to **S22.29** contain provisional limits corresponding to an interference level caused by one non-geostationary fixed-satellite service system in the frequency bands to be applied in accordance with Resolutions **130 (WRC-97)** and **538 (WRC-97)**. These provisional limits are subject to review by ITU-R and are subject to confirmation by the 1999 World Radio-communication Conference.

ADD

TABLE **S22-1**

Frequency band allocated to the broadcasting-satellite service	Antenna diameter (cm)	Equivalent pfd level ($dB(W/m^2/4kHz)$) which may not be exceeded during the percentage of time shown		Reference antenna radiation pattern
		99.7%	100%	
11.7-12.5 GHz in Region 1, 11.7-12.2 GHz and 12.5-12.75 GHz in Region 3	30 60 90	–172.3 –183.3 –186.8	–169.3 –170.3 –170.3	Recommendation ITU-R BO.1213
12.2-12.7 GHz in Region 2	45 100 120 180	–174.3 –186.3 –187.9 –191.4	–165.3 –170.3 –170.3 –170.3	§ 3.7.2 of Annex 5 of Appendix **S30**
17.3-17.8 GHz in Region 2	For further study[1)]			

[1)] The interference from non-geostationary fixed-satellite service (non-GSO FSS) systems into geostationary broadcasting-satellite service (GSO BSS) systems operating in the frequency bands 17.3-17.8 GHz relates to the two following sharing situations:

– non-GSO FSS transmit earth station into GSO receive earth station;

– GSO BSS transmit space station into non-GSO FSS receive space stations.

Both situations need to be studied, in particular since coexistence of receive BSS earth stations and large numbers of transmit non-GSO FSS terminals would not be feasible within the same country

ADD **S22.5D** (2) The aggregate power flux-density[2] produced at any point in the geostationary-satellite orbit by emissions from all the earth stations in a non-geostationary-satellite system in the fixed-satellite service, for all conditions and for all methods of modulation, shall not exceed the limits given in Table **S22-2** for the specified percentages of time. These limits relate to the power flux-density which would be obtained under free-space propagation conditions in the reference bandwidth specified in Table **S22-2**.

ADD **S22.5D.1** [2] The aggregate power flux-density is defined as the sum of the power flux-densities produced at a point in the geostationary-satellite orbit by all the earth stations of a non-geostationary-satellite system. The aggregate power flux-density is computed by means of the following formula:

$$apfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N_e} 10^{P_i/10} \cdot \frac{G_t(\theta_i)}{4\,\pi\,{d_i}^2}\right]$$

where:

N_e: number of earth stations in the non-geostationary-satellite system with an elevation angle greater than or equal to 0°, from which the point considered in the geostationary-satellite orbit is visible;

i: index of the earth station considered in the non-geostationary-satellite system;

P_i: RF power at the input of the transmitting antenna of the earth station considered in the non-geostationary-satellite system in dBW in the reference bandwidth;

θ_i: off-axis angle between the boresight of the earth station considered in the non-geostationary-satellite system and the direction of the point considered in the geostationary-satellite orbit;

$G_t(\theta_i)$: transmit antenna gain (as a ratio) of the earth station considered in the non-geostationary-satellite system in the direction of the point considered in the geostationary-satellite orbit;

d_i: distance in metres between the earth station considered in the non-geostationary-satellite system and the point considered in the geostationary-satellite orbit;

apfd: aggregate power flux-density in dB(W/m^2) in the reference bandwidth.

NOTE – Tables **S22-1** to **S22-4** and Nos. **S22.26** to **S22.29** contain provisional limits corresponding to an interference level caused by one non-geostationary fixed-satellite service system in the frequency bands to be applied in accordance with Resolutions **130 (WRC-97)** and **538 (WRC-97)**. These provisional limits are subject to review by ITU-R and are subject to confirmation by the 1999 World Radiocommunication Conference.

ADD

TABLE **S22-2**

Frequency band (GHz)	Aggregate pfd dB(W/m^2/4 kHz)	Percentage of time during which aggregate pfd level may not be exceeded
17.3-18.1 in Regions 1 and 3 and 17.8-18.1 in Region 2	–163	100%

ADD **S22.5E** (3) The equivalent power flux-density[1], at any point on the Earth's surface visible from the geostationary-satellite orbit, produced by emissions from all the space stations of a non-geostationary-satellite system in the fixed-satellite service in the frequency bands listed in Table **S22-3**, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall not exceed the limits given in Table **S22-3** for the given percentages of time. These limits relate to the equivalent power flux-density which would be obtained under free-space propagation conditions into all the reference antennas and in the reference bandwidths specified in Table **S22-3**, and for all pointing directions towards the geostationary-satellite orbit.

ADD **S22.5E.1** [1] The equivalent power flux-density is defined as the sum of the power flux-densities produced at a point on the Earth's surface by all space stations within a non-geostationary-satellite system, taking into account the off-axis discrimination of a reference receiving antenna assumed to be pointing towards the geostationary-satellite orbit. The equivalent power flux-density is calculated using the following formula:

$$epfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N_s} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{max}}\right]$$

where:

N_s: number of non-geostationary space stations visible from the point considered at the Earth's surface, within an elevation angle greater than or equal to 0°;

i: index of the non-geostationary space station considered;

pfd_i: power flux-density produced at the point considered on the Earth's surface in dB(W/m^2) in the reference bandwidth;

θ_i: angle between the direction considered towards the geostationary-satellite orbit and the direction of the interfering space station in the non-geostationary-satellite system;

$G_r(\theta_i)$: gain (as a ratio) of the receive reference antenna to be considered as part of a geostationary-satellite network;

G_{max}: maximum gain (as a ratio) of the above receive reference antenna;

epfd: computed equivalent power flux-density in dB(W/m^2) in the reference bandwidth.

NOTE – Tables **S22-1** to **S22-4** and Nos. **S22.26** to **S22.29** contain provisional limits corresponding to an interference level caused by one non-geostationary fixed-satellite service system in the frequency bands to be applied in accordance with Resolutions **130 (WRC-97)** and **538 (WRC-97)**. These provisional limits are subject to review by ITU-R and are subject to confirmation by the 1999 World Radio-communication Conference.

ADD

TABLE **S22-3**

PART A

Frequency band (GHz)	Equivalent pfd dB(W/m^2)	Percentage of time during which equivalent pfd level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern
10.7-11.7,	–179	99.7	4	60 cm, Rec. ITU-R S.465-5
11.7-12.2 in Region 2,	–192	99.9	4	3 m, Rec. ITU-R S.465-5
	–186	99.97	4	3 m, Rec. ITU-R S.465-5
12.2-12.5 in Region 3	–195	99.97	4	10 m, Rec. ITU-R S.465-5
12.5-12.75 in Regions 1 and 3	–170	99.999	4	60 cm, Rec. ITU-R S.465-5
	–173	99.999	4	3 m, Rec. ITU-R S.465-5
	–178	99.999	4	10 m, Rec. ITU-R S.465-5
	–170	100	4	≥ 60 cm, Rec. ITU-R S.465-5

TABLE **S22-3**

PART B

Frequency band (GHz)	Equivalent pfd $dB(W/m^2)$	Percentage of time during which equivalent pfd level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern
17.8-18.6	–165 –151	99.0	40 1000	30 cm, Rec. ITU-R S.465-5
	–165 –151	99.0	40 1000	70 cm, Rec. ITU-R S.465-5
	–165 –151	99.5	40 1000	90 cm, Rec. ITU-R S.465-5
	–167 –153	99.8	40 1000	1.5 m, Rec. ITU-R S.465-5
	–180 –166	99.9	40 1000	5 m, Rec. ITU-R S.465-5
	–184 –170	99.9	40 1000	7.5 m, Rec. ITU-R S.465-5
	–188 –174	99.9	40 1000	12 m, Rec. ITU-R S.465-5
	–165 –151	100	40 1000	30 cm to 12 m, Rec. ITU-R S.465-5
19.7-20.2	–154 –140	99.0	40 1000	30 cm, Rec. ITU-R S.465-5
	–164 –150	99.9	40 1000	90 cm, Rec. ITU-R S.465-5
	–167 –153	99.8	40 1000	2 m, Rec. ITU-R S.465-5
	–174 –160	99.9	40 1000	5 m, Rec. ITU-R S.465-5
	–154 –140	100	40 1000	30 cm to 12 m, Rec. ITU-R S.465-5

ADD **S22.5F** (4) The aggregate power flux-density[2] produced at any point in the geostationary-satellite orbit by emissions from all the earth stations in a non-geostationary-satellite system in the fixed-satellite service, for all conditions and for all methods of modulation, shall not exceed the limits given in Table **S22-4** for any percentage of time. These limits relate to the power flux-density which would be obtained under free-space propagation conditions in the reference bandwidth specified in Table **S22-4**.

ADD **S22.5F.1** [2] The aggregate power flux-density is defined as the sum of the power flux-densities produced at a point in the geostationary-satellite orbit by all the earth stations of a non-geostationary-satellite system. The aggregate power flux-density is computed by means of the following formula:

$$apfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N_e} 10^{P_i/10} \cdot \frac{G_t(\theta_i)}{4\,\pi\,{d_i}^2}\right]$$

where:

N_e: number of earth stations in the non-geostationary-satellite system with an elevation angle greater than or equal to 0°, from which the point considered in the geostationary-satellite orbit is visible;

i: index of the earth station considered in the non-geostationary-satellite system;

P_i: RF power at the input of the transmitting antenna of the earth station considered in the non-geostationary-satellite system in dBW in the reference bandwidth;

θ_i: off-axis angle between the boresight of the earth station considered in the non-geostationary-satellite system and the direction of the point considered in the geostationary-satellite orbit;

$G_t(\theta_i)$: transmit antenna gain (as a ratio) of the earth station considered in the non-geostationary-satellite system in the direction of the point considered in the geostationary-satellite orbit;

d_i: distance in metres between the earth station considered in the non-geostationary-satellite system and the point considered in the geostationary-satellite orbit;

apfd: aggregate power flux-density in dB(W/m^2) in the reference bandwidth.

NOTE – Tables **S22-1** to **S22-4** and Nos. **S22.26** to **S22.29** contain provisional limits corresponding to an interference level caused by one non-geostationary fixed-satellite service system in the frequency bands to be applied in accordance with Resolutions **130 (WRC-97)** and **538 (WRC-97)**. These provisional limits are subject to review by ITU-R and are subject to confirmation by the 1999 World Radiocommunication Conference

ADD

TABLE **S22-4**

PART A

Frequency band (GHz)	Aggregate pfd dB(W/m^2)	Percentage of time during which aggregate pfd level may not be exceeded	Reference bandwidth (kHz)
12.5-12.75	–170	100	4
12.75-13.25 and	–186	100	4
13.75-14.5	–170	100	4

TABLE **S22-4**

PART B

Frequency band (GHz)	Aggregate pfd dB(W/m^2)	Percentage of time during which aggregate pfd level may not be exceeded	Reference bandwidth (kHz)
27.5-28.6 and	–159	100	40
29.5-30	–145	100	1 000

ADD **S22.5G** The limits given in Tables **S22-1** and **S22-3** may be exceeded on the territory of any country whose administration has so agreed.

NOC **S22.III.1** to **S22.25**

Section VI. Earth Station Off-Axis Power Limitations in the Fixed-Satellite Service[1]

ADD **S22.VI.1** [1] The provisions of this section are suspended pending the review of the values in Nos. **S22.26**, **S22.27** and **S22.28** by the 1999 World Radiocommunication Conference.

MOD **S22.26** § 9. The level of equivalent isotropically radiated power (e.i.r.p.) emitted by an earth station shall not exceed the following values for any off-axis angle φ which is 2.5° or more off the main-lobe axis of an earth station antenna:

Off-axis angle	*Maximum e.i.r.p.*
$2.5° \le \varphi \le 7°$	(39 – 25 log φ) dB(W/40 kHz)
$7° < \varphi \le 9.2°$	18 dB(W/40 kHz)
$9.2° < \varphi \le 48°$	(42 – 25 log φ) dB(W/40 kHz)
$48° < \varphi \le 180°$	0 dB(W/40 kHz)

ADD **S22.27** For FM-TV emissions with energy dispersal, the limits in No. **S22.26** above may be exceeded by up to 3 dB provided that the off-axis total e.i.r.p. of the transmitted FM-TV carrier does not exceed the following values:

Off-axis angle	*Maximum e.i.r.p.*
$2.5° \le \varphi \le 7°$	$(53 - 25 \log \varphi)$ dBW
$7° < \varphi \le 9.2°$	32 dBW
$9.2° < \varphi \le 48°$	$(56 - 25 \log \varphi)$ dBW
$48° < \varphi \le 180°$	14 dBW

ADD **S22.28** FM-TV carriers which operate without energy dispersal should be modulated at all times with programme material or appropriate test patterns. In this case, the off-axis total e.i.r.p. of the emitted FM-TV carrier shall not exceed the following values:

Off-axis angle	*Maximum e.i.r.p.*
$2.5° \le \varphi \le 7°$	$(53 - 25 \log \varphi)$ dBW
$7° < \varphi \le 9.2°$	32 dBW
$9.2° < \varphi \le 48°$	$(56 - 25 \log \varphi)$ dBW
$48° < \varphi \le 180°$	14 dBW

ADD **S22.29** The e.i.r.p. limits given in Nos. **S22.26**, **S22.27** and **S22.28** are applicable in the following frequency bands allocated to the fixed-satellite service (Earth-to-space):

12.75-13.25 GHz

13.75-14 GHz

14-14.5 GHz

ARTICLE S23

Broadcasting Services

NOC **S23.1** to **S23.12**

Section II. Broadcasting-Satellite Service

MOD **S23.13** § 4. In devising the characteristics of a space station in the broadcasting-satellite service, all technical means available shall be used to reduce, to the maximum, the radiation over the territory of other countries unless an agreement has been previously reached with such countries.

ARTICLE S30

General Provisions

Section I. Introduction

MOD **S30.1** § 1. This Chapter contains the provisions for the operational use of the Global Maritime Distress and Safety System (GMDSS), which is fully defined in the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended. Distress, urgency and safety transmissions may also be made, using Morse telegraphy or radiotelephony techniques, in accordance with the provisions of Appendix **S13** and relevant ITU-R Recommendations. Stations of the maritime mobile service, when using frequencies and techniques in conformity with Appendix **S13**, shall comply with the appropriate provisions of that Appendix.

NOC **S30.2** to **S30.13**

ARTICLE S31

Frequencies for the Global Maritime Distress and Safety System (GMDSS)

Section I. General

MOD **S31.1** § 1. The frequencies to be used for the transmission of distress and safety information under the GMDSS are contained in Appendix **S15**. In addition to the frequencies listed in Appendix **S15**, coast stations should use other appropriate frequencies for the transmission of safety messages.

NOC **S31.2** to **S31.11**

Section III. Watchkeeping

NOC **S31.12** to **S31.15**

ADD **S31.16** *C. Ship Stations*

MOD **S31.17** § 8. (1) Ship stations, where so equipped, shall, while at sea, maintain an automatic digital selective calling watch on the appropriate distress and safety calling frequencies in the frequency bands in which they are operating. Ship stations, where so equipped, shall also maintain watch on the appropriate frequencies for the automatic reception of transmissions of meteorological and navigational warnings and other urgent information to ships. However, ship stations shall also continue to apply the appropriate watch-keeping provisions of Appendix **S13** (see Resolution **331 (Rev.WRC-97)**).

NOC **S31.18** to **S31.19**

MOD **S31.20** § 9. Ship earth stations complying with the provisions of this Chapter shall, while at sea, maintain watch except when communicating on a working channel.

ARTICLE S32

Operational Procedures for Distress and Safety Communications in the Global Maritime Distress and Safety System (GMDSS)

Section I. General

NOC **S32.1** to **S32.5**

ADD **S32.5A** § 4A. Each administration shall ensure that suitable arrangements are made for assigning and registering identities used by ships participating in the GMDSS, and shall make registration information available to rescue coordination centres on a 24-hour day, 7-day week basis. Where appropriate, administrations shall notify responsible organizations immediately of additions, deletions and other changes in these assignments (see Nos. **S19.39, S19.96** and **S19.99**). Registration information shall be in accordance with Resolution **340 (WRC-97)**.

ADD **S32.5B** Any GMDSS shipboard equipment which is capable of transmitting position coordinates as part of a distress alert message and which does not have an integral electronic position-fixing system receiver shall be interconnected to a separate navigation receiver, if one is installed, to provide that information automatically.

NOC **S32.6** to **S32.7.1**

Section II. Distress Alerting

NOC **S32.8**

MOD **S32.9** § 7. (1) The transmission of a distress alert indicates that a mobile unit[1] or person[2] is threatened by grave and imminent danger and requests immediate assistance. The distress alert is a digital selective call using a distress call format[3] in the bands used for terrestrial radiocommunication or a distress message format, in which case it is relayed through space stations.

NOC **S32.9.1** to **S32.10.1**

ADD **S32.10A** § 7A. A distress alert is false if it was transmitted without any indication that a mobile unit or person was in distress and required immediate assistance (see No. **S32.9**). Administrations receiving a false distress alert shall report this infringement in accordance with Section V of Article **S15**, if that alert:

a) was transmitted intentionally;

b) was not cancelled in accordance with Resolution **349 (WRC-97)**;

c) could not be verified as a result of either the ship's failure to keep watch on appropriate frequencies in accordance with Nos. **S31.16** to **S31.20**, or its failure to respond to calls from an authorized rescue authority;

d) was repeated; or

e) was transmitted using a false identity.

Administrations receiving such a report shall take appropriate steps to ensure that the infringement does not recur. No action should normally be taken against any ship or mariner for reporting and cancelling a false distress alert.

NOC **S32.11** to **S32.64**

ARTICLE S33

Operational Procedures for Urgency and Safety Communications in the Global Maritime Distress and Safety System (GMDSS)

NOC **S33.1** to **S33.38**

Section V. Transmission of Maritime Safety Information[1]

ADD **S33.V.1**

[1] Maritime safety information includes navigation and meteorological warnings, meteorological forecasts and other urgent messages pertaining to safety normally transmitted to or from ships, between ships and between ship and coast stations or coast earth stations.

NOC **S33.39**

A. General

ADD **S33.39A** § 20A. (1) Messages from ship stations containing information concerning the presence of cyclones shall be transmitted, with the least possible delay, to other mobile stations in the vicinity and to the appropriate authorities at the first point of the coast with which contact can be established. These transmissions shall be preceded by the safety signal.

ADD **S33.39B** (2) Messages from ship stations containing information on the presence of dangerous ice, dangerous wrecks, or any other imminent danger to marine navigation, shall be transmitted as soon as possible to other ships in the vicinity, and to the appropriate authorities at the first point of the coast with which contact can be established. These transmissions shall be preceded by the safety signal.

NOC **S33.40** to **S33.53**

ADD

Section VIII. Medical Advice

ADD **S33.54** § 29. (1) Mobile stations requiring medical advice may obtain it through any of the land stations shown in the List of Radiodetermination and Special Service Stations.

ADD **S33.55** (2) Communications concerning medical advice may be preceded by the urgency signal.

ARTICLE S48

Personnel

NOC **S48.1**

Section II. Class and Minimum Number of Personnel for Ship Stations and Ship Earth Stations

NOC **S48.2** to **S48.6**

MOD **S48.7** § 5. The personnel of ship stations and ship earth stations for which a radio installation is not compulsory either under international agreements or national regulations and which use the frequencies and techniques prescribed in Chapter **SVII** shall be adequately qualified and certificated in accordance with the administration's requirements. Guidance concerning appropriate qualifications and certification is provided in Resolution **343 (WRC-97)**. That Resolution describes two appropriate certificates for use by personnel of ship stations and ship earth stations for which a radio installation is not compulsory.

ARTICLE S51

Conditions to be observed in the Maritime Services

Section I. Maritime Mobile Service

NOC **S51.1** to **S51.49**

NOC **S51.50** *D. Ship Stations Using Radiotelephony*

NOC **S51.51** and **S51.52**

MOD **S51.53** *a)* send class J3E emissions on a carrier frequency of 2 182 kHz and receive class J3E emissions on a carrier frequency of 2 182 kHz, except for such apparatus as is referred to in No. **S51.56** (see also Appendix **S13**);

NOC **S51.54** to **S51.80**

ARTICLE S52

Special Rules Relating to the Use of Frequencies

Section I. General Provisions

NOC **S52.1** *A. Single-Sideband Radiotelegraph Transmissions*

NOC **S52.2**

MOD **S52.3** (2) Where these provisions specify class F1B emission, class J2B and J2D emissions shall be considered equivalent. However, class J2D emission shall not be used with the HF distress and safety frequencies listed in Appendix **S15**.

NOC **S52.4** *B. Bands Between 415 kHz and 535 kHz*

NOC **S52.5** and **S52.6**

MOD **S52.7** (2) From 1 February 1999, in the maritime mobile service, the frequency 490 kHz is used exclusively for the transmission by coast stations of meteorological and navigational warnings and urgent information to ships by means of narrow-band direct-printing telegraphy.

NOC **S52.8** to **S52.15**

Section II. Use of Frequencies for Morse Radiotelegraphy

NOC **S52.16** to **S52.52**

NOC **S52.53** *D. Bands Between 4 000 kHz and 27 500 kHz*

D1. General

MOD **S52.54** § 19. (1) Ship Morse radiotelegraph stations equipped to operate in the bands specified in Appendix **S17,** Part B, Sections IV and V, shall employ the classes of emission mentioned in No. **S52.2** for Morse telegraphy at speeds not exceeding 40 bauds. Survival craft stations may use class A2A or H2A emissions in these bands (see Appendix **S13**)[6].

ADD **S52.54.1**

[6] Additionally, use of class J2B and J2D emissions are permitted on a non-interference basis to A1A Morse operations. However, these emissions shall not be used on the HF safety and distress frequencies listed in Appendix **S15**.

MOD **S52.55** (2) Except as provided for in Nos. **S52.222.1** and **S52.54.1**, coast Morse radiotelegraph stations operating in the bands exclusively allocated to the maritime mobile service between 4 000 kHz and 27 500 kHz shall not use Type 2 emissions (see No. **S52.18**).

NOC **S52.56** to **S52.175**

Section VI. Use of Frequencies for Radiotelephony

NOC **S52.176** to **S52.181**

NOC **S52.182** *B. Bends between 1605 kHz and 4000 kHz*

NOC **S52.183** to **S52.188**

B2. Call and Reply

MOD **S52.189** § 87. (1) The frequency 2 182 kHz[1] is an international distress frequency for radiotelephony (see Appendix **S13** for details of its use for distress, urgency, safety and emergency position-indicating radiobeacon (EPIRB) purposes).

NOC **S52.189.1** to **S52.215**

NOC **S52.216** *C. Bands Between 4 000 kHz and 27 500 kHz*

C1. Mode of Operation of Stations

MOD **S52.217** § 96. (1) The class of emission to be used for analogue radiotelephony in the bands between 4 000 kHz and 27 500 kHz shall be J3E; for digital telecommunications in those bands, the class of emission shall be J2D.

NOC **S52.218**

MOD **S52.219** (3) Coast stations employing class J3E or J2D emissions in accordance with No. **S52.217** in the bands between 4 000 kHz and 27 500 kHz shall use the minimum power necessary to cover their service area and shall at no time use a peak envelope power in excess of 10 kW per channel.

MOD **S52.220** (4) Ship stations employing class J3E or J2D emissions in accordance with No. **S52.217** in the bands between 4 000 kHz and 27 500 kHz shall at no time use a peak envelope power in excess of 1.5 kW per channel.

NOC **S52.221** to **S52.260**

ARTICLE S53

Order of Priority of Communications

MOD **S53.1** § 1. All stations in the maritime mobile service and the maritime mobile-satellite service shall be capable of offering four levels of priority in the following order:

(1) Distress calls, distress messages, and distress traffic.

(2) Urgency communications.

(3) Safety communications.

(4) Other communications.

SUP **S53.1.1** and **S53.1.2**

ADD **S53.2** § 2. In a fully automated system, where it is impracticable to offer all four levels of priority, category 1 shall receive priority until such time as intergovernmental agreements[1] remove exemptions granted for such systems from offering the complete order of priority.

ADD **S53.2.1** [1] Requirements and performance standards for radio systems and equipment for maritime distress and safety radiocommunications are developed and adopted by the International Maritime Organization (IMO).

ARTICLE S59

Provisional Application of the Radio Regulations

MOD **S59.1** These Regulations, which complement the provisions of the Constitution and Convention of the International Telecommunication Union (Geneva, 1992), and as revised and contained in the Final Acts of the World Radiocommunication Conferences (Geneva, 1995 and Geneva, 1997), shall have provisional application, pursuant to Article 54 of the Constitution, on the following basis.

MOD **S59.2** The provisions of these Regulations, as revised by the World Radiocommunication Conference (Geneva, 1995), concerning new or modified frequency allocations (including any new or modified conditions applying to existing allocations) and the related provisions of Articles **S21** and **S22**, and Appendix **S4**, apply provisionally as of 1 January 1997.

ADD **S59.3** The other provisions of these Regulations, as revised by the World Radiocommunication Conferences (Geneva, 1995 and 1997), shall apply provisionally as of 1 January 1999, with the following exceptions:

ADD **S59.4**

– the revised provisions for which other effective dates of application are stipulated in Resolutions **49 (WRC-97)**, **51 (WRC-97)**, **52 (WRC-97)**, **54 (WRC-97)**, **130 (WRC-97)**, **533 (WRC-97)**, **534 (WRC-97)** and **538 (WRC-97)**.

APPENDICES

MOD

APPENDIX S3

Table of Maximum Permitted Spurious Emission Power Levels

(See Article **S3**)

1. The following sections indicate the maximum permitted levels of spurious emissions, in terms of power as indicated in the tables, of any spurious component supplied by a transmitter to the antenna transmission line. Section 1 is applicable until 1 January 2012 to transmitters installed on or before 1 January 2003; Section 2 is applicable to transmitters installed after 1 January 2003 and to all transmitters after 1 January 2012. This Appendix does not cover out-of-band emissions. Out-of-band emissions are dealt with in No. **S4.5** of the Radio Regulations.

2. Spurious emission from any part of the installation, other than the antenna and its transmission line, shall not have an effect greater than would occur if this antenna system were supplied with the maximum permitted power at that spurious emission frequency.

3. These levels shall not, however, apply to emergency position-indicating radiobeacon (EPIRB) stations, emergency locator transmitters, ships' emergency transmitters, lifeboat transmitters, survival craft stations or maritime transmitters when used in emergency situations.

4. For technical or operational reasons, more stringent levels than those specified may be applied to protect specific services in certain frequency bands. The levels applied to protect these services, such as safety and passive services, shall be those agreed upon by the appropriate world radiocommunication conference. More stringent levels may also be fixed by specific agreement between the administrations concerned. Additionally, special consideration of transmitter spurious emissions may be required for the protection of safety

services, radio astronomy and space services using passive sensors. Information on the levels of interference detrimental to radio astronomy, Earth exploration satellites and meteorological passive sensing is given in the most recent version of Recommendation ITU-R SM.329.

5. Spurious emission limits for combined radiocommunication and information technology equipment are those for the radiocommunication transmitters.

ADD

Section I. Spurious Emission Limits for Transmitters Installed on or Before 1 January 2003 (valid until 1 January 2012)

6. The measurement methods for radar systems should be guided by Recommendation ITU-R M.1177. For those radar systems for which acceptable methods of measurement do not exist, the lowest practicable power of spurious emission should be achieved.

TABLE I

Attenuation values and absolute mean power levels used to calculate maximum permitted spurious emission power levels for use with radio equipment

Frequency band containing the assignment (lower limit exclusive, upper limit inclusive)	For any spurious component, the attenuation (mean power within the necessary bandwidth relative to the mean power of the spurious component concerned) shall be at least that specified below and the absolute mean power levels given shall not be exceeded (Note 1)
9 kHz to 30 MHz	40 decibels 50 milliwatts 2), 3), 4)
30 MHz to 235 MHz	
– mean power above 25 watts	60 decibels 1 milliwatts 5)
– mean power 25 watts or less	40 decibels 25 microwatts
235 MHz to 960 MHz	
– mean power above 25 watts	60 decibels 20 milliwatts 6), 7)
– mean power 25 watts or less	40 decibels 25 microwatts 6), 7)
960 MHz to 17.7 GHz	
– mean power above 10 watts	50 decibels 100 milliwatts 6), 7), 8), 9)
– mean power 10 watts or less	100 microwatts 6), 7), 8), 9)
Above 17.7 GHz	The lowest possible values achievable shall be employed (see Recommendation **66 (Rev.WRC-97)**).

Notes to Table I

[1] When checking compliance with the provisions of the table, it shall be verified that the bandwidth of the measuring equipment is sufficiently wide to accept all significant components of the spurious emission concerned.

[2] For mobile transmitters which operate below 30 MHz, any spurious component shall have an attenuation of at least 40 decibels without exceeding the value of 200 milliwatts, but every effort should be made to comply with the level of 50 milliwatts wherever practicable.

[3] For transmitters of a mean power exceeding 50 kilowatts which can operate on two or more frequencies covering a frequency range approaching an octave or more, while a reduction below 50 milliwatts is not mandatory, a minimum attenuation of 60 decibels shall be provided.

[4] For hand-portable equipment of mean power less than 5 watts, the attenuation shall be 30 decibels, but every practicable effort should be made to attain 40 decibels attenuation.

[5] Administrations may adopt a level of 10 milliwatts provided that harmful interference is not caused.

[6] Where several transmitters feed a common antenna or closely spaced antennas on neighbouring frequencies, every practicable effort should be made to comply with the levels specified.

[7] Since these levels may not provide adequate protection for receiving stations in the radio astronomy and space services, more stringent levels might be considered in each individual case in the light of the geographical position of the stations concerned.

[8] These levels are not applicable to systems using digital modulation techniques, but may be used as a guide. Values for these systems may be provided by the relevant ITU-R Recommendations, when available (see Recommendation **66 (Rev.WRC 97)**).

[9] These levels are not applicable to stations in the space services, but the levels of their spurious emissions should be reduced to the lowest possible values compatible with the technical and economic constraints to which the equipment is subject. Values for these systems may be provided by the relevant ITU-R Recommendations, when available (see Recommendation **66 Rev.WRC-97)**).

ADD

Section II. Spurious Emission Limits for Transmitters Installed After 1 January 2003 and for All Transmitters After 1 January 2012

Application of these limits

7. The frequency range of the measurement of spurious emissions is from 9 kHz to 110 GHz or the second harmonic if higher.

8. Guidance regarding the methods of measuring spurious emissions is given in the most recent version of Recommendation ITU-R SM.329. The e.i.r.p. method specified in that Recommendation should be used when it is not possible to measure the power supplied to the antenna transmission line. Additionally, the e.i.r.p. method may need some modification for special cases, e.g. beam-forming radars.

9. Guidance regarding the methods of measuring spurious emissions from radar systems is given in the most recent version of Recommendation ITU-R M.1177. The reference bandwidths required for proper measurement of radar spurious emissions should be calculated for each particular radar system. Thus, for the three general types of radar pulse modulation utilized for radio-navigation, radiolocation, acquisition, tracking and other radiodetermination functions, the reference bandwidth values should be:

– for fixed-frequency, non-pulse-coded radar, one divided by the radar pulse length, in seconds (e.g. if the radar pulse length is 1 microsecond, then the reference bandwidth is 1/1μs = 1 MHz);

– for fixed-frequency, phase coded pulsed radar, one divided by the phase chip length, in seconds (e.g. if the phase coded chip is 2 microseconds long, then the reference bandwidth is 1/2μs = 500 kHz);

– for frequency modulated (FM) or chirped radar, the square root of the quantity obtained by dividing the radar bandwidth in MHz by

the pulse length, in seconds (e.g. if the FM is from 1 250 to 1 280 MHz or 30 MHz during the pulse of 10 microseconds, then the reference bandwidth is $(30\ \text{MHz}/10\mu\text{s})^{1/2} = 1.73$ MHz).

For those radar systems for which acceptable methods of measurement do not exist, the lowest practicable power of spurious emission should be achieved.

10. The spurious emission levels are specified in the following reference bandwidths:

– 1 kHz between 9 kHz and 150 kHz

– 10 kHz between 150 kHz and 30 MHz

– 100 kHz between 30 MHz and 1 GHz

– 1 MHz above 1 GHz

As a special case, the reference bandwidth of all space service spurious emissions should be 4 kHz.

11. For the purpose of setting limits, all emissions, including harmonic emissions, intermodulation products, frequency conversion products and parasitic emissions, which fall at frequencies separated from the centre frequency of the emission by ±250%, or more, of the necessary bandwidth of the emission will generally be considered as spurious emissions. However, this frequency separation may be dependent on the type of modulation used, the maximum bit rate in the case of digital modulation, the type of transmitter and frequency coordination factors. For example, in the case of digital (including digital broadcasting) modulation systems, broadband systems, pulsed modulation systems and narrow-band high power transmitters, the frequency separation may need to differ from the ±250% factor. For multichannel or multicarrier transmitters/transponders, where several carriers may be transmitted simultaneously from a final output amplifier or an active antenna, the centre frequency of the emission is taken to be the centre of the –3 dB bandwidth of the transmitter or transponder and the necessary bandwidth is taken to be the transmitter or transponder bandwidth.

12. Examples of applying 43 + 10 log (*P*) to calculate attenuation requirements

Where specified in relation to mean power, spurious emissions are to be at least x dB below the total mean power *P*, i.e. –x dBc. The power *P* (in watts) is to be measured in a bandwidth wide enough to include the total mean power. The spurious emissions are to be measured in the reference bandwidths given in the Recommendation. The measurement of the spurious emission power is independent of the value of necessary bandwidth. Because the absolute emission power limit, derived from 43 + 10 log (*P*), can become too stringent for high-power transmitters, alternative relative powers are also provided in Table II.

Example 1

A land mobile transmitter, with any value of necessary bandwidth, must meet a spurious emission attenuation of 43 + 10 log (*P*), or 70 dBc, whichever is less stringent. To measure spurious emissions in the frequency range between 30 MHz and 1 000 MHz, Recommendation ITU-R SM.329-7 *recommends* 4.1 indicates the use of a reference bandwidth of 100 kHz. For other frequency ranges, the measurement must use the appropriate reference bandwidths given in *recommends* 4.1.

With a measured total mean power of 10 watts:

- Attenuation relative to total mean power = 43 + 10 log (10) = 53 dBc.
- The 53 dBc is less stringent than 70 dBc, so the 53 dBc value is used.
- Therefore: Spurious emissions must not exceed 53 dBc in a 100 kHz bandwidth, or converting to an absolute level, spurious emissions must not exceed 10 dBW – 53 dBc = –43 dBW in a 100 kHz reference bandwidth.

With a measured total mean power of 1 000 watts:

– Attenuation relative to total mean power = 43 + 10 log (1 000) = 73 dBc.

– The 73 dBc is more stringent than 70 dBc limit, so the 70 dBc value is used.

– Therefore: Spurious emissions must not exceed 70 dBc in a 100 kHz bandwidth, or converting to an absolute level, spurious emissions must not exceed 30 dBW – 70 dBc = –40 dBW in a 100 kHz reference bandwidth.

Example 2

A space service transmitter with any value of necessary bandwidth must meet a spurious emission attenuation of 43 + 10 log (*P*), or 60 dBc, whichever is less stringent. To measure spurious emissions at any frequency, Note 1 to Table II indicates using a reference bandwidth of 4 kHz.

With a measured total mean power of 20 watts:

– Attenuation relative to total mean power = 43 + 10 log (20) = 56 dBc.

– The 56 dBc is less stringent than the 60 dBc limit, so the 56 dBc value is used.

– Therefore: Spurious emissions must not exceed 56 dBc in a 4 kHz reference bandwidth, or converting to an absolute level, spurious emissions must not exceed 13 dBW – 56 dBc = –43 dBW in a 4 kHz reference bandwidth.

TABLE II

Attenuation values used to calculate maximum permitted spurious emission power levels for use with radio equipment

Service category in accordance with Article **S1**, or equipment type[15)]	Attenuation (dB) below the power supplied to the antenna transmission line
All services except those services quoted below:	43 + 10 log (*P*), or 70 dBc, whichever is less stringent
Space services (earth stations) [10), 14)]	43 + 10 log (*P*), or 60 dBc, whichever is less stringent
Space services (space stations) [10), 14)]	43 + 10 log (*P*), or 60 dBc, whichever is less stringent
Radiodetermination	43 + 10 log (*PEP*), or 60 dB, whichever is less stringent
Broadcast television[11)]	46 + 10 log (*P*), or 60 dBc, whichever is less stringent, without exceeding the absolute mean power level of 1 mW for VHF stations or 12 mW for UHF stations. However, greater attenuation may be necessary on a case by case basis.
Broadcast FM	46 + 10 log (*P*), or 70 dBc, whichever is less stringent; the absolute mean power level of 1 mW should not be exceeded
Broadcasting at MF/HF	50 dBc; the absolute mean power level of 50 mW should not be exceeded
SSB from mobile stations[12)]	43 dB below *PEP*
Amateur services operating below 30 MHz (including with SSB)[12)]	43 + 10 log (*PEP*), or 50 dB, whichever is less stringent

TABLE II (*end*)

Service category in accordance with Article **S1**, or equipment type[15)]	Attenuation (dB) below the power supplied to the antenna transmission line
Services operating below 30 MHz, except space, radiodetermination, broadcast, those using SSB from mobile stations, and amateur[12)]	43 + 10 log (*X*), or 60 dBc, whichever is less stringent, where *X* = *PEP* for SSB modulation, and *X* = *P* for other modulation
Low-power device radio equipment[13)]	56 + 10 log (*P*), or 40 dBc, whichever is less stringent
Emergency position-indicating radio beacon Emergency locator transmitter Personal location beacon Search and rescue transponder Ship emergency, lifeboat and survival craft transmitters Land, aeronautical or maritime transmitters when used in emergency	No limit

P: mean power in watts supplied to the antenna transmission line, in accordance with No. **S1.158**. When burst transmission is used, the mean power *P* and the mean power of any spurious emissions are measured using power averaging over the burst duration.

PEP: peak envelope power in watts supplied to the antenna transmission line, in accordance with No. **S1.157**.

dBc: decibels relative to the unmodulated carrier power of the emission. In the cases which do not have a carrier, for example in some digital modulation schemes where the carrier is not accessible for measurement, the reference level equivalent to dBc is decibels relative to the mean power *P*.

Notes to Table II

[10] Spurious emission limits for all space services are stated in a 4 kHz reference bandwidth.

[11] For analogue television transmissions, the mean power level is defined with a specified video signal modulation. This video signal has to be chosen in such a way that the maximum mean power level (e.g. at the video signal blanking level for negatively modulated television systems) is supplied to the antenna transmission line.

[12] All classes of emission using SSB are included in the category "SSB".

[13] Low-power radio devices having a maximum output power of less than 100 mW and intended for short-range communication or control purposes; such equipment is in general exempt from individual licensing.

[14] These values are "design objectives". This note will not be applicable after the 1999 World Radiocommunication Conference.

[15] In some cases of digital modulation (including digital broadcasting), broadband systems, pulsed modulation and narrow-band high-power transmitters for all categories of services, there may be difficulties in meeting limits close to ±250% of the necessary bandwidth.

APPENDIX S4

Consolidated List and Tables of Characteristics for Use in the Application of the Procedures of Chapter SIII

NOC 1. and 2.

ANNEX 1A

List of characteristics of stations in the terrestrial services[1]

NOC *ITEM B* to *ITEM 6B*

SUP *ITEM 6C*

NOC *ITEM 7A*

ADD *ITEM 7AA – Type of modulation*

The choice of modulation is needed in order to specify if the requirement is to use DSB, SSB or any new broadcasting techniques recommended by ITU-R.

NOC *ITEM 7B* to *ITEM 8AB*

MOD *ITEM 8B – Radiated power (dBW)*

The radiated power expressed in dBW in one of the forms described in Nos. **S1.161** to **S1.163**. In the case of systems where automatic power control is applied, indicate the range of power control, expressed in dB relative to the transmitted power indicated above.

NOC *ITEM 8BH* to *ITEM 9E*

---

[1] The Bureau shall develop and keep up to date forms of notice to meet fully the statutory provisions of this Appendix and related decisions of future conferences. Additional information on the items listed in this Annex together with an explanation of the symbols is to be found in the Preface to the International Frequency List.

MOD *ITEM 9EA – Altitude of site above sea level*

Information on the altitude of the site above mean sea level, in metres (for VHF sound broadcasting (BC) and VHF/UHF television broadcasting (BT) assignments, and for all terrestrial stations in the frequency bands above 1 GHz that are shared between space radiocommunication and terrestrial radiocommunication services).

NOC *ITEM 9EB* to *ITEM 9Q*

ADD *ITEM 9R – Slew angle*

The slew angle represents the difference between the azimuth of maximum radiation and the direction of unslewed radiation.

NOC *ITEM 9T1* to *ITEM 10B*

SUP *ITEM 10C*

ADD *ITEM 10CA – Start date*

Used in the case that the requirement starts after the start of the schedule.

ADD *ITEM 10CB – Stop date*

Used in the case that the requirement stops before the end of the schedule.

ADD *ITEM 10CC – Days of operation*

Used when the station does not transmit every day of the week.

NOC *ITEM 10D* to *ITEM 12B*

ANNEX 1B

Table of characteristics to be submitted for stations in the terrestrial services

Notice type	AP1/A1					AP1/B		AP1/C	AP1/A2	AP1/A4		AP1/A5	AP1/A6	AP1/A7	AP2	AP5	AP1/A1	Notice type
Item No.	AL, NL LR, OE	FC, FP FA, BC FB	FD, FG	FX	SM	AM, ML MA, MO	MS, OD SA	All, except BC	BC	BC	BT	BC	BT	BC	BC	FC	FC (Art. **S11**)	Item No.
B	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	B
SYNC									X					X				SYNC
1A	X	X	X	X	X	X	X	X	X	X	X[5)]	X	X[5)]	X	X		X	1A
1B	+	+	+	+	+	+	+	+			X[5)]				+			1B
1C				+											X	+		1C
1D											X		X					1D
1E											X		X					1E
1G															O			1G
1H															X			1H
1X																X		1X
1Y																O		1Y
1Z																+		1Z
2C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	+	X	X	2C
3A	X	X	X	X	X				X	O	O	O	O		X		X	3A
4A	X	X	X	X	X				X	X	X	X	X	X	X	+	X	4A
4B	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	4B
4C	X	X	X	X	X	*1)	*1)	*1)	X	X	X	X	X	X	X	+	X	4C
4D						*1)	*1)	*1)										4D
4E						*	*	*										4E
4F																	X	4F
4G									X									4G
5A				X		X	X											5A
5B				X		X	X											5B
5C				X		X	X										*	5C
5D		*2)	*2)												X	*3)	*	5D
5E	X	*	*		X											*		5E

X Mandatory * One of the items + Required in specific cases O Optional

1) (4C and 4D) or (4E).

2) (5D) or (5E and 5F).

3) (5D and 5F) or (5E and 5F).

5) May not be required with the new TerRaSys.

Table of characteristics to be submitted for stations in the terrestrial services *(cont.)*

Notice type	AP1/A1					AP1/B		AP1/C	AP1/A2	AP1/A4		AP1/A5	AP1/A6	AP1/A7	AP2	AP5	AP1/A1	Notice type
Item No.	AL, NL LR, OE	FC, FP FA, BC FB	FD, FG	FX	SM	AM, ML MA, MO	MS, OD SA	All, except BC	BC	BC	BT	BC	BT	BC	BC	FC	FC (Art. **S11**)	Item No.
5F	X	*	*		X											*		5F
5G	+	+	+	+	+											+	+	5G
6A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6A
6B	+	+	X	X		X	X	+								X		6B
7A	X	X	X	X	X	X	X	X	X	X[5)]	X[5)]	X[5)]	X[5)]	X	X	X	X	7A
7AA															X			7AA
7B				X					X					X				7B
7C1									X[4)]		X		X					7C1
7C2											X		X					7C2
7D												X						7D
7E				+[7)]														7E
7F				+[7)]														7F
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	8
8A	*	*	X	*	X	*	*	*	X					X	X	X	*	8A
8AB				+[7)]														8AB
8B	*	*		*		*	*	*		X	X	X	X				*	8B
8BH										X	X	X	X					8BH
8BV										X	X	X	X					8BV
8D											X		X					8D
9	X	X	X	X	X				X	X	X	X	X		X	X	X	9
9A	X	X	X	X	X				X	X	X	X	X		X	X	X	9A
9AA														X				9AA
9AB	+	+	+	+	+				+						+	+	+	9AB
9B				+											X			9B
9C	+	+	+	+	+											+		9C
9CA														X				9CA
9D				+						X	X	X	X					9D
9E	+	+	+	+	+				X	X	X	X	X					9E
9EA	+	+	+	+	+					X	X	X	X					9EA
9EB										X	X	X	X					9EB
9EC										X	X	X	X					9EC

X Mandatory * One of the items + Required in specific cases O Optional

4) For low-power channels.

5) May not be required with the new TerRaSys.

7) This information need only be furnished when such information has been used as a basis to effect coordination with another administration. This information may be optionally provided in a request for coordination under Nos. **S9.16**, **S9.18** and **S9.19**.

Table of characteristics to be submitted for stations in the terrestrial services *(cont.)*

Notice type	AP1/A1					AP1/B		AP1/C	AP1/A2	AP1/A4		AP1/A5	AP1/A6	AP1/A7	AP2	AP5	AP1/A1	Notice type
Item No.	AL, NL LR, OE	FC, FP FA, BC FB	FD, FG	FX	SM	AM, ML MA, MO	MS, OD SA	All, except BC	BC	BC	BT	BC	BT	BC	BC	FC	FC (Art. **S11**)	Item No.
9F														X				9F
9G	+	+	+	+	+			+							+	+		9G
9GH									X									9GH
9GV									X									9GV
9H									X	X[5)]	X[5)]	X[5)]		+		+		9H
9I									X					X				9I
9IA														X				9IA
9J				+, +[7)]											X	+		9J
9K				+[7)]														9K
9N												X[5)]						9N
9NA														X				9NA
9NH										X[6)]	X[6)]	X[6)]	X					9NH
9NV										X[6)]	X[6)]	X[6)]	X					9NV
9O														X	X	X		9O
9P														X				9P
9Q									X					X				9Q
9R															X			9R
9T1														X				9T1
9T2														X				9T2
9T3														X				9T3
9T4														X				9T4
9T5														X				9T5
9T6														X				9T6
9T7														X				9T7
9T8														X				9T8
9T9A														+				9T9A
9T9B														X				9T9B
9T9C														+				9T9C

X Mandatory * One of the items + Required in specific cases O Optional

5) May not be required with the new TerRaSys.

6) To be used in the future TerRaSys.

7) This information need only be furnished when such information has been used as a basis to effect coordination with another administration. This information may be optionally provided in a request for coordination under Nos. **S9.16**, **S9.18** and **S9.19**.

Table of characteristics to be submitted for stations in the terrestrial services *(end)*

Notice type	AP1/A1					AP1/B		AP1/C	AP1/A2	AP1/A4		AP1/A5	AP1/A6	AP1/A7	AP2	AP5	AP1/A1	Notice type
Item No.	AL, NL LR, OE	FC, FP FA, BC FB	FD, FG	FX	SM	AM, ML MA, MO	MS, OD SA	All, except BC	BC	BC	BT	BC	BT	BC	BC	FC	FC (Art. **S11**)	Item No.
9T9D														+				9T9D
10A				+														10A
10B	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	10B
10CA															O			10CA
10CB															O			10CB
10CC															O			10CC
10D																X		10D
10E																X		10E
10F																	X	10F
11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	O	O	X	11
12A	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	12A
12B	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	12B

X Mandatory * One of the items + Required in specific cases O Optional

ANNEX 2A

Characteristics of Satellite Networks or Earth Stations or Radio Astronomy Stations[1]

NOC A. to A.12

ADD A.13 *As appropriate, reference to the Special Section of the Bureau's Weekly Circular*

a) providing the advance publication information required in accordance with No. **S9.1**;

b) providing the coordination information required in accordance with No. **S9.7**;

c) providing the information required in accordance with No. **S9.21**;

d) providing the coordination information required in accordance with No. **S9.8**;

e) providing the coordination information required in accordance with No. **S9.9**;

f) providing the coordination information required in accordance with No. **S9.11**;

g) providing the coordination information required in accordance with No. **S9.11A**;

h) providing the information required in accordance with Article 6 of Appendix **S30B**.

NOC B. to B.3

MOD B.4 *Non-geostationary space station antenna characteristics*

a) Isotropic gain of the antenna in the direction of maximum radiation (dBi) and the antenna radiation pattern.

b) In the case of a space station submitted in accordance with Resolution **46 (Rev.WRC-97)/** No. **S9.11A**:

– orientation of the satellite transmitting and receiving antenna beams and their radiation pattern;

- satellite antenna gain $G(\theta_e)$ as a function of elevation angle at a fixed point on the Earth;
- spreading loss (for a non-geostationary satellite) as a function of elevation angle (to be determined by equations or provided in graphical format);
- maximum and average beam peak e.i.r.p./4 kHz and e.i.r.p./1 MHz for each beam;
- for the fixed-satellite service (space-to-Earth) in the band 6 700-7 075 MHz, calculated peak value of power flux-density produced within ±5° inclination of the geostationary-satellite orbit.

NOC B.5 to D.2

ANNEX 2B

Table of characteristics to be submitted for space and radio astronomy services
A. General characteristics of the satellite network or the earth station

Items in Appendix	Advance publication of a geostationary-satellite network	Advance publication of a non-geostationary-satellite network subject to coordination under Section II of Article **S9**	Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article **S9**	Notification or coordination of a geostationary-satellite network (including Appendix **S30B**)	Notification or coordination of a non-geostationary-satellite network	Notification or coordination of an earth station	Notice for space stations in the broadcasting-satellite service under Appendix **S30** *	Notice for feeder-link stations under Appendix **S30A** *	Notice for stations in the fixed-satellite service under Appendix **S30B**	Items in Appendix	Radio astronomy
A.1.a	X	X	X	X	X		X	X	X	A.1.a	
A.1.b							X			A.1.b	
A.1.c								X		A.1.c	
A.1.d									X	A.1.d	
A.1.e.1						X				A.1.e.1	
A.1.e.2						X				A.1.e.2	X
A.1.e.3						X				A.1.e.3	
A.1.e.4										A.1.e.4	X
A.1.f	X	X	X	X	X	X	X	X	X	A.1.f	X
A.2.a	X	X	X	X	X	X	X	X	X	A.2.a	
A.2.b	X			X						A.2.b	
A.2.c										A.2.c	X
A.3			X	X	X	X	X	X		A.3	X
A.4.a.1	X			X			X	X	X	A.4.a.1	
A.4.a.2				X			X	X		A.4.a.2	
A.4.a.3				X						A.4.a.3	
A.4.a.4				X						A.4.a.4	
A.4.a.5				X						A.4.a.5	
A.4.b.1		X	X		X					A.4.b.1	
A.4.b.2		X	X		X					A.4.b.2	
A.4.b.3		X	X		X					A.4.b.3	
A.4.b.4		X	X		X					A.4.b.4	
A.4.b.5					X					A.4.b.5	
A.4.c						X				A.4.c	
A.5				X	X	X	X	X	X	A.5	

X Mandatory information O Optional information C This information need only be furnished when it has been used as a basis to effect coordination with another administration

* The application of this column is suspended pending the decision of the 1999 World Radiocommunication Conference.

A. General characteristics of the satellite network or the earth station *(end)*

Items in Appendix	Advance publication of a geostationary-satellite network	Advance publication of a non-geostationary-satellite network subject to coordination under Section II of Article **S9**	Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article **S9**	Notification or coordination of a geostationary-satellite network (including Appendix **S30B**)	Notification or coordination of a non-geostationary-satellite network	Notification or coordination of an earth station	Notice for space stations in the broadcasting-satellite service under Appendix **S30** *	Notice for feeder-link stations under Appendix **S30A** *	Notice for stations in the fixed-satellite service under Appendix **S30B**	Items in Appendix	Radio astronomy
A.6				X	X	X	X	X	X	A.6	
A.7.a						X		X		A.7.a	
A.7.b						X		X		A.7.b	
A.7.c						X				A.7.c	
A.7.d						X		X		A.7.d	
A.8							X			A.8	
A.9							X			A.9	
A.10						X				A.10	
A.11							X	X		A.11	
A.12								X		A.12	
A.13				X	X	X				A.13	

B. Characteristics to be provided for each satellite antenna beam and for each earth station antenna

Items in Appendix	Advance publication of a geostationary-satellite network	Advance publication of a non-geostationary- satellite network subject to coordination under Section II of Article **S9**	Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article **S9**	Notification or coordination of a geostationary-satellite network (including Appendix **S30B**)	Notification or coordination of a non-geostationary-satellite network	Notification or coordination of an earth station	Notice for space stations in the broadcasting-satellite service under Appendix **S30** *	Notice for feeder-link stations under Appendix **S30A** *	Notice for stations in the fixed-satellite service under Appendix **S30B**	Items in Appendix	Radio astronomy
B.1			X	X	X	X	X	X	X	B.1	
B.2			X	X	X	X			X	B.2	
B.3.a				X						B.3.a	
B.3.b.1				X						B.3.b.1	
B.3.b.2				X						B.3.b.2	
B.3.c				C						B.3.c	
B.3.d				X			X	X	X	B.3.d	
B.3.e				X						B.3.e	
B.3.f				X				X		B.3.f	
B.3.g.1							X	X	X	B.3.g.1	
B.3.g.2							X	X	X	B.3.g.2	
B.3.g.3							X	X	X[9)]	B.3.g.3	
B.3.g.4							X	X	X[9)]	B.3.g.4	
B.3.g.5							X	X	X[9)]	B.3.g.5	
B.3.g.6								X		B.3.g.6	
B.3.g.7							X			B.3.g.7	
B.4.a			X		X					B.4.a	
B.4.b			X		X					B.4.b	
B.5.a						X				B.5.a	
B.5.b						X				B.5.b	
B.5.c						X				B.5.c	
B.6										B.6	X

X Mandatory information O Optional information C This information need only be furnished when it has been used as a basis to effect coordination with another administration

9) Only information on co-polar antenna characteristics is required.

* The application of this column is suspended pending the decision of the 1999 World Radiocommunication Conference.

C. Characteristics to be provided for each group of frequency assignments for a satellite antenna beam or an earth station antenna

Items in Appendix	Advance publication of a geostationary-satellite network	Advance publication of a non-geostationary- satellite network subject to coordination under Section II of Article **S9**	Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article **S9**	Notification or coordination of a geostationary-satellite network (including Appendix **S30B**)	Notification or coordination of a non-geostationary-satellite network	Notification or coordination of an earth station	Notice for space stations in the broadcasting-satellite service under Appendix **S30** *	Notice for feeder-link stations under Appendix **S30A** *	Notice for stations in the fixed-satellite service under Appendix **S30B**	Items in Appendix	Radio astronomy
C.1	X	X	X						X	C.1	
C.2.a				X	X	X	X	X		C.2.a	
C.2.b										C.2.b	X
C.3.a				X	X	X		X		C.3.a	
C.3.b										C.3.b	X
C.4	X	X	X	X	X	X	X	X		C.4	X
C.5.a			X	X	X			X	X	C.5.a	
C.5.b						X				C.5.b	
C.5.c										C.5.c	X
C.6			X	X	X	X	X	X		C.6	
C.7.a			O	X	X	X	X	X		C.7.a	
C.7.b			O	C	C	C				C.7.b	
C.7.c			O	C	C	C				C.7.c	
C.7.d			O	C	C	C				C.7.d	
C.8.a			X[1), 7)]	X[7)]	X[7)]	C[8)]				C.8.a	
C.8.b			X[1), 7)]	X[7)]	X[7)]	X				C.8.b	
C.8.c			O	X[6)]	X[6)]	X[6)]				C.8.c	
C.8.d				X[2)]	X[2)]					C.8.d	
C.8.e			O	X[6)]	X[6)]	X[6)]				C.8.e	
C.8.f			X[3)]							C.8.f	
C.8.g				C[4)]	C[4)]	C[4), 5)]				C.8.g	
C.8.h							X			C.8.h	
C.8.i								X		C.8.i	
C.8.j									X	C.8.j	

X Mandatory information O Optional information C This information need only be furnished when it has been used as a basis to effect coordination with another administration

1) Only the value of maximum power density is mandatory.

2) For transmission from the space station only.

3) For space-to-space relay only.

4) For transmission from the earth station only.

5) Not required for coordination under Nos. **S9.15**, **S9.17** or **S9.17A**.

6) Required, if applicable, for the type of transmission. If not applicable, a reason why it is not applicable is required.

7) One or the other of C.8.a or C.8.b is mandatory, but not both.

8) Only the value of total peak envelope power is required for coordination under Nos. **S9.15, S9.17** or **S9.17A**.

* The application of this column is suspended pending the decision of the 1999 World Radiocommunication Conference.

C. Characteristics to be provided for each group of frequency assignments for a satellite antenna beam or an earth station antenna *(end)*

Items in Appendix	Advance publication of a geostationary-satellite network	Advance publication of a non-geostationary-satellite network subject to coordination under Section II of Article **S9**	Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article **S9**	Notification or coordination of a geostationary-satellite network (including Appendix **S30B**)	Notification or coordination of a non-geostationary-satellite network	Notification or coordination of an earth station	Notice for space stations in the broadcasting-satellite service under Appendix **S30** *	Notice for feeder-link stations under Appendix **S30A** *	Notice for stations in the fixed-satellite service under Appendix **S30B**	Items in Appendix	Radio astronomy
C.9.a			O	C	C					C.9.a	
C.9.b							X	X		C.9.b	
C.9.c			X		X					C.9.c	
C.10.a			X	X	X					C.10.a	
C.10.b			X	X	X			X		C.10.b	
C.10.c.1			X	X	X			X	X	C.10.c.1	
C.10.c.2			X	X	X			X	X	C.10.c.2	
C.10.c.3			O	X	X			X	X	C.10.c.3	
C.10.c.4			X	X	X			X	X	C.10.c.4	
C.10.c.5			X	X	X				X	C.10.c.5	
C.10.c.6								X		C.10.c.6	
C.11.a	X[10)]	X[10)]	X	X	X					C.11.a	
C.11.b								X		C.11.b	
C.11.c							X		X	C.11.c	
C.11.d					X					C.11.d	
C.12									X	C.12	
C.13										C.13	X
C.14							X			C.14	

X Mandatory information O Optional information C This information need only be furnished when it has been used as a basis to effect coordination with another administration

10) Only the list of country or geographic designators or a narrative description of the service area shall be supplied.

D. Overall Link Characteristics

Items in Appendix	Advance publication of a geostationary-satellite network	Advance publication of a non-geostationary-satellite network subject to coordination under Section II of Article **S9**	Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article **S9**	Notification or coordination of a geostationary-satellite network (including Appendix **S30B**)	Notification or coordination of a non-geostationary-satellite network	Notification or coordination of an earth station	Notice for space stations in the broadcasting-satellite service under Appendix **S30** *	Notice for feeder-link stations under Appendix **S30A** *	Notice for stations in the fixed-satellite service under Appendix **S30B**	Items in Appendix	Radio astronomy
D.1				X						D.1	
D.2.a				X						D.2.a	
D.2.b				X						D.2.b.	

X Mandatory information O Optional information C This information need only be furnished when it has been used as a basis to effect coordination with another administration

* The application of this column is suspended pending the decision of the 1999 World Radiocommunication Conference.

APPENDIX S5

Identification of Administrations with Which Coordination Is to Be Effected or Agreement Sought Under the Provisions of Article S9

NOC 1. *a)* to *d)*

MOD *e)* included in the coordination procedure with effect from the date of receipt[3] by the Bureau, in accordance with No. **S9.34**, of those characteristics specified in Appendix **S4** as mandatory or required, or from the date of dispatch, in accordance with No. **S9.29**, of the appropriate information listed in Appendix **S4**; or

ADD *f)* where appropriate, in conformity with a world or regional allotment or assignment plan and the associated provisions;

MOD *g)* for terrestrial radiocommunication stations or earth stations operating in the opposite direction of transmission[4] and, in addition, operating in accordance with these Regulations, or to be so operated prior to the date of bringing the earth station assignment into service, or within the next three years from the date of dispatch of coordination data under No. **S9.29**, whichever is the longer, or from the date of the publication referred to in No. **S9.38**, as appropriate.

MOD 2. For the application of No. **S9.21**, the agreement of an administration may be required with respect to the frequency assignments in the same frequency band as the planned assignment, pertaining to the same service or to another service to which the band is allocated with equal rights or a higher category of allocation, which may affect or be affected, as appropriate, and:

a) in cases involving a station in a space radiocommunication service with respect to any other station or involving a terrestrial radiocommunication station with respect to an earth station:

i) which are in conformity with No. **S11.31**, and comply with the relevant conditions listed in § 1. *b)* to 1. *g)*; or

ii) for which the procedure under No. **S9.21** has been initiated, with effect from the date of receipt by the Bureau, in accordance with No. **S9.34**, of the basic characteristics specified in Appendix **S4**;

or

b) for terrestrial radiocommunication stations operating in accordance with these Regulations, or to be so operated prior to the date of bringing the other terrestrial station assignment into service, or within the next three months, whichever is the longer;

MOD 3. For each of the frequency assignments to a station of a terrestrial or space radiocommunication service referred to in § 1. and 2. above, the level of interference shall be determined using the method referred to in Table S5-1 which is appropriate to the particular case.

MOD 4. The assignment is considered to affect or be affected, as appropriate, and coordination must be sought under the procedure of Article **S9**, if:

a) the threshold levels given in Table S5-1 are exceeded; and

b) the condition specified in Table S5-1 is applicable.

NOC 5.

MOD 6. No coordination is required:

a) when the use of a new frequency assignment will not cause or suffer, as appropriate, in respect of any service of another administration, an increase in the level of interference above the threshold calculated in accordance with the method referred to in Tables S5-1 and S5-2; or

NOC *b)* to *g)*

MOD

TABLE S5-1

Technical conditions for coordination
(see Article **S9**)

Reference of Article **S9**	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
MOD No. **S9.7** GSO/GSO	A station in a satellite network using the geostationary-satellite orbit (GSO), in any space radiocommunication service, in a frequency band and in a Region where this service is not subject to a Plan, in respect of any other satellite network using that orbit, in any space radiocommunication service in a frequency band and in a Region where this service is not subject to a Plan, with the exception of the coordination between earth stations operating in the opposite direction of transmission	Any frequency band allocated to a space service, where this service is not subject to a Plan	Value of $\Delta T/T$ exceeds 6%	Appendix **S8**	

TABLE S5-1 (*continued*)

	Reference of Article **S9**	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
MOD	No. **S9.8** GSO/GSO	A transmitting space station in the fixed-satellite service (FSS) using the geostationary-satellite orbit in a frequency band shared with the broadcasting-satellite service (BSS) on an equal primary basis, in respect of space stations in the latter service which are subject to the Plans in Appendix **S30**	11.7-12.2 GHz (Region 2) 12.2-12.7 GHz (Region 3) 12.5-12.7 GHz (Region 1)	i) There is an overlap in the necessary bandwidths of the FSS and BSS space stations; and ii) the power flux-density of the FSS space station exceeds the value given in Annex 4 of Appendix **S30** on the territory of another administration located in another Region	Check by using the assigned frequencies and bandwidths;	See also Article 7 of Appendix **S30**. Application of this provision with respect to Articles 6 and 7 of Appendices **S30** and **S30A** is suspended pending the decision of the 1999 World Radiocommunication Conference on the revision of these two Appendices.

TABLE S5-1 (*continued*)

	Reference of Article **S9**	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
MOD	No. **S9.9** GSO/GSO	A station of the FSS in a frequency band shared on an equal primary basis with the feeder links of the BSS, which are subject to the Plans in Appendix **S30A**	17.7-18.1 GHz (Region 1) 17.7-18.1 GHz (Region 3) 17.7-17.8 GHz (Region 2)	i) Value of $\Delta T_S/T_S$ exceeds 4% (see Section I of Annex 4 of Appendix **S30A**); and ii) geocentric inter-satellite angular separation is less than 3° or greater than 150°	i) Case II of Appendix **S8** ii) Annex 1 of Appendix **S8**	The threshold/ conditions do not apply when the geo-centric angular separation, between an FSS transmitting space station and a receiving space station in the feeder-link plan, exceeds 150° of arc and the free-space power flux-density of the FSS transmitting space station does not exceed a value of –137 dB (W/m^2/MHz) on the surface of the Earth at the equatorial limb. Application of this provision with respect to Articles 6 and 7 of Appendices **S30** and **S30A** is suspended pending the decision of the 1999 World Radio-communication Conference on the revision of these two Appendices.

TABLE S5-1 (*continued*)

	Reference of Article **S9**	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
MOD	No. **S9.11** GSO/ terrestrial	A space station in the BSS in any band shared on an equal primary basis with terrestrial services and where the BSS is not subject to a Plan, in respect of terrestrial services	620-790 MHz 1 452-1 492 MHz 2 310-2 360 MHz 2 520-2 655 MHz 2 655-2 670 MHz 12.5-12.75 GHz (Region 3) 17.7-17.8 GHz (Region 2) 21.4-22 GHz (Region 1, Region 3) 40.5-42.5 GHz 84-86 GHz	Condition: bandwidths overlap	Check by using the assigned frequencies and bandwidths	
MOD	No. **S9.12** 1) Non-GSO/ non-GSO	A station in a satellite network using a non-geo-stationary-satellite orbit in the frequency bands for which a footnote refers to No. **S9.11A** in respect of any other satellite network using a non-geostationary-satellite orbit, with the exception of coordination between earth stations operating in the opposite direction of transmission	See Table S5-2	Condition: bandwidths overlap	Check by using the assigned frequencies and bandwidths	

TABLE S5-1 (*continued*)

	Reference of Article **S9**	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
MOD	No. **S9.12** 2) Non-GSO/GSO	A station in a satellite network using a non-geostationary-satellite orbit in the frequency bands for which a footnote refers to No. **S9.11A** in respect of any other satellite network using the geostationary-satellite orbit, with the exception of coordination between earth stations operating in the opposite direction of transmission	See Table S5-2	Condition: bandwidths overlap	Check by using the assigned frequencies and bandwidths	
MOD	No. S9.13 GSO/non-GSO	A station in a satellite network using the geostationary-satellite orbit in the frequency bands for which a footnote refers to No. **S9.11A** in respect of any other satellite network using a non-geostationary-satellite orbit, with the exception of coordination between earth stations operating in the opposite direction of transmission	See Table S5-2	Condition: bandwidths overlap	Check by using the assigned frequencies and bandwidths	

TABLE S5-1 (*continued*)

	Reference of Article **S9**	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
MOD	No. **S9.14** Non-GSO/ terrestrial, GSO/ terrestrial	For a space station in a satellite network in the frequency bands for which a footnote refers to No. **S9.11A** in respect of stations of terrestrial services where threshold(s) is (are) exceeded	See Table S5-2	See § 1 of Annex 1 of this Appendix	See § 1 of Annex 1 of this Appendix	
(MOD)	No. **S9.15** Non-GSO/ terrestrial	A specific earth station or a typical earth station in respect of terrestrial stations in frequency bands for which a footnote refers to No. **S9.11A** allocated with equal rights to space and terrestrial services, where the coordination area of the earth station includes the territory of another country	See Table S5-2	The coordination area of the earth station covers the territory of another administration	See § 2 of Annex 1 of this Appendix	
MOD	No. **S9.16** Terrestrial/ non-GSO	A transmitting station in a terrestrial service within the coordination area of an earth station in a non-geostationary-satellite network in frequency bands for which a footnote refers to No. **S9.11A**	See Table S5-2	Transmitting terrestrial station is situated within the coordination area of a receiving earth station	See § 2 of Annex 1 of this Appendix	The coordination area of the affected earth station has already been determined using the calculation method of No. **S9.15**

TABLE S5-1 (*continued*)

	Reference of Article **S9**	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
MOD	No. **S9.17** GSO, non-GSO/ terrestrial	A specific earth station or a typical mobile earth station in frequency bands above 1 GHz allocated with equal rights to space and terrestrial services in respect of terrestrial stations, where the coordination area of the earth station includes the territory of another country with the exception of the coordination under No. **S9.15**	Any frequency band allocated to a space service, except those mentioned in the Plans in Appendix **S30A**	The coordination area of the earth station covers the territory of another administration	Appendix **S7** (For earth stations in the radiodetermination-satellite service (RDSS) in the bands 1 610-1 626.5 MHz, 2 483.5-2 500 MHz and 2 500-2 516.5 MHz, see Remarks column) 1) The coordination area of aircraft earth stations is determined by increasing the service area by 1 000 km with respect to the aeronautical mobile service (terrestrial) or 500 km with respect to terrestrial services other than the aeronautical mobile service	NOTE – For RDSS earth stations, a uniform coordination distance of 400 km corresponding to an airborne earth station shall be used. In cases where the earth stations are all ground-based, a coordination distance of 100 km shall be used

TABLE S5-1 (*continued*)

Reference of Article **S9**	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. **S9.17** GSO, non-GSO/ terrestrial (*cont.*)				2) For receiving earth stations in the meteorological-satellite service in frequency bands shared with the meteorological aids service, the coordination distance is considered to be the visibility distance as a function of the earth station horizon elevation angle for a radiosonde at an altitude of 20 km above mean sea level, assuming 4/3 Earth radius	Application of this provision with respect to Articles 6 and 7 of Appendices **S30** and **S30A** is suspended pending the decision of the 1999 World Radiocommunication Conference on the revision of these two Appendices

TABLE S5-1 (*continued*)

	Reference of Article **S9**	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
MOD	No. **S9.17A** GSO, non-SO/ GSO, non-GSO	A specific earth station in respect of other earth stations operating in the opposite direction of transmission in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission, where the coordination area of the earth station includes the territory of another country or the earth station is located within the coordination area of a coordinated earth station, with the exception of the frequency bands subject to the Plans in Appendix **S30A**	Any frequency band allocated to a space service	The coordination area of the earth station covers the territory of another administration or the earth station is located within the coordination area of an earth station	i) For bands in Table S5-2, see § 2 of Annex 1 of this Appendix ii) See Recommendations ITU-R IS.847, ITU-R IS.848 and ITU-R IS.849	
MOD	No. **S9.18** Terrestrial/GSO, non-GSO	Any transmitting station of a terrestrial service in the bands referred to in No. **S9.17** within the coordination area of an earth station, in respect of this earth station, with the exception of the coordination under Nos. **S9.16** and **S9.19**	Any frequency band allocated to a space service.	Transmitting terrestrial station is situated within the coordination area of a receiving earth station	See Remarks column	The coordination area of the affected earth station has already been determined using the calculation method of No. **S9.17**

TABLE S5-1 (*continued*)

	Reference of Article **S9**	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
MOD	No. **S9.19** Terrestrial/ GSO	A transmitting station in a terrestrial service in a frequency band shared on an equal primary basis with the BSS, except where the service is subject to the Plans in Appendix **S30**	Bands listed in No. **S9.11**	i) Necessary bandwidths overlap; and ii) the power flux-density of the terrestrial station at the edge of the BSS service area exceeds the permissible level	Check by using the assigned frequencies and bandwidths	
NOC	No. **S9.21**					

TABLE S5-1A

Applicability of No. S9.11A provisions

NOTE – Annex 1 to this Appendix contains the relevant coordination thresholds for sharing between mobile-satellite service (space-to-Earth) and terrestrial services as well as the relevant coordination areas for mobile earth stations operating below 3 GHz. It also contains the relevant coordination thresholds for sharing between non-geostationary mobile-satellite service feeder links (space-to-Earth) and terrestrial services as well as the relevant coordination areas for earth stations providing feeder links for non-geostationary satellites operating in the mobile-satellite service and for non-geostationary fixed-satellite service earth stations.

Frequency band	RR footnote/Res.	Space services* in No. **S9.11A**		Other space services* to which No. **S9.11A** applies equally	Date of provisional application of allocation if later than 22.11.1997
137-137.025 MHz 137.175-137.825 MHz	**S5.208**	MSS	↓	SPACE OPERATION METEOROLOGICAL-SATELLITE SPACE RESEARCH	
137.025-137.175 MHz 137.825-138 MHz	**S5.208**	mss	↓	---	
148-149.9 MHz	**S5.219**	MSS	↑	---	
149.9-150.05 MHz	**S5.220**	MSS	↑	--- (see **S5.220**)	Limited to LMSS until 1.1.2015
312-315 MHz	**S5.255**	mss	↑	---	
387-390 MHz	**S5.255**	mss	↓	---	
399.9-400.05 MHz	**S5.220**	MSS	↑	--- (see **S5.220**)	Limited to LMSS until 1.1.2015
400.15-401 MHz	**S5.264**	MSS	↓	METEOROLOGICAL-SATELLITE SPACE RESEARCH	
454-455 MHz	**S5.286A**	MSS (**S5.286D**, **S5.286E**)	↑	---	1.1.1999
455-456 MHz	**S5.286A**	MSS (R2, **S5.286E**)	↑	---	1.1.1999
459-460 MHz	**S5.286A**	MSS (R2, **S5.286E**)	↑	---	1.1.1999

Frequency band	RR foot-note/Res.	Space services* in No. **S9.11A**		Other space services* to which No. **S9.11A** applies equally	Date of provisional application of allocation if later than 22.11.1997
1 492-1 525 MHz	**S5.348**	MSS (R2, except USA)	↓	---	
1 525-1 530 MHz	**S5.354**	MSS	↓	SPACE OPERATION	1.1.1999 (LMSS, AMSS in Region 1)
1 530-1 533 MHz	**S5.354**	MSS	↓	SPACE OPERATION	1.1.1999 (AMSS)
1 533-1 535 MHz	**S5.354**	MSS	↓	SPACE OPERATION	1.1.1999 (LMSS, AMSS)
1 535-1 544 MHz	**S5.354**	MSS	↓	---	1.1.1999 (LMSS, AMSS)
1 544-1 545 MHz	**S5.354**	MSS	↓	---	
1 545-1 555 MHz	**S5.354**	MSS	↓	---	1.1.1999 (LMSS, MMSS)
1 555-1 559 MHz	**S5.354**	MSS	↓	---	1.1.1999 (AMSS, MMSS)
1 610-1 626.5 MHz	**S5.364**	MSS, RDSS (R2, **S5.369**)	↑	---	
1 610-1 626.5 MHz	**S5.364**	rdss (R1, R3,VEN)	↑	---	
1 613.8-1 626.5 MHz	**S5.365**	mss	↓	---	
1 626.5-1 631.5 MHz	**S5.354**	MSS	↑	---	(LMSS, AMSS in Region 1)
1 631.5-1 634.5 MHz	**S5.354**	MSS	↑	---	1.1.1999 (AMSS)
1 634.5-1 645.5 MHz	**S5.354**	MSS	↑	---	1.1.1999 (LMSS, AMSS)
1 645.5-1 646.5 MHz	**S5.354**	MSS	↑	---	
1 646.5-1 656.5 MHz	**S5.354**	MSS	↑	---	1.1.1999 (LMSS, MMSS)
1 656.5-1 660 MHz	**S5.354**	MSS	↑	---	1.1.1999 (AMSS, MMSS)
1 660-1 660.5 MHz	**S5.354**	MSS	↑	---	1.1.1999 (AMSS, MMSS)
1 675-1 700 MHz	**S5.377**	MSS (R2)	↑	--- (see **S5.377**)	
1 700-1 710 MHz	**S5.377**	MSS (R2)	↑	SPACE RESEARCH (**S5.384**)	
1 980-2 010 MHz	**S5.389A**	MSS	↑	---	1.1.2000 (1980-1990 MHz: 2005 in R2)
2 010-2 025 MHz	**S5.389C**	MSS (R2)	↑	---	1.1.2002 (1.1.2000 in CAN, USA)
2 160-2 170 MHz	**S5.389C**	MSS (R2)	↓	SPACE RESEARCH **S5.392A** (RUS)	1.1.2002 (1.1.2000 in CAN, USA)
2 170-2 200 MHz	**S5.389A**	MSS	↓	SPACE RESEARCH **S5.392A** (RUS)	1.1.2000

Frequency band	RR foot-note/Res.	Space services* in No. **S9.11A**		Other space services* to which No. **S9.11A** applies equally	Date of provisional application of allocation if later than 22.11.1997
2 483.5-2 500 MHz	**S5.402**	MSS RDSS (R2, **S5.400**)	↓	---	
2 483.5-2 500 MHz	**S5.402**	rdss (R1, R3)	↓	---	
2 500-2 520 MHz	**S5.414** **S5.403**	MSS	↓	FSS (R2, R3), RDSS (**S5.404**)	1.1.2005 (until 2005: Article **14**: MSS (–AMSS)) 1.1.2000 (AMSS in J)
2 520 -2 535 MHz	**S5.403**	MSS (–AMSS)	↓	BSS, FSS (R2, R3)	1.1.2000 (AMSS in J)
2 655-2 670 MHz	**S5.420**	MSS (–AMSS)	↑	BSS, FSS (R2, R3)	
2 670-2 690 MHz	**S5.419** **S5.420**	MSS	↑	FSS (R2, R3)	1.1.2005 (until 2005: Article **14**: MSS (–AMSS)) 1.1.2000 (AMSS in J)
5 091-5 150 MHz	**S5.444A**	FSS (limited to non-GSO MSS feeder link)	↑	AMSS (**S5.367**)	
5 150-5 250 MHz	**S5.447A** **S5.447C**	FSS (limited to non-GSO MSS feeder link)	↑	RDSS (**S5.447C**)	
5 150-5 216 MHz	**S5.447B**	FSS (limited to non-GSO MSS feeder link)	↓	RDSS (**S5.447C**)	
6 700-7 075 MHz	**S5.458B**	FSS (limited to non-GSO MSS feeder link)	↓	non-GSO FSS	
10.7-11.7 GHz	**S5.441** **S5.484A**	Non-GSO FSS	↓	---	see Res. **130****
11.7-12.2 GHz (R2) 12.2-12.75 GHz (R3) 12.5-12.75 GHz (R1)	**S5.484A**	Non-GSO FSS	↓	---	see Res. **130**
11.7-12.5 GHz (R1) 11.7-12.2 GHz (R3) 12.2-12.7 GHz (R2)	Res. **538**	Non-GSO FSS	↓	---	see Res. **538****
12.50-12.75 GHz (R1)	Res. **130**	Non-GSO FSS	↑	---	see Res. **130**
12.70-12.75 GHz (R2)	Res. **130**	Non-GSO FSS	↑	---	see Res. **130**
12.75-13.25 GHz	**S5.441**	Non-GSO FSS	↑	---	see Res. **130**

Frequency band	RR foot-note/Res.	Space services* in No. **S9.11A**		Other space services* to which No. **S9.11A** applies equally	Date of provisional application of allocation if later than 22.11.1997
13.75-14.5 GHz	**S5.484A**	Non-GSO FSS	↑	---	see Res. **130**
15.43-15.63 GHz	**S5.511A**	FSS (limited to non-GSO MSS feeder link)	↓	---	
15.63-15.65 GHz	**S5.511D**	FSS (limited to non-GSO MSS feeder link)	↓	FSS	
17.3-17.8 GHz (R2) 17.3-18.1 GHz (R1,R3)	Res. **538**	Non-GSO FSS	↑	BSS	see Res. **538**
17.8-18.1 GHz (R2)	Res. **538**	Non-GSO FSS	↑	---	see Res. **538**
17.8-18.6 GHz	**S5.484A**	Non-GSO FSS	↓	---	see Res. **130**, for 17.8-18.1 GHz see also Res. **538**
18.8-19.3 GHz	**S5.523A**	non-GSO FSS	↓	GSO FSS	
19.3-19.6 GHz	**S5.523B**	FSS (non-GSO MSS feeder link)	↑	---	
19.3-19.7 GHz	**S5.523D**	FSS (GSO and non-GSO MSS feeder link)	↓	---	
19.7-20.2 GHz	**S5.484A**	Non-GSO FSS	↓	---	see Res. **130**
27.5-28.6 GHz	**S5.484A**	non-GSO FSS	↑	---	see Res. **130**
28.6-29.1 GHz	**S5.523A**	non-GSO FSS	↑	GSO FSS	
29.1-29.5 GHz	**S5.535A**	FSS (GSO and non-GSO MSS feeder link)	↑		
29.5-30 GHz	**S5.484A**	non-GSO FSS	↑	---	see Res. **130**

* Note: AMSS: AERONAUTICAL MOBILE-SATELLITE SERVICE
BSS: BROADCASTING-SATELLITE SERVICE
FSS: FIXED-SATELLITE SERVICE
LMSS: LAND MOBILE-SATELLITE SERVICE
MMSS: MARITIME MOBILE-SATELLITE SERVICE
MSS: MOBILE-SATELLITE SERVICE
RDSS: RADIODETERMINATION-SATELLITE SERVICE
(small letters show secondary allocations.)

R1: Region 1
R2: Region 2
R3: Region 3
↓ space-to-Earth
↑ Earth-to-space

** For information: Non-GSO FSS systems operated in accordance with Resolutions **130 (WRC-97)** and **538 (WRC-97)** shall also apply the provisions of Nos. **S9.17** and **S9.17A**, as appropriate.

ANNEX 1

NOC

MOD 1.

1.1 *Below 1 GHz**

ADD 1.1.1 In the bands 137-138 MHz and 400.15-401 MHz, coordination of a space station of the mobile-satellite service (space-to-Earth) with respect to terrestrial services (except aeronautical mobile (OR) service networks operated by the administrations listed in Nos. **S5.204** and **S5.206** of the Radio Regulations as of 1 November 1996) is required only if the power flux-density produced by this space station exceeds –125 dB (W/m^2/4 kHz) at the Earth's surface.

ADD 1.1.2 In the band 137-138 MHz, coordination of a space station of the mobile-satellite service (space-to-Earth) with respect to the aeronautical mobile (OR) service is required only if the power flux-density produced by this space station at the Earth's surface exceeds:

– –125 dB (W/m^2/4 kHz) for networks for which complete Appendix **3** to the Radio Regulations coordination information has been received by the Bureau prior to 1 November 1996;

– –140 dB (W/m^2/4 kHz) for networks for which complete Appendix **3**/**S4** coordination information has been received by the Bureau after 1 November 1996 for the administrations referred to in § 1.1.1 above.

ADD 1.1.3 In the band 137-138 MHz, coordination is also required for a space station on a replacement satellite of a mobile-satellite service network for which complete Appendix **3** coordination information has been received by the Bureau prior to 1 November 1996 and the power flux-density exceeds –125 dB (W/m^2/4 kHz) at the Earth's surface for the administrations referred to in § 1.1.1 above.

NOC 1.2 to 1.2.2.2

---

* These provisions apply only to the mobile-satellite service.

MOD 1.2.2.2.1 *Characteristics of reference digital point-to-point systems*

Three different digital systems are described in the following table:

– 64 kbit/s capacity used, for example, for outside plant (individual subscriber connection);

– 2 Mbit/s capacity used, for example, for business subscriber connections for the local part of the inside plant;

– 45 Mbit/s capacity used, for example, for trunk networks.

Capacity	64 kbit/s	2 Mbit/s	45 Mbit/s
Modulation	4-PSK	8-PSK	64-QAM
Antenna gain (dB)	33	33	33
Transmit power (dBW)	7	7	1
Feeder/multiplexer loss (dB)	2	2	2
e.i.r.p. (dBW)	38	38	32
Receiver IF bandwidth (MHz)	0.032	0.7	10
Receiver noise figure (dB)	4	4.5	4
Receiver input level for a BER of 10^{-3} (dBW)	–137	–120	–106

Antenna pattern:

$$G(\varphi) = G_{max} - 2.5 \times 10^{-3} \left(\frac{D\varphi}{\lambda} \right)^2 \quad \text{for} \quad 0 < \varphi < \varphi_m$$

$$G(\varphi) = 39 - 5 \log (D/\lambda) - 2.5 \log \varphi \quad \text{for} \quad \varphi_m \leq \varphi < 48°$$

$$G(\varphi) = -3 - 5 \log (D/\lambda) \quad \text{for} \quad 48° \leq \varphi \leq 180°$$

where:

$G(\varphi)$: gain relative to an isotropic antenna (dBi)

φ: off-axis angle (degrees)

D: antenna diameter

λ: wavelength expressed in the same unit as D

G_1: gain of the first side-lobe $= 2 + 15 \log (D/\lambda)$

(D/λ may be estimated from $20 \log (D/\lambda) \approx G_{max} - 7.7$)

G_{max}: main lobe antenna gain (dBi)

$\varphi_m = 20 (\lambda/D) \times \sqrt{(G_{max} - G_1)}$

It should be noted that the above antenna radiation pattern corresponds to the average side-lobe pattern and it is recognized that individual side-lobes may exceed it by up to 3 dB.

MOD 1.2.2.2.2 *Characteristics of reference analogue point-to-point systems*

Reference circuit	12 hops with 50 km distance between stations
Antenna gain (dBi)	33
e.i.r.p. (dBW)	36
Feeder/multiplexer loss (dB)	3
Receiver noise figure (referred to input of receiver) (dB)	8
Maximum short- and long-term interference in the reference circuit: – baseband interfering signal power level not to be exceeded for more than 20% of the time – baseband interfering signal power level not to be exceeded for more than 0.01% of the time	 240 pWOp 50 000 pWOp

Antenna pattern: use antenna pattern of § 1.2.2.2.1.

MOD 1.2.2.2.3 *Characteristics of reference point-to-multipoint systems*

NOTE – In application of the standard computation program, the use of the point-to-multipoint reference fixed service system parameters for the 2 170-2 200 MHz band is not required.

Parameter	Central station	Outstation
Antenna type	Omni/sectoral	Dish/horn
Antenna gain (dBi)	10/13	20 (analogue) 27 (digital)
e.i.r.p. (max) (dBW): – analogue – digital	 12 24	 21 34
Noise figure (dB)	3.5	3.5
Feeder/multiplexer loss (dB)	2	2
IF bandwidth (MHz)	3.5	3.5

Antenna pattern:

For the outstation antenna pattern, the reference pattern described in § 1.2.2.2.1 is to be used.

The reference radiation pattern for omnidirectional or sectoral antennas is the following:

$$G(\theta) = G_0 - 12\,(\theta/\varphi_3)^2 \qquad \text{for} \quad 0 \le \theta < \varphi_3$$

$$G(\theta) = G_0 - 12 - 10\log(\theta/\varphi_3) \qquad \text{for} \quad \varphi_3 \le \theta < 90°$$

where:

G_0: maximum gain in the horizontal plane (dBi)

θ: radiation angle above the horizontal plane (degrees)

φ_3 (degrees) is given by:

$$\varphi_3 = \frac{1}{\alpha^2 - 0.818}$$

where:

$$\alpha = \frac{10^{0.1G_0} + 172.4}{191}$$

NOC 1.2.3

MOD 1.2.3.1 *Method for the determination of the need for coordination between mobile-satellite service space stations (space-to-Earth) and other terrestrial services sharing the same frequency band in the 1 to 3 GHz range*

Coordination of assignments for transmitting space stations of the mobile-satellite service with respect to terrestrial services is not required if the power flux-density (pfd) produced at the Earth's surface or the fractional degradation in performance (FDP) of a station in the fixed service does not exceed the threshold values shown in the following table.

TABLE S5-2

Frequency band (MHz)	Terrestrial service to be protected	Coordination threshold values				
		Geostationary space stations		Non-geostationary space stations		
		pfd (per space station) calculation factors (NOTE 2)		pfd (per space station) calculation factors (NOTE 2)		% FDP (in 1 MHz) (NOTE 1)
		P	*r* dB/degrees	*P*	*r* dB/degrees	
1 492-1 525	Analogue fixed service telephony (NOTE 5)	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	
	All other cases (NOTE 4)	–128 dB(W/m^2) in 1 MHz	0.5	–128 dB(W/m^2) in 1 MHz	0.5	25
1 525-1 530	Analogue fixed service telephony (NOTE 5)	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	
	All other cases	–128 dB(W/m^2) in 1 MHz	0.5	–128 dB(W/m^2) in 1 MHz	0.5	25
2 160-2 200 (NOTE 3)	Analogue fixed service telephony (NOTE 5)	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	–141 dB(W/m^2) in 4 kHz and –123 dB (W/m^2) in 1 MHz (NOTE 6)	0.5	
	All other cases	–128 dB(W/m^2) in 1 MHz	0.5	–123 dB(W/m^2) in 1 MHz (NOTE 6)	0.5	25

TABLE S5-2 (*end*)

Frequency band (MHz)	Terrestrial service to be protected	Coordination threshold values				
		Geostationary space stations		Non-geostationary space stations		
		pfd (per space station) calculation factors (NOTE 2)		pfd (per space station) calculation factors (NOTE 2)		% FDP (in 1 MHz) (NOTE 1)
		P	*r* dB/degrees	*P*	*r* dB/degrees	
2 483.5-2 500	All cases	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	–144 dB(W/m^2) in 4 kHz and –126 dB(W/m^2) in 1 MHz (NOTE 7)	0.65	
2 500-2 520	Analogue fixed service telephony (NOTE 5)	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	
	All other cases	–128 dB(W/m^2) in 1 MHz	0.5	–128 dB (W/m^2) in 1 MHz	0.5	25
2 520-2 535	Analogue fixed service telephony (NOTE 5)	–154 dB(W/m^2) in 4 kHz and –136 dB(W/m^2) in 1 MHz	0.75	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	
	All other cases	–136 dB(W/m^2) in 1 MHz	0.75	–128 dB(W/m^2) in 1 MHz	0.5	25

NOTE 1 – The calculation of FDP is contained in § 1.2.2.1, using the reference fixed service parameters contained in § 1.2.2.2.1 and 1.2.2.2.3. The use of FDP threshold is limited to the case of digital fixed service systems.

NOTE 2 – The following formula should be used for deriving the coordination threshold in terms of pfd:

P	for	$0° \le \delta \le 5°$
$P + r\,(\delta - 5)$	for	$5° < \delta \le 25°$
$P + 20\,r$	for	$25° < \delta \le 90°$

where δ is the angle of arrival (degrees).

The threshold values are obtained under assumed free-space propagation conditions.

NOTE 3 – The coordination thresholds in the band 2 160-2 270 MHz (Region 2) and 2 170-2 200 MHz (all Regions) to protect other terrestrial services do not apply to International Mobile Telecommunications-2000 (IMT-2000) systems, as the satellite and the terrestrial components are not intended to operate in the same area or on common frequencies within these bands.

NOTE 4 – Exceptions for the band 1 492-1 525 MHz are as follows:

4.1 For the land mobile service on the territory of Japan (No. **S5.348A** of the Radio Regulations): –150 dB(W/m^2) in 4 kHz at all angles of arrival is applicable to all satellite space-to-Earth emissions.

4.2 For the aeronautical mobile service for telemetry (No. **S5.343** of the Radio Regulations), the requirement for coordination is determined by frequency overlap (No. **S5.348** of the Radio Regulations).

NOTE 5 – In all cases involving sharing with analogue systems for telephony in the fixed service, further coordination is only required when the power flux-density values are greater than or equal to the coordination threshold values in both reference bandwidths.

NOTE 6 – The power flux-density values specified for the band 2 160-2 200 MHz provide full protection for analogue radio-relay systems using the sharing criteria established by Recommendation ITU-R SF.357, for operation with a non-geostationary mobile-satellite service system employing narrow-band time division multiple access/frequency division multiple access techniques.

NOTE 7 – The power flux-density values specified for the band 2 483.5-2 500 MHz provide full protection for analogue radio-relay systems using the sharing criteria established by Recommendation ITU-R SF.357, for operation with multiple non-geostationary mobile-satellite service systems employing code division multiple access techniques. The power flux-density values specified will not provide full protection for existing digital fixed systems in all cases. However, these power flux-density values are considered to provide adequate protection for digital fixed systems designed to operate in this band, where high-power industrial, scientific and medical equipment and possible low-power applications are expected to produce a relatively high interference environment.

NOC 1.2.3.2 to 3.1

3.2 *General considerations*

Two types of coordination distances are specified in Tables 1-4:

– predetermined distances;

– distances that are to be calculated on a case-by-case basis, taking into account specific parameters of the earth station for which the coordination area is being determined.

Neither of these distances indicate required separation distances.

It must be emphasized that the presence or installation of another station within the coordination area of an earth station would not necessarily preclude the satisfactory operation of either the earth station or the other station, since coordination distances are based on the most unfavourable case assumptions as regards interference.

The different coordination distances may be reviewed at a future conference conforming to the relevant Resolution.

MOD

TABLE 1

Earth stations operating at frequencies below 1 GHz

Frequency sharing situation		Coordination distance (In sharing situations involving services allocated with equal rights)
Frequency band and earth station for which coordination area is determined	Other service or station	
148-149.9 MHz ground-based (mobile)	Ground-based stations	As determined using Equation (1) and Figure 1 of Recommendation ITU-R M.1185 In this case, the coordination distance is calculated by the administration of the terrestrial station using the parameters of its terrestrial stations and the most up-to-date relevant parameters published by the Bureau for the earth station.
149.9-150.05 MHz ground-based (mobile) 399.9-400.05 MHz ground-based (mobile)	Radionavigation-satellite service	The coordination distance is calculated by the administration of the mobile-satellite service earth station using the parameters of its earth stations and the most up-to-date relevant parameters published by the Bureau for the radionavigation-satellite service earth station
400.15-401 MHz ground-based	Meteorological aids (radiosonde)	580 km
All bands below 1 GHz ground-based	Mobile (aircraft)	500 km

TABLE 1 (*end*)

Frequency sharing situation		Coordination distance (In sharing situations involving services allocated with equal rights)
Frequency band and earth station for which coordination area is determined	Other service or station	
All bands below 1 GHz aircraft (mobile)	Ground-based stations	500 km
400.15-401 MHz aircraft (mobile)	Meteorological aids (radiosonde)	1 080 km
All bands below 1 GHz aircraft (mobile)	Mobile (aircraft)	1 000 km
454-456 MHz 459-460 MHz ground-based	Ground-based stations	500 km

MOD TABLE 2

Earth stations operating at frequencies in the 1-3 GHz range

Frequency sharing situation		Coordination distance (In sharing situations involving services allocated with equal rights)
Frequency band and earth station for which coordination area is determined	Other service or station (station in terrestrial service or earth station)	
Ground-based mobile (NOTE 1) (GSO network)	Ground-based stations in terrestrial services	Determined using Recommendation ITU-R IS.847 with the parameters specified therein for terrestrial stations and all applicable equations and figures
Ground-based mobile (NOTE 1) (non-GSO network)	Ground-based stations in terrestrial services	The methodology of Recommendation ITU-R IS.849 is applied in conjunction with Recommendation ITU-R IS.847 (see above)
1 675-1 700 MHz ground-based mobile	Meteorological aids (radiosonde)	580 km
All bands 1-3 GHz ground-based mobile	Terrestrial mobile (aircraft)	500 km
All bands aircraft (mobile)	Ground-based stations in terrestrial services	500 km
1 675-1 700 MHz aircraft (mobile)	Meteorological aids (radiosonde)	1 080 km
All bands aircraft (mobile)	Terrestrial mobile (aircraft)	1 000 km

NOTE 1 – Recommendation ITU-R IS.847 supplies the necessary terrestrial station parameters for the bands 1 492-1 530 MHz, 1 555-1 559 MHz, 1 610-1 645.5 MHz, 1 646.5-1 660 MHz, 1 675-1 710 MHz, 1 980-2 025 MHz, 2 160-2 200 MHz, 2 483.5-2 520 MHz, and 2 655-2 690 MHz.

NOC TABLE 3

NOC TABLE 4

APPENDIX S13*

Distress and Safety Communications (Non-GMDSS)

(see Article **S30**)

PART A

Part A1. General Provisions

MOD § 1. The provisions specified in this Appendix are obligatory (see Resolution **331 (Rev.WRC-97)**) in the maritime mobile service for stations using the frequencies and techniques prescribed in this Appendix and for communications between those stations and aircraft stations. However, stations of the maritime mobile service, when additionally fitted with any of the equipment used by stations operating in conformity with the provisions specified in Chapter **SVII** shall, when using that equipment, comply with the appropriate provisions of that Chapter. The provisions of this Appendix are also applicable to the aeronautical mobile service except in the case of special arrangements between the governments concerned.

NOC § 2. to § 9.

(MOD) § 9. *a)* until the full implementation of the Global Maritime Distress and Safety System (GMDSS), of transmitting preferably class A2A or H2A and receiving preferably class A2A and H2A emissions on the carrier frequency 500 kHz or, on the carrier frequency 2 182 kHz, transmitting class J3E or H3E and receiving class A3E, J3E and H3E emissions[1] or, on the carrier frequency 4 125 kHz, transmitting and receiving class J3E emissions or, on the carrier frequency 156.8 MHz, transmitting and receiving class G3E emissions (see also Resolution **331 (Rev.WRC-97)**);

***** For the purposes of this Appendix, distress and safety communications include distress, urgency and safety calls and messages.

NOC § 9. *b)*

MOD § 10. All provisions of the Radio Regulations pertaining to the distress, urgency and safety communications using the techniques and frequencies described in this Appendix shall be maintained in force for all stations using these techniques and frequencies for distress, urgency and safety communications (see Resolution **331 (Rev.WRC-97)**).

Part A2. Frequencies for Distress and Safety

Section I. Availability of Frequencies

NOC § 1. (1) to § 1A.

C. 2 182 kHz

MOD § 2. (1) The carrier frequency 2 182 kHz is an international distress frequency for radiotelephony (see also Nos. **S5.108** and **S5.111**); it shall be used for this purpose by ship, aircraft and survival craft stations and by emergency position-indicating radiobeacons using frequencies in the authorized bands between 1 605 kHz and 4 000 kHz when requesting assistance from the maritime services. It is used for distress calls and distress traffic, for signals of emergency position-indicating radiobeacons, for the urgency signal and urgency messages and for the safety signal. Safety messages shall be transmitted, where practicable, on a working frequency after a preliminary announcement on 2 182 kHz. The class of emission to be used for radiotelephony on the frequency 2 182 kHz shall be J3E. The class of emission to be used by emergency position-indicating radiobeacons shall be as specified in Appendix **S19** (see also Part A5, § 3.). Distress traffic on 2 182 kHz following the reception of a distress call using digital selective calling should take into account that some shipping in the vicinity may not be able to receive this traffic (see also Appendix **S15** and Resolution **331 (Rev.WRC-97)**).

NOC § 2. (2) to § 12

Section II. Protection of Distress and Safety Frequencies

NOC § 13. to § 14A. (2)

B. 500 kHz

MOD § 15. (1) Apart from the transmissions authorized on 500 kHz, and taking account of No. **S52.28**, all transmissions on the frequencies included between 495 kHz and 505 kHz are forbidden. Until 1 February 1999, this applies to frequencies between 490 kHz and 510 kHz.

NOC § 15. (2) to § 18. (2)

Section III. Watch on Distress Frequencies

A. 500 kHz

(MOD) § 19. (1) In order to increase the safety of life at sea and over the sea, all stations of the maritime mobile service normally keeping watch on frequencies in the authorized bands between 415 kHz and 526.5 kHz which employ Morse telegraphy shall, during their hours of service, take the necessary measures to ensure watch on the international distress frequency 500 kHz for three minutes twice an hour beginning at x h 15 and x h 45, Coordinated Universal Time (UTC), by an operator using headphones or loudspeaker (see also Resolution **331 (Rev.WRC-97)**).

NOC § 19. (1A) to § 19. (2)

MOD § 19. (2) *a)* transmissions shall cease in the band between 490 kHz and 510 kHz. From 1 February 1999, this band is reduced to the band between 495 kHz and 505 kHz;

NOC § 19. (2) *b)* to § 20. (5)

ADD § 20A. The provisions of § 19. to 20. remain mandatory until 1 February 1999.

B. 2 182 kHz

MOD § 21. (1) Coast stations which are open to public correspondence and which form an essential part of the coverage of the area for distress purposes using the techniques and frequencies described in this Appendix on 2 182 kHz should, during their hours of service, maintain a watch on 2 182 kHz (see also Resolution **331 (Rev.WRC-97)**). Such watch should be indicated in the List of Coast Stations.

MOD (2) These stations should maintain this watch by means of an operator using some aural method, such as headphones, split headphones or loudspeaker.

MOD (3) In addition, ship stations should keep the maximum watch practicable on the carrier frequency 2 182 kHz for receiving by any appropriate means the radiotelephone alarm signal described in Part A5, § 6. (1), and the navigational warning signal described in Part A5, § 12. (1), (2) and (3), as well as distress, urgency and safety signals. (See also Resolution **331 (Rev.WRC-97)**.)

MOD § 22. Ship stations open to public correspondence should, as far as possible during their hours of service, keep watch on 2 182 kHz (see also Resolution **331 (Rev.WRC-97)**).

MOD § 23. In order to increase the safety of life at sea and over the sea, all stations of the maritime mobile service normally keeping watch on frequencies in the authorized bands between 1 605 kHz and 2 850 kHz using the techniques described in this Appendix for distress purposes should, during their hours of service, and as far as possible, take steps to keep watch on the international distress carrier frequency 2 182 kHz for three minutes twice each hour beginning at x h 00 and x h 30, Coordinated Universal Time (UTC) (see also Resolution **331 (Rev.WRC-97)**). Such watch, in the case of coast stations, should be indicated in the List of Coast Stations.

NOC § 23A.

ADD § 23B. The provisions of § 21. to 23A. remain mandatory until 1 February 1999.

MOD *C. 4 125 kHz, 6 215 kHz, 8 291 kHz, 12 290 kHz and 16 420 kHz*

MOD § 24. (1) All coast stations which are open to public correspondence and which form an essential part of the coverage of the area for distress purposes may, during their hours of service, maintain a watch on the carrier frequencies 4 125 kHz, 6 215 kHz, 8 291 kHz, 12 290 kHz and 16 420 kHz (see § 4. (1) and 6. above, as well as Table S15-1 of Appendix **S15**). Such watch should be indicated in the List of Coast Stations.

NOC § 24. (2)

D. 156.8 MHz

MOD § 25. (1) A coast station providing an international maritime mobile radiotelephone service in the band 156-174 MHz and which forms an essential part of the coverage of the area for distress purposes using the techniques and frequencies described in this Appendix should, during its working hours in that band, maintain an efficient aural watch on 156.8 MHz (see also Resolution **331 (Rev.WRC-97)**). Such watch should be indicated in the List of Coast Stations.

MOD (2) Ship stations should, where practicable, maintain watch on 156.8 MHz when within the service area of a coast station providing international maritime mobile radiotelephone service in the band 156-174 MHz, using the techniques and frequencies described in this Appendix. Ship stations fitted only with radiotelephone equipment operating in the authorized bands between 156 MHz and 174 MHz should maintain watch on 156.8 MHz when at sea (see also Resolution **331 (Rev.WRC-97)**).

MOD (3) Ship stations, when in communication with a port station, using the techniques and frequencies described in this Appendix, may on an exceptional basis and subject to the agreement of the administration concerned, continue to maintain watch, on the appropriate port operations frequency only, provided that watch on 156.8 MHz is being maintained by the port station (see also Resolution **331 (Rev.WRC-97)**). Such watch by port stations should be indicated in the List of Coast Stations.

MOD (4) Ship stations, when in communication with a coast station in the ship movement service using the techniques and frequencies described in this Appendix, and subject to the agreement of the administrations concerned, may continue to maintain watch on the appropriate ship movement service frequency only, provided the watch on 156.8 MHz is being maintained by the coast station (see also Resolution **331 (Rev.WRC-97)**). Such watch by coast stations in the ship movement service should be indicated in the List of Coast Stations.

NOC Part A3. to Part B. Section III

MOD

APPENDIX S15

Frequencies for Distress and Safety Communications for the Global Maritime Distress and Safety System (GMDSS)

(see Article **S31**)

The frequencies for distress and safety communications for the GMDSS are given in Tables S15-1 and S15-2 for frequencies below and above 30 MHz, respectively.

(MOD)

TABLE S15-1

Frequencies below 30 MHz

MOD

TABLE S15-2

Frequencies above 30 MHz (VHF/UHF)

Frequency (MHz)	Description of usage	Notes
…	…	…
1 530-1 544	SAT-COM	In addition to its availability for routine non-safety purposes, the band 1 530-1 544 MHz is used for distress and safety purposes in the space-to-Earth direction in the maritime mobile-satellite service. GMDSS distress, urgency and safety communications have priority in this band; see No. **S5.353A**.
…	…	…
1 626.5-1 645.5	SAT-COM	In addition to its availability for routine non-safety purposes, the band 1 626.5-1 645.5 MHz is used for distress and safety purposes in the Earth-to-space direction in the maritime mobile-satellite service. GMDSS distress, urgency and safety communications have priority in this band; see No. **S5.353A**.

MOD

APPENDIX S18

Table of Transmitting Frequencies in the VHF Maritime Mobile Band

(see Article **S52**)

NOTE – For assistance in understanding the Table, see notes *a)* to *n)* below.

Channel designator	Notes	Transmitting frequencies (MHz)		Intership	Port operations and ship movement		Public correspondence
		Ship stations	Coast stations		Single frequency	Two frequency	
60		156.025	160.625			x	x
01		156.050	160.650			x	x
61		156.075	160.675			x	x
02		156.100	160.700			x	x
62		156.125	160.725			x	x
03		156.150	160.750			x	x
63		156.175	160.775			x	x
04		156.200	160.800			x	x
64		156.225	160.825			x	x
05		156.250	160.850			x	x
65		156.275	160.875			x	x
06	*f)*	156.300		x			
66		156.325	160.925			x	x
07		156.350	160.950			x	x
67	*h)*	156.375	156.375	x	x		
08		156.400		x			
68		156.425	156.425		x		
09	*i)*	156.450	156.450	x	x		
69		156.475	156.475	x	x		
10	*h)*	156.500	156.500	x	x		
70	*j)*	156.525	156.525	Digital selective calling for distress, safety and calling			
11		156.550	156.550		x		

Channel designator	Notes	Transmitting frequencies (MHz)		Intership	Port operations and ship movement		Public corres-pondence
		Ship stations	Coast stations		Single frequency	Two frequency	
71		156.575	156.575		x		
12		156.600	156.600		x		
72	*i)*	156.625		x			
13	*k)*	156.650	156.650	x	x		
73	*h), i)*	156.675	156.675	x	x		
14		156.700	156.700		x		
74		156.725	156.725		x		
15	*g)*	156.750	156.750	x	x		
75	*n)*	156.775			x		
16		156.800	156.800	DISTRESS, SAFETY AND CALLING			
76	*n)*	156.825			x		
17	*g)*	156.850	156.850	x	x		
77		156.875		x			
18	*m)*	156.900	161.500		x	x	x
78		156.925	161.525			x	x
19		156.950	161.550			x	x
79		156.975	161.575			x	x
20		157.000	161.600			x	x
80		157.025	161.625			x	x
21		157.050	161.650			x	x
81		157.075	161.675			x	x
22		157.100	161.700			x	x
82	*m)*	157.125	161.725		x	x	x
23		157.150	161.750			x	x
83	*m)*	157.175	161.775		x	x	x
24		157.200	161.800			x	x
84	*m)*	157.225	161.825		x	x	x
25		157.250	161.850			x	x

Channel designator	Notes	Transmitting frequencies (MHz)		Intership	Port operations and ship movement		Public corres-pondence
		Ship stations	Coast stations		Single frequency	Two frequency	
85	*m)*	157.275	161.875		x	x	x
26		157.300	161.900			x	x
86	*m)*	157.325	161.925		x	x	x
27		157.350	161.950			x	x
87		157.375			x		
28		157.400	162.000			x	x
88		157.425			x		
AIS 1	*l)*	161.975	161.975				
AIS 2	*l)*	162.025	162.025				

Notes referring to the Table

General notes

a) Administrations may designate frequencies in the intership, port operations and ship movement services for use by light aircraft and helicopters to communicate with ships or participating coast stations in predominantly maritime support operations under the conditions specified in Nos. **S51.69**, **S51.73**, **S51.74**, **S51.75**, **S51.76**, **S51.77** and **S51.78**. However, the use of the channels which are shared with public correspondence shall be subject to prior agreement between interested and affected administrations.

b) The channels of the present Appendix, with the exception of channels 06, 13, 15, 16, 17, 70, 75 and 76, may also be used for high-speed data and facsimile transmissions, subject to special arrangement between interested and affected administrations.

c) The channels of the present Appendix, but preferably channel 28 and with the exception of channels 06, 13, 15, 16, 17, 70, 75 and 76, may be used for direct-printing telegraphy and data transmission, subject to special arrangement between interested and affected administrations.

d) The frequencies in this table may also be used for radiocommunications on inland waterways in accordance with the conditions specified in No. **S5.226**.

e) Administrations having an urgent need to reduce local congestion may apply 12.5 kHz channel interleaving on a non-interference basis to 25 kHz channels, provided:

- Recommendation ITU-R M.1084-2 shall be taken into account when changing to 12.5 kHz channels;
- it shall not affect the 25 kHz channels of the Appendix **S18** maritime mobile distress and safety frequencies, especially the channels 06, 13, 15, 16, 17, and 70, nor the technical characteristics mentioned in Recommendation ITU-R M.489-2 for those channels;
- implementation of 12.5 kHz channel interleaving and consequential national requirements shall be subject to prior agreement between the implementing administrations and administrations whose ship stations or services may be affected.

Specific notes

f) The frequency 156.300 MHz (channel 06) (see No. **S51.79** and Appendices **S13** and **S15**) may also be used for communication between ship stations and aircraft stations engaged in coordinated search and rescue operations. Ship stations shall avoid harmful interference to such communications on channel 06 as well as to communications between aircraft stations, ice-breakers and assisted ships during ice seasons.

g) Channels 15 and 17 may also be used for on-board communications provided the effective radiated power does not exceed 1 W, and subject to the national regulations of the administration concerned when these channels are used in its territorial waters.

h) Within the European Maritime Area and in Canada, these frequencies (channels 10, 67, 73) may also be used, if so required, by the individual administrations concerned, for communication between ship stations, aircraft stations and participating land stations engaged in coordinated search and rescue and anti-pollution operations in local areas, under the conditions specified in Nos. **S51.69, S51.73, S51.74, S51.75, S51.76, S51.77** and **S51.78**.

i) The preferred first three frequencies for the purpose indicated in note *a)* are 156.450 MHz (channel 09), 156.625 MHz (channel 72) and 156.675 MHz (channel 73).

j) Channel 70 is to be used exclusively for digital selective calling for distress, safety and calling.

k) Channel 13 is designated for use on a worldwide basis as a navigation safety communication channel, primarily for intership navigation safety communications. It may also be used for the ship movement and port operations service subject to the national regulations of the administrations concerned.

l) These channels (AIS 1 and AIS 2) will be used for an automatic ship identification and surveillance system capable of providing worldwide operation on high seas, unless other frequencies are designated on a regional basis for this purpose.

m) These channels (18 and 82 to 86) may be operated as single frequency channels, subject to special arrangement between interested or affected administrations.

n) The use of these channels (75 and 76) should be restricted to navigation-related communications only and all precautions should be taken to avoid harmful interference to channel 16, e.g. by limiting the output power to 1 W or by means of geographical separation.

APPENDIX S30

Provisions for All Services and Associated Plans for the Broadcasting-Satellite Service in the Frequency Bands 11.7-12.2 GHz (in Region 3), 11.7-12.5 GHz (in Region 1) and 12.2-12.7 GHz (in Region 2)

NOC ARTICLE 1

NOC ARTICLE 2

ARTICLE 3

Execution of the Provisions and Associated Plans

(MOD) 3.1 The Member States of the Union in Regions 1, 2 and 3 shall adopt, for their broadcasting-satellite space stations[1] operating in the frequency bands referred to in this Appendix, the characteristics specified in the appropriate Regional Plan and the associated provisions.

(MOD) 3.2 The Member States of the Union shall not change the characteristics specified in the Region 1 and Region 3 Plans or in the Region 2 Plan, or bring into use assignments to broadcasting-satellite space stations or to stations in the other services to which these frequency bands are allocated, except as provided for in the Radio Regulations and the appropriate Articles and Annexes of this Appendix.

---

[1] In Region 2, such stations may also be used for transmissions in the fixed-satellite service (space-to-Earth) in accordance with No. **S5.492** of the Radio Regulations.

ARTICLE 4

Procedure for Modifications to the Plans

(MOD) 4.1 When an administration intends to make a modification[1] to one of the Regional Plans, i.e.:

a) to modify the characteristics of any of its frequency assignments to a space station[2] in the broadcasting-satellite service which are shown in the appropriate Regional Plan, or for which the procedure in this Article has been successfully applied, whether or not the station has been brought into use; *or*

b) to include in the appropriate Regional Plan a new frequency assignment to a space station in the broadcasting-satellite service; *or*

c) to cancel a frequency assignment to a space station in the broadcasting-satellite service;

the following procedure shall be applied before any notification of the frequency assignment is made to the Radiocommunication Bureau (see Article 5 of this Appendix);

MOD 4.1.1 Before an administration proposes to include in the Plan, under the provisions of § 4.1 *b)*, a new frequency assignment to a space station or to include in the Plan new frequency assignments to a space station whose orbital position is not designated in the Plan for this administration, all the assignments to the service area involved should have been brought into service or have been notified to the Bureau in accordance with the relevant provisions of the Plan.

---

[1] The intention not to employ energy dispersal in accordance with § 3.18 of Annex 5 shall be treated as a modification and thus subject to the appropriate provisions of this Article.

[2] The expression “frequency assignment to a space station”, wherever it appears in this Article, shall be understood to refer to a frequency assignment associated with a given orbital position. See also Annex 7 for the orbital limitations.

NOC 4.2 to 4.3.1.2

SUP 4.3.1.3

NOC 4.3.1.4

(MOD) 4.3.1.5 having a frequency assignment in the band 11.7-12.2 GHz in Region 2 or 12.2-12.5 GHz in Region 3 to a space station in the fixed-satellite service which is recorded in the Master Register or which has been coordinated or is being coordinated under the provisions of No. **S9.7** of the Radio Regulations, or those of § 7.2.1 of this Appendix;

NOC 4.3.1.6 to 4.3.3.2

SUP 4.3.3.3

NOC 4.3.3.4

(MOD) 4.3.3.5 having a frequency assignment in the band 12.5-12.7 GHz in Region 1 or 12.2-12.7 GHz in Region 3 to a space station in the fixed-satellite service which is recorded in the Master Register or which has been coordinated or is being coordinated under the provisions of No. **S9.7** of the Radio Regulations or those of § 7.2.1 of this Appendix; *or*

NOC 4.3.3.6 to 4.5

MOD 4.5.1 *a)* The Bureau shall maintain an up-to-date master copy of the Regions 1 and 3 Plan taking account of the application of the procedure specified in this Article. The Bureau shall publish a document listing the amendments to be made to the Plan as a result of modifications made in accordance with the procedure in this Article.

NOC 4.5.1 *b)* and 4.5.2

ARTICLE 5

Notification, Examination and Recording in the Master Register of Frequency Assignments to Space Stations in the Broadcasting-Satellite Service

NOC 5.1 to 5.2

MOD 5.2.1 *a)* with respect to its conformity with the Constitution, the Convention and the relevant provisions of the Radio Regulations (with the exception of those relating to § *b)*, *c)* and *d)* below);

NOC 5.2.1 *b)* to 5.3.2

ARTICLE 6

(MOD) **Coordination, Notification and Recording in the Master International Frequency Register of Frequency Assignments to Terrestrial Stations Affecting Broadcasting-Satellite Frequency Assignments in the Frequency Bands 11.7-12.2 GHz (in Region 3), 11.7-12.5 GHz (in Region 1) and 12.2-12.7 GHz (in Region 2)**[1]

NOC **Section I.**

Section II. Notification Procedure for Frequency Assignments

(MOD) 6.2.1 Any frequency assignment to a fixed, land or broadcasting station shall be notified to the Radiocommunication Bureau if the use of the frequency concerned is capable of causing harmful interference to the service rendered or to be rendered by a broadcasting-satellite station of any other administration, or if it is desired to obtain international recognition of the use of the frequency[2].

(MOD) 6.2.2 For this notification, an individual notice for each frequency assignment shall be drawn up as prescribed in Appendix **S4**, Annexes 1A and 1B to the Radio Regulations, which specifies the basic characteristics to be furnished as required. It is recommended that the notifying administration should also supply the additional data called for in that Appendix, together with such further data as it may consider appropriate.

NOC 6.2.3 and 6.2.4

---

[1] These procedures do not replace the procedures prescribed for terrestrial stations in Articles **S9** and **S11** of the Radio Regulations.

[2] The attention of administrations is specifically drawn to the provisions of Section I of this Article.

Section III. Procedure for the Examination of Notices and the Recording of Frequency Assignments in the Master Register

(MOD) 6.3.1 Whatever the means of communication, including telegram, by which a notice is transmitted to the Bureau, it shall be considered complete if it contains at least the appropriate basic characteristics specified in Appendix **S4**, Annexes 1A and 1B to the Radio Regulations.

NOC 6.3.2 to 6.3.7

MOD 6.3.8 – with respect to its conformity with the Constitution, the Convention, the relevant provisions of the Radio Regulations and the provisions of this Appendix (with the exception of those relating to the coordination procedure and the probability of harmful interference);

NOC 6.3.9 to 6.3.33

(MOD) 6.3.34 Any notice of a change in the basic characteristics of an assignment already recorded in the Master Register, as specified in Appendix **S4**, Annexes 1A and 1B to the Radio Regulations (except those entered in Columns 2c, 3 and 4a of the Master Register), shall be examined by the Bureau in accordance with the provisions of § 6.3.8 and 6.3.9 and, where appropriate, § 6.3.10 and the provisions of § 6.3.12 to 6.3.32 inclusive shall be applied. Where the change should be recorded, the original assignment shall be amended according to the notice.

NOC 6.3.35 to 6.3.41

ARTICLE 7

Procedures for Coordination, Notification and Recording in the Master International Frequency Register of Frequency Assignments to Stations in the Fixed-Satellite Service in the Frequency Bands 11.7-12.2 GHz (in Region 2), 12.2-12.7 GHz (in Region 3) and 12.5-12.7 GHz (in Region 1), When Frequency Assignments to Broadcasting-Satellite Stations in Conformity with the Regions 1 and 3 Plan, or the Region 2 Plan, Respectively, Are Involved[1]

Section I. Procedure for the Advance Publication of Information on Planned Fixed-Satellite Systems

Publication of Information

(MOD) 7.1.1 An administration which intends to establish a fixed-satellite system shall, prior to the procedure described in § 7.2.1, where applicable, send to the Radiocommunication Bureau, not earlier than five years and preferably not later than two years before the date of bringing into service each satellite network of the planned system, the information listed in Appendix **S4**, Annexes 2A and 2B to the Radio Regulations.

NOC 7.1.2 and 7.1.3

Comments on Published Information

(MOD) 7.1.4 If, after studying the information published under § 7.1.3, any administration is of the opinion that interference which may be unacceptable may be caused to its frequency assignments in conformity with the appropriate

[1] These provisions do not replace the procedures prescribed in Articles **S9** and **S11** of the Radio Regulations when stations other than those of the broadcasting-satellite service are involved.

Regional Plan, it shall, within three months after the date of the weekly circular publishing the information listed in Appendix **S4**, Annexes 2A and 2B, to the Radio Regulations, send its comments to the administration concerned. A copy of these comments shall also be sent to the Bureau. If no such comments are received from an administration within the period mentioned above, it may be assumed that that administration has no basic objections to the planned fixed-satellite network(s) of that system of which details have been published.

NOC 7.1.5 to 7.1.7

Commencement of Coordination or Notification Procedure

(MOD) 7.1.8 In complying with the provisions of § 7.1.5 and 7.1.6, an administration responsible for a planned fixed-satellite system shall, if necessary, defer its commencement of the coordination procedure of § 7.2.1 or, where this is not applicable, the sending of its notices to the Bureau until five months after the date of the weekly circular containing the information listed in Appendix **S4**, Annexes 2A and 2B to the Radio Regulations on the relevant satellite network. However, in respect of those administrations with which difficulties have been resolved or which have responded favourably, the coordination procedure, where applicable, may be commenced prior to the expiry of the five months mentioned above.

Section II. Coordination Procedures to be Applied in Appropriate Cases

NOC 7.2.1 *a)*

(MOD) *b)* the power flux-density which would be produced by the proposed fixed-satellite assignment exceeds the value specified in Annex 4.

For this purpose, the administration seeking agreement shall send to any other such administration the information listed in Appendix **S4**, Annexes 2A and 2B to the Radio Regulations.

NOC 7.2.2

(MOD) 7.2.3 An administration seeking coordination under § 7.2.1 shall at the same time send to the Bureau a copy of the request for coordination together with the information listed in Appendix **S4**, Annexes 2A and 2B to the Radio Regulations and the name(s) of the administration(s) whose agreement is sought. The Bureau shall determine on the basis of Annex 4 which frequency assignments in conformity with the appropriate Regional Plan are considered to be affected. The Bureau shall include the names of those administrations with the information received from the administration seeking coordination and shall publish this information in a special section of its Weekly Circular, together with a reference to the Weekly Circular in which details of the satellite system were published in accordance with Section I of this Article. When the Weekly Circular contains such information, the Bureau shall so inform all administrations by circular telegram.

NOC 7.2.4 to 7.2.13

Section III. Notification of Frequency Assignments

NOC 7.3.1 and 7.3.2

(MOD) 7.3.3 For any notification under § 7.3.1 or 7.3.2, an individual notice for each frequency assignment shall be drawn up as prescribed in Appendix **S4**, Annexes 2A and 2B to the Radio Regulations, the various Sections of which specify the basic characteristics to be furnished according to the case. The notifying administration shall furnish such further data as it considers appropriate.

NOC 7.3.4 and 7.3.5

Section IV. Procedure for the Examination of Notices and the Recording of Frequency Assignments in the Master Register

(MOD) 7.4.1 Any notice which does not contain at least those basic characteristics specified in Appendix **S4**, Annexes 2A and 2B to the Radio Regulations shall

be returned by the Bureau immediately, by airmail, to the notifying administration with the reasons therefor.

NOC 7.4.2 to 7.4.5

MOD 7.4.5.1 with respect to its conformity with the Constitution, the Convention, the relevant provisions of the Radio Regulations and the provisions of this Appendix (with the exception of those relating to the coordination procedures and the probability of harmful interference);

NOC 7.4.5.2 to 7.4.5.12

(MOD) 7.4.12.1 A notice of a change in the basic characteristics of an assignment in the fixed-satellite service already recorded, as specified in Appendix **S4**, Annexes 2A and 2B to the Radio Regulations (except the name of the station or the name of the locality in which it is situated or the date of bringing into use), shall be examined by the Bureau in conformity with § 7.4.5.1 and, where appropriate, § 7.4.5.2 and 7.4.5.3, and the provisions of § 7.4.7 to 7.4.11.3 inclusive shall apply. Where the change should be recorded, the original assignment shall be amended accordingly.

NOC 7.4.12.2 to 7.8.6

NOC ARTICLE 8

NOC ARTICLE 9

NOC ARTICLE 10

MOD ARTICLE 11

Plan for the Broadcasting-Satellite Service in the Frequency Bands 11.7-12.2 GHz in Region 3 and 11.7-12.5 GHz in Region 1

11.1 COLUMN HEADINGS OF THE PLAN

Col. 1. *Notifying administration symbol*.

Col. 2. *Beam identification* (Column 2, normally, contains the symbol designating the country or the geographical area taken from Table B1 of the Preface to the International Frequency List, followed by the symbol designating the service area).

Col. 3. *Nominal orbital position*, in degrees and hundredths of a degree from the Greenwich meridian (negative values indicate longitudes which are west of the Greenwich meridian; positive values indicate longitudes which are east of the Greenwich meridian).

Col. 4. *Channel number*.

Col. 5. *Nominal intersection of the beam axis with the Earth* (boresight or aim point in the case of a non-elliptical beam), longitude and latitude, in degrees and hundredths of a degree.

Col. 6. *Space station transmitting antenna characteristics* (elliptical beams). This column contains three numerical values corresponding to the major axis, the minor axis and the major axis orientation respectively of the elliptical cross-section half-power beamwidth, in degrees and hundredths of a degree. Orientation of the ellipse is determined as follows: in a plane normal to the beam axis, the direction of a major axis of the ellipse is specified as the angle measured anticlockwise from a line parallel to the equatorial plane to the major axis of the ellipse, to the nearest degree.

Col. 7. *Space station transmitting antenna pattern code*.

Col. 8. *Space station transmitting antenna shaped (non-elliptical) beam identification*.

Col. 9. *Maximum space station transmitting antenna co-polar and cross-polar (in the case of shaped beam) isotropic gain*, in dBi.

Col. 10. *Earth station receiving antenna pattern code*.

Col. 11. *Polarization* (CL - circular left, CR - circular right, LE - linear referenced to the equatorial plane) and polarization angle in degrees and hundredths of a degree (in the case of linear polarization only).

Col. 12. *E.i.r.p.* in the direction of maximum radiation, in dBW.

Col. 13. *Designation of emission*.

Col. 14. *Identity of the space station*.

Col. 15. *Group code* (An identification code which indicates that all assignments with the same group identification code will be treated as a group)

Col. 16. *Assignment status*.

Col. 17. *Remarks*.

The codes used for the antenna pattern of the transmitting space station (downlink) antenna are defined as follows:

R13TSS	Figure 9 and § 3.13.3 in Annex 5 of Appendix **S30**
R123FR	Figure 11 and § 3.13.3 in Annex 5 of Appendix **S30**
RAD_TSS	RADIOSAT-3 antenna pattern (antenna pattern data supplied by the administration of France)

In cases where the “Space station transmitting antenna pattern” field is blank, the necessary antenna pattern data are provided by shaped beam data submitted by the administration. These data are stored in column 8. A particular shaped beam is identified by the combination of column 1, column 8 and column 14. In such cases the maximum cross-polar gain is given in the “Cross-polar gain” field.

The codes used for receiving earth station (downlink) antenna patterns are defined as follows:

R13RES	Figure 7 and § 3.7.2 in Annex 5 of Appendix **S30**
MODRES	Recommendation ITU-R BO.1213

The assignment status codes used for beams are defined as follows:

P	Assignment in the Plan for which § 4.3.5 (in terms of 8 years lapsing period) of this Appendix does not apply.
PE	Assignment in the Plan for which § 4.3.5 (in terms of 8 years lapsing period) of this Appendix does not apply. These assignments have been notified and brought into use and the date of bringing into use has been confirmed to the Bureau. For this category of assignments, the parameters in force before WRC-97 are applied.
A	Assignment in the Plan for which § 4.3.5 (in terms of 8 years lapsing period) of this Appendix applies.
AE	Assignment in the Plan for which § 4.3.5 (in terms of 8 years lapsing period) of this Appendix applies. These assignments have been notified and brought into use and the date of bringing into use has been confirmed to the Bureau. For this category of assignments, the parameters in force before WRC-97 are applied.

Group code: If an assignment is part of the group:

a) The equivalent protection margin to be used for the application of Article 4 of this Appendix shall be calculated on the following basis:

– for the calculation of interference to assignments that are part of a group, only the interference contributions from assignments that are not part of the same group are to be included; and

– for the calculation of interference from assignments belonging to a group of assignments that are not part of that same group, only the worst interference contribution from that group shall be used on a test point to test point basis.

b) If an administration notifies the same frequency in more than one beam of a group for use at the same time, the aggregate carrier-to-interference ratio (*C/I*) produced by all emissions from that group shall not exceed the *C/I* ratio calculated on the basis of § *a)* above.

11.2 TEXT FOR SYMBOLS IN REMARKS COLUMN OF THE PLAN

1. To be dedicated to the Islamic programme envisaged in the Conference[1] documents.

2. This assignment results from a common requirement of the administrations of Denmark and Iceland. The service area includes the Faroe Islands and Iceland. The assignment may, after consultations between the two administrations, be used by either of them.

3. Provisional beam. This assignment has been included in the Plan by WRC-97. This assignment is for exclusive use by Palestine, subject to the Israeli-Palestinian Interim Agreement of 28 September 1995, Resolution 741 of the ITU Council notwithstanding.

4. Assignment intended to ensure coverage of Algeria, Libya, Morocco, Mauritania and Tunisia, with the agreement of the countries concerned. If required, it may be used with the characteristics of the beam TUN 150.

5. This assignment shall be brought into use only when the limits given in Table 1 are not exceeded or with the agreement of the affected administrations identified in Table 2 with respect to:

a) assignments in the Region 2 Plan on 27 October 1997; or

---

[1] The World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977).

b) assignments in the terrestrial services which are recorded in the Master Register with a favourable finding or received by the Bureau prior to 27 October 1997 for recording in the Master Register and which subsequently receive a favourable finding based on the Plan as it existed on 27 October 1997; or

c) assignments in the fixed-satellite service that: are recorded in the Master Register with a favourable finding; or those which have been coordinated under the provisions of No. **1060** of the Radio Regulations or § 7.2.1 of Appendix **S30**; or those that are in process of coordination under the provisions of No. **1060** of the Radio Regulations or § 7.2.1 of Appendix **S30** prior to 27 October 1997.

These administrations shall be informed by the notifying administration of changes in characteristics before these beams are brought into use.

6. This assignment shall not claim protection from the assignments of the administrations indicated in Table 3 which are in conformity with the Region 2 Plan on 27 October 1997.

7. This assignment shall not claim protection from the assignments of the administration indicated in Table 3 which are recorded in the Master Register with a favourable finding prior to 27 October 1997 to which No. **S5.487**/No. **838** and No. **S5.43**/No. **435** of the Radio Regulations do not apply.

8. Pending clarification of bringing into service of the satellite network.

TABLE 1

Symbol	Criteria
a	§ 3. of Annex 1*
b	§ 4., 5. *a)* and 5. *b)* of Annex 1*
c	§ 6. of Annex 1*
* These paragraphs and this Annex are contained in the Radio Regulations in force at the time of WRC-97.	

TABLE 2

Beam name	Channels	Ref. Table 1	Affected administrations*
ARM06400	24	b	AZE GEO IRN RUS TUR
	28, 32, 36, 40	b	AZE GEO IRN TUR
	28, 32, 36, 40	c	CHN INS J PAK SNG THA TON UAE
AZE06400	4, 8, 12, 16, 20	b	ARM GEO IRN RUS TUR
AZR13400	33, 37	a	G
	21	c	CAN E MLA USA VEN/ASA
BHR2550A	23	b	QAT UAE
BIH14800	2, 6, 10, 14, 18	b	ALB AUT CZE GRC HNG HRV I ROU SVK SVN YUG
BLR06200	1, 5, 9, 13, 17	b	LTU LVA MDA RUS SVK UKR
BRU3300A	16, 18	b	INS MLA
BTN03100	5, 9, 13	b	BGD IND NPL
	17	b	BGD CHN IND
CHN19000	1, 5, 9, 13	b	POR/MAC
COM2070A	19	b	F/MYT

* Administrations whose assignment(s) may receive interference from the beam shown in the left-hand column.

TABLE 2 (*continued*)

Beam name	Channels	Ref. Table 1	Affected administrations*
CPV30100	24	c	MLA
CZE14400	23, 27, 31, 35, 39	b	AUT BIH D DNK HNG HRV I POL SVK SVN
	27, 31, 35, 39	c	UAE
ERI09200	23, 27, 31, 35, 39	b	ARS DJI ETH SDN SOM YEM
	27	c	INS J MLA PAK SNG TON UAE
	31, 35, 39	c	CHN INS J KOR MLA PAK SNG THA TON UAE USA
EST06100	1, 5, 9, 13, 17	c	FIN LTU LVA NOR RUS S
	1, 5, 9, 13	c	USA/IT
FJI1930A	13	b	F/WAL
FSM00000	3, 7, 11, 15	b	KIR MHL F/OCE PLW
	19	b	KIR MHL NRU F/OCE PLW
	3, 7, 11, 15, 19	c	ARG J MHL MLA USA/IT USA VEN/ASA
G UKDBS	30, 34, 38	a	GUY JMC
	22	b	BLR EST LTU LVA POL RUS
	26, 30, 34, 38	b	BLR EST LTU LVA POL
	22	c	CAN USA
GEO06400	22	b	ARM AZE IRN RUS TUR
	26, 30, 34, 38	b	ARM AZE IRN TUR
	26	c	J MLA PAK SNG TON UAE
	30, 34, 38	c	CHN INS J KOR MLA PAK PNG SNG THA TON UAE USA
HISPASA2	1, 2, 5, 7, 9, 11, 13, 15, 17, 19	b	KAZ

* Administrations whose assignment(s) may receive interference from the beam shown in the left-hand column.

TABLE 2 (*continued*)

Beam name	Channels	Ref. Table 1	Affected administrations*
HRV14800	1, 5, 9, 13, 17	b	ALB AUT BIH BUL CZE D GRC HNG I MKD ROU SUI SVK SVN YUG
ISL04900	29	a	JMC
	33, 37	a	GUY JMC
ISR1100A	21	b	ARS AZE EGY IRN IRQ JOR LBN SYR TKM
KGZ07000	26, 30, 34, 38	b	AFG CHN KAZ MNG RUS TJK TKM UZB
	26	c	INS J MLA PAK SNG TON UAE
	30, 34, 38	c	CHN INS J KOR MLA PAK PNG SNG THA TON UAE USA
KIR00001	3, 7, 11	b	USA/HWL MHL NZL/TKL TUV
	3, 7, 11	c	ARG J MHL MLA USA/IT USA VEN/ASA
KIR00002	15, 19, 23	b	USA/JAR F/OCE USA/PLM
	15, 19, 23	c	ARG CAN J MHL MLA USA USA/IT VEN/ASA
LBR2440A	19	b	CTI GUI SRL
	19	c	ARG USA
LVA06100	21	b	BLR EST FIN LTU NOR POL RUS
	25, 29, 33, 37	b	BLR EST FIN LTU NOR POL
	29, 33, 37	c	UAE
MDA06300	4, 8, 12, 16, 20	b	ROU UKR
MKD14800	2, 6, 10, 14, 18	b	ALB BUL GRC HRV ROU YUG
MLA2280A	10	b	BRU INS PHL
MLT1470A	20	b	I TUN

* Administrations whose assignment(s) may receive interference from the beam shown in the left-hand column.

TABLE 2 (*end*)

Beam name	Channels	Ref. Table 1	Affected administrations*
NMB0250A	21	b	AGL BOT F/CRO LSO MAU MDG MOZ F/REU SWZ ZMB ZWE
	21	c	ARG E MEX MLA USA VEN/ASA
NPL1220A	23	b	BGD BTN CHN IND
POR13300	21, 25, 29, 33, 37	b	E
ROU13600	3, 7, 11, 15, 19	b	ALB BIH BLR BUL CZE HNG HRV MDA MKD POL TUR YUG
	3, 7, 11	c	USA/IT
RUS00400	25	b	CHN J KRE
	27, 31, 35, 39	b	J KRE
	25	c	G J MLA PAK SNG TON
	27	c	CHN G INS J PNG SNG THA TON
	31, 35	c	CHN G INS J KOR LAO PNG SNG THA TON USA
	39	c	CHN G INS J KOR LAO PNG SNG THA TON
SLM00000	1, 5, 9, 13	c	USA/IT
SVN14800	4, 8, 12, 16, 20	b	BIH CZE D HNG HRV I SMR SVK YUG
TJK06900	1, 5, 9, 13, 17	b	AFG CHN KAZ KGZ PAK TKM UZB
TKM06800	23	b	AFG AZE GEO IRN KAZ KGZ RUS TJK UZB
	27, 31, 35, 39	b	AFG AZE GEO IRN KAZ KGZ TJK UZB
	27	c	INS J MLA PAK PNG SNG TON UAE
	31, 35, 39	c	CHN INS J KOR MLA PAK PNG SNG THA TON UAE USA
UKR06300	3, 7, 11, 15, 19	b	AUT BLR BUL CZE DNK/FRO GEO HNG HRV ISL LVA MDA NOR POL RUS TUR YUG
UZB07100	3, 7, 11, 15, 19	b	AFG CHN KAZ KGZ PAK TJK TKM
YYY00001	1, 5, 9, 13, 17	b	ARS EGY ISR JOR LBN SYR

* Administrations whose assignment(s) may receive interference from the beam shown in the left-hand column.

TABLE 3

Beam name	Channels	Affected administrations**
ARM06400	28, 32, 36, 40	PAK
AUS0040A	3, 7, 11	USA/IT
AUS0040B	3, 7, 11	USA/IT
AUS0040C	3, 7, 11	USA/IT
AUS0070A	15, 19, 23	J
	3, 7, 11	J USA/IT
AUS0090A	1, 5, 9, 13	J USA/IT
	17, 21	J
AUS0090B	1, 5, 9, 13	J USA/IT
	17, 21	J
AZE06400	4, 8, 12	USA/IT
AZR13400	21, 25	E
BFA10700	21, 25	E
BIH14800	2, 6, 10	USA/IT
BLR06200	1, 5, 9	USA/IT
BTN03100	5, 9	USA/IT
CPV30100	24	E USA/IT
CTI23700	22	E
D 08700	2, 6, 10	USA/IT
EST06100	1, 5, 9	USA/IT
FJI1930A	13	USA/IT
FSM00000	11	J MHL USA/IT
	3, 7, 15, 19	J MHL
G 02700	4, 8, 12, 16, 20	USA/IT

** Administrations whose assignment(s) may cause interference to the beam shown in the left-hand column.

TABLE 3 (*continued*)

Beam name	Channels	Affected administrations**
G UKDBS	22, 26	USA/IT
	30, 34, 38	GUY JMC
GEO06400	26, 30, 34, 38	PAK
GNB30400	14, 18	E USA/IT
	2, 6, 10	USA/IT
HISPASA2	1, 3, 5, 7, 9, 11, 13	USA/IT
HRV14800	1, 5, 9	USA/IT
IRL21100	2, 6, 10, 14, 18	USA/IT
ISL04900	21, 25	USA/IT
	29	JMC
	33, 37	GUY JMC
ISR1100A	21	USA
KAZ06600	28, 32, 36, 40	THA UAE
KGZ07000	26	UAE
	30, 34, 38	THA UAE
KIR00001	3, 7, 11	USA/IT
LBR24400	3, 7, 11, 15	USA/IT
LBR2440A	19	USA/IT
LTU06100	3, 7, 11	USA/IT
MDA06300	4, 8, 12	USA/IT
MHL00000	10	J USA/IT
	2, 6, 14, 18	J
MKD14800	2, 6, 10	USA/IT
MLA2280A	10	USA/IT

** Administrations whose assignment(s) may cause interference to the beam shown in the left-hand column.

TABLE 3 (*end*)

Beam name	Channels	Affected administrations**
MLD3060A	4, 8	USA/IT
MLT1470A	20	USA
PLW00000	4, 16, 20	J MHL
	8, 12	J MHL USA/IT
POR13300	21, 25	E
ROU13600	3, 7, 11	USA/IT
RUS00400	25	J
	27	CHN J SNG
	31, 35	CHN G J SNG
	39	CHN G J
SLM00000	1, 5	J MHL
	9, 13	J MHL USA/IT
SRL25900	23	USA/IT
	27	GUY
	31, 35	GUY JMC
	39	JMC
SVN14800	4, 8, 12	USA/IT
TJK06900	1, 5, 9	USA/IT
TUV00000	2, 6, 10	USA/IT
UKR06300	3, 7, 11	USA/IT
UZB07100	3, 7, 11	USA/IT
VTN32500	3, 7, 11	USA/IT
YEM26600	2, 6, 10	USA/IT
YEM26700	1, 5, 9, 13	USA/IT
YYY00001	1, 5, 9, 13	USA/IT

** Administrations whose assignment(s) may cause interference to the beam shown in the left-hand column.

11.3 TABLE SHOWING CORRESPONDENCE BETWEEN CHANNEL NUMBERS AND ASSIGNED FREQUENCIES

Channel No.	Assigned frequency (MHz)	Channel No.	Assigned frequency (MHz)
1	11 727.48	21	12 111.08
2	11 746.66	22	12 130.26
3	11 765.84	23	12 149.44
4	11 785.02	24	12 168.62
5	11 804.20	25	12 187.80
6	11 823.38	26	12 206.98
7	11 842.56	27	12 226.16
8	11 861.74	28	12 245.34
9	11 880.92	29	12 264.52
10	11 900.10	30	12 283.70
11	11 919.28	31	12 302.88
12	11 938.46	32	12 322.06
13	11 957.64	33	12 341.24
14	11 976.82	34	12 360.42
15	11 996.00	35	12 379.60
16	12 015.18	36	12 398.78
17	12 034.36	37	12 417.96
18	12 053.54	38	12 437.14
19	12 072.72	39	12 456.32
20	12 091.90	40	12 475.50

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
AFG	AFG24600	50.00	1	64.50	33.10	1.44	1.40	21.00	R13TSS		41.40		MODRES	CR		58.40	27M0F8W			P	
AUS	AUS00900	164.00	1	147.50	-32.10	2.31	1.43	187.00	R13TSS		39.25		MODRES	CR		59.25	27M0F8W		78	P	
AUS	AUS0090A	164.00	1	159.06	-31.52	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		78	P	7
AUS	AUS0090B	164.00	1	167.93	-29.02	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		78	P	7
BLR	BLR06200	38.00	1	27.91	53.06	1.21	0.60	11.47	R13TSS		45.83		MODRES	CL		58.93	27M0F8W			P	5, 7
CHN	CHN15500	62.00	1	88.30	31.50	3.38	1.45	162.00	R13TSS		37.54		MODRES	CL		57.94	27M0F8W			P	
CHN	CHN16200	92.00	1	115.90	21.00	2.74	2.42	23.00	R13TSS		36.23		MODRES	CL		58.93	27M0F8W			P	
CHN	CHN16300	79.80	1	116.00	39.20	1.20	0.80	132.00	R13TSS		44.62		MODRES	CR		59.42	27M0F8W			P	
CHN	CHN19000	122.00	1	114.17	23.32	0.91	0.60	2.88	R13TSS		47.08		MODRES	CR		58.88	27M0F8W			P	5
CME	CME30000	-13.00	1	12.70	6.20	2.54	1.68	87.00	R13TSS		38.15		MODRES	CR		58.45	27M0F8W			P	
E	HISPASA2	-30.00	1	-8.80	35.40	3.00	1.90	45.00	R13TSS		36.90		MODRES	CL		59.00	27M0F8W	HISPASAT-2		A	5, 7
EST	EST06100	23.00	1	25.01	58.47	0.72	0.60	9.93	R13TSS		48.09		MODRES	CL		58.89	27M0F8W			P	5, 7
F	F 09300	-19.00	1	2.60	45.90	2.50	0.98	160.00	R13TSS		40.56		R13RES	CR		63.76	27M0F8W		19	PE	
F	F 09306	-7.00	1	2.60	45.90	2.50	0.98	160.00	R13TSS		41.00		MODRES	CR		58.90	27M0F8W	RADIOSAT	19	A	
F	F3_A2751	-7.00	1	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3351	-7.00	1	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2751	-7.00	1	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3351	-7.00	1	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	1	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	1	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	1	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	1	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	1	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	1	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	1	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
FJI	FJI19300	152.00	1	179.40	-17.90	1.04	0.98	67.00	R13TSS		44.36		MODRES	CR		58.66	27M0F8W			P	
GUI	GUI19200	-37.00	1	-11.00	10.20	1.58	1.04	147.00	R13TSS		42.29		MODRES	CL		58.39	27M0F8W			P	
HRV	HRV14800	34.00	1	16.74	44.54	0.88	0.69	5.30	R13TSS		46.57		MODRES	CL		58.87	27M0F8W			P	5, 7
IND	IND03900	56.00	1	72.70	11.20	1.26	0.60	107.00	R13TSS		45.66		MODRES	CR		58.06	27M0F8W			P	
IND	IND04401	68.00	1	79.50	22.30	2.19	1.42	146.00	R13TSS		39.52		MODRES	CR		58.32	27M0F8W			P	
INS	INS03500	104.00	1	124.30	-3.20	3.34	1.94	82.00	R13TSS		36.33		MODRES	CR		58.23	27M0F8W			P	
J	000BS-3N	109.85	1	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		63.20	27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	1	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		63.20	27M0F8W		33	PE	
LBY	LBY28000	-25.00	1	21.40	26.00	2.50	1.04	119.00	R13TSS		40.30		MODRES	CL		58.50	27M0F8W			P	
MDG	MDG23600	29.00	1	46.60	-18.80	2.72	1.14	65.00	R13TSS		39.53		MODRES	CL		58.33	27M0F8W			P	
NZL	NZL05500	158.00	1	172.30	-39.70	2.88	1.56	47.00	R13TSS		37.92		MODRES	CR		58.32	27M0F8W			P	
POL	POL13200	-1.00	1	19.30	51.80	1.46	0.64	162.00	R13TSS		44.74		MODRES	CL		59.14	27M0F8W			P	
QAT	QAT24700	17.00	1	51.10	25.30	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		56.78	27M0F8W			P	
SLM	SLM00000	146.00	1	159.32	-8.40	1.50	1.18	140.48	R13TSS		41.98		MODRES	CL		58.88	27M0F8W			P	5, 7

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
SMR	SMR31100	-37.00	1	12.60	43.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.38	27M0F8W			P	
SWZ	SWZ31300	-1.00	1	31.50	-26.50	0.62	0.60	66.00	R13TSS		48.74		MODRES	CR		57.84	27M0F8W			P	
THA	THA14200	74.00	1	100.70	13.20	2.82	1.54	106.00	R13TSS		38.07		MODRES	CL		58.57	27M0F8W			P	
TJK	TJK06900	44.00	1	71.14	38.37	1.25	0.76	159.15	R13TSS		44.65		MODRES	CL		58.85	27M0F8W			P	5, 7
TUR	TUR14500	5.00	1	34.40	38.90	2.68	1.04	168.00	R13TSS		40.00		MODRES	CR		58.70	27M0F8W			P	
USA	PLM33700	170.00	1	-161.40	7.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.38	27M0F8W		9	P	
USA	PLM33701	170.00	1	-161.40	7.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.38	27M0F8W		9	P	
USA	SMA33500	170.00	1	-170.10	-14.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.08	27M0F8W		13	P	
USA	SMA33501	170.00	1	-170.10	-14.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.08	27M0F8W		13	P	
USA	WAK33400	140.00	1	166.50	19.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.58	27M0F8W		11	P	
USA	WAK33401	140.00	1	166.50	19.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.58	27M0F8W		11	P	
YEM	YEM26700	11.00	1	48.61	14.42	1.68	1.44	157.35	R13TSS		40.61		MODRES	CL		58.91	27M0F8W			P	7
	YYY00001	11.00	1	34.99	31.86	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	3, 5, 7
ALG	ALG25100	-25.00	2	4.20	33.20	2.45	1.25	172.00	R13TSS		39.59		MODRES	CR		58.39	27M0F8W			P	
ARS	ARS27500	17.00	2	48.30	24.60	3.84	1.20	138.00	R13TSS		37.81		MODRES	CL		57.71	27M0F8W			P	
AUS	AUS00600	152.00	2	136.60	-30.90	2.41	1.52	161.00	R13TSS		38.80		MODRES	CL		58.40	27M0F8W			P	
AUS	AUS00800	164.00	2	145.90	-21.70	3.62	1.63	136.00	R13TSS		36.73		MODRES	CL		58.83	27M0F8W			P	
BIH	BIH14800	34.00	2	17.77	44.32	0.62	0.60	166.84	R13TSS		48.71		MODRES	CR		58.91	27M0F8W			P	5, 7
BOT	BOT29700	-1.00	2	23.30	-22.20	2.13	1.50	36.00	R13TSS		39.40		MODRES	CL		58.70	27M0F8W			P	
CHN	CHN15400	62.00	2	83.90	40.50	2.75	2.05	177.00	R13TSS		36.94		MODRES	CR		58.24	27M0F8W			P	
CHN	CHN16100	92.00	2	118.10	31.10	2.49	1.69	117.00	R13TSS		38.21		MODRES	CR		59.41	27M0F8W			P	
CLN	CLN21900	50.00	2	80.60	7.70	1.18	0.60	106.00	R13TSS		45.95		MODRES	CR		58.65	27M0F8W			P	
D	D 08700	-19.00	2	9.60	49.90	1.62	0.72	147.00	R13TSS		43.78		MODRES	CL		60.48	27M0F8W			P	7
F	F2_A2722	-7.00	2	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2722	-7.00	2	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2762	-7.00	2	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2722	-7.00	2	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A2762	-7.00	2	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3322	-7.00	2	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_A3362	-7.00	2	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2722	-7.00	2	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D2762	-7.00	2	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3322	-7.00	2	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	F3_D3362	-7.00	2	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	NCL10000	140.00	2	166.00	-21.00	1.14	0.72	146.00	R13TSS		45.30		MODRES	CR		58.70	27M0F8W		6	P	
F	NCL10001	140.00	2	166.00	-21.00	1.14	0.72	146.00	R13TSS		45.30		MODRES	CR		58.70	27M0F8W		6	P	
F	WAL10200	140.00	2	-176.80	-14.00	0.74	0.60	29.00	R13TSS		47.97		MODRES	CR		59.37	27M0F8W		8	P	
F	WAL10201	140.00	2	-176.80	-14.00	0.74	0.60	29.00	R13TSS		47.97		MODRES	CR		59.37	27M0F8W		8	P	
F /EUT	E2WA7DA2	29.00	2	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F /EUT	E2WA7DB2	29.00	2	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	2	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	2	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	2	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	2	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	2	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
FIN	FIN10300	5.00	2	22.50	64.50	1.38	0.76	171.00	R13TSS		44.24		MODRES	CL		62.74	27M0F8W			P	
GNB	GNB30400	-30.00	2	-15.00	12.00	0.90	0.60	172.00	R13TSS		47.12		MODRES	CL		58.12	27M0F8W			P	7
IND	IND03700	68.00	2	93.00	25.50	1.46	1.13	40.00	R13TSS		42.27		MODRES	CL		58.87	27M0F8W			P	
IND	IND04501	56.00	2	76.20	19.50	1.58	1.58	21.00	R13TSS		40.47		MODRES	CL		58.47	27M0F8W			P	
INS	INS02800	80.20	2	101.50	0.00	3.00	1.20	133.00	R13TSS		38.88		MODRES	CL		58.28	27M0F8W			P	
IRL	IRL21100	-33.50	2	-8.20	53.20	0.84	0.60	162.00	R13TSS		47.42		MODRES	CR		59.22	27M0F8W			P	7
KOR	KO11201D	116.00	2	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40		R13RES	CL		63.60	27M0G7W	KOREASAT-1	20	AE	
KOR	KOR11200	110.00	2	127.50	36.00	1.24	1.02	168.00	R13TSS		43.43		MODRES	CL		58.63	27M0F8W		20	P	
KOR	KOR11201	116.00	2	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40		R13RES	CL		63.60	27M0F8W	KOREASAT-1	20	AE	
LAO	LAO28400	74.00	2	103.70	18.10	2.16	0.78	133.00	R13TSS		42.18		MODRES	CR		58.78	27M0F8W			P	
MAU	MAU24200	29.00	2	59.80	-18.90	1.62	1.24	55.00	R13TSS		41.42		MODRES	CR		59.02	27M0F8W			P	
MHL	MHL00000	146.00	2	167.64	9.83	2.07	0.90	157.42	R13TSS		41.75		MODRES	CR		58.95	27M0F8W			P	7
MKD	MKD14800	23.00	2	21.61	41.56	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5, 7
MLA	MLA22800	86.00	2	114.10	3.90	2.34	1.12	45.00	R13TSS		40.26		MODRES	CR		58.56	27M0F8W			P	
MLI	MLI32700	-37.00	2	-2.00	19.00	2.66	1.26	127.00	R13TSS		39.19		MODRES	CR		58.19	27M0F8W			P	
NOR	BIFROS22	-0.80	2	17.00	61.50					NO9	32.00	6.00	MODRES	CR		54.50	27M0FXF	BIFROST-2		A	
NZL	CKH05200	158.00	2	-161.00	-19.80	1.02	0.64	132.00	R13TSS		46.30		MODRES	CL		59.60	27M0F8W		3	P	
NZL	CKH05201	158.00	2	-161.00	-19.80	1.02	0.64	132.00	R13TSS		46.30		MODRES	CL		59.60	27M0F8W		3	P	
PAK	PAK12700	38.00	2	69.60	29.50	2.30	2.16	14.00	R13TSS		37.49		MODRES	CR		58.89	27M0F8W		73	P	
PAK	PAK12701	38.00	2	69.60	29.50	2.30	2.16	14.00	R13TSS		37.49		MODRES	CR		58.89	27M0F8W		73	P	
PNG	PNG13100	110.00	2	147.70	-6.30	2.50	2.18	169.00	R13TSS		37.08		MODRES	CR		59.38	27M0F8W			P	
TCD	TCD14300	-13.00	2	18.10	15.50	3.40	1.72	107.00	R13TSS		36.78		MODRES	CL		58.98	27M0F8W			P	
TGO	TGO22600	-25.00	2	0.80	8.60	1.52	0.60	105.00	R13TSS		44.85		MODRES	CL		58.45	27M0F8W			P	
TUV	TUV00000	176.00	2	177.61	-7.11	0.94	0.60	137.58	R13TSS		46.93		MODRES	CR		58.93	27M0F8W			P	7
USA	GUM33100	122.00	2	144.50	13.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		58.28	27M0F8W		15	P	
USA	GUM33101	122.00	2	144.50	13.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		58.28	27M0F8W		15	P	
YEM	YEM26600	11.00	2	44.00	15.67	0.80	0.60	114.88	R13TSS		47.66		MODRES	CR		58.86	27M0F8W			P	7
ZAI	ZAI32300	-19.00	2	21.30	-6.80	2.80	1.52	149.00	R13TSS		38.16		MODRES	CR		59.56	27M0F8W			P	
AFG	AFG24500	50.00	3	70.20	35.50	1.32	1.13	53.00	R13TSS		42.71		MODRES	CR		57.81	27M0F8W			P	
AUS	AUS00400	152.00	3	123.00	-24.20	3.06	2.17	102.00	R13TSS		36.22		MODRES	CR		58.22	27M0F8W		76	P	
AUS	AUS0040A	152.00	3	96.83	-12.19	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	7
AUS	AUS0040B	152.00	3	105.69	-10.45	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	7
AUS	AUS0040C	152.00	3	110.52	-66.28	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	7

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
AUS	AUS00700	164.00	3	145.20	-38.10	2.12	1.02	147.00	R13TSS		41.09		MODRES	CR		58.49	27M0F8W		77	P	
AUS	AUS0070A	164.00	3	158.94	-54.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		77	P	7
BEN	BEN23300	-19.00	3	2.20	9.50	1.44	0.68	97.00	R13TSS		44.54		MODRES	CL		58.34	27M0F8W			P	
CHN	CHN15700	62.00	3	102.30	27.80	2.56	1.58	127.00	R13TSS		38.38		MODRES	CL		60.08	27M0F8W			P	
CHN	CHN16000	92.00	3	122.80	45.30	2.50	1.45	150.00	R13TSS		38.85		MODRES	CL		60.05	27M0F8W			P	
COM	COM20700	29.00	3	44.10	-12.10	0.76	0.60	149.00	R13TSS		47.86		MODRES	CL		58.06	27M0F8W			P	
E	HISPASA2	-30.00	3	-8.80	35.40	3.00	1.90	45.00	R13TSS		36.90		MODRES	CL		59.00	27M0F8W	HISPASAT-2		A	5, 7
F	F2_A2733	-7.00	3	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CR		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2773	-7.00	3	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CR		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2773	-7.00	3	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3373	-7.00	3	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2773	-7.00	3	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3373	-7.00	3	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	3	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	3	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	3	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	3	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	3	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	3	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	3	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
FSM	FSM00000	146.00	3	151.67	5.42	5.34	1.51	166.52	R13TSS		35.37		MODRES	CL		58.87	27M0F8W			P	5, 7
GAB	GAB26000	-13.00	3	11.80	-0.60	1.43	1.12	64.00	R13TSS		42.40		MODRES	CR		58.30	27M0F8W			P	
GMB	GMB30200	-37.00	3	-15.10	13.40	0.79	0.60	4.00	R13TSS		47.69		MODRES	CL		58.29	27M0F8W			P	
GRC	GRC10500	5.00	3	24.70	38.20	1.78	0.98	156.00	R13TSS		42.03		MODRES	CR		58.33	27M0F8W			P	
IND	IND04300	56.00	3	77.80	11.10	1.36	1.28	172.00	R13TSS		42.04		MODRES	CR		58.34	27M0F8W			P	
IND	IND04701	68.00	3	93.30	11.10	1.92	0.60	96.00	R13TSS		43.83		MODRES	CR		58.43	27M0F8W			P	
INS	INS03600	104.00	3	135.20	-3.80	2.46	2.00	147.00	R13TSS		37.53		MODRES	CR		58.83	27M0F8W			P	
IRN	IRN10900	34.00	3	54.20	32.40	3.82	1.82	149.00	R13TSS		36.03		MODRES	CL		57.83	27M0F8W		72	P	
IRN	IRN10901	34.00	3	54.20	32.40	3.82	1.82	149.00	R13TSS		36.03		MODRES	CL		57.83	27M0F8W		72	P	
J	000BS-3N	109.85	3	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		64.20	27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	3	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		64.20	27M0F8W		33	PE	
KIR	KIR00001	176.00	3	177.16	-0.79	4.47	1.27	163.00	R13TSS		36.91		MODRES	CL		58.91	27M0F8W			P	5, 7
LBN	LBN27900	11.00	3	35.80	33.90	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.58	27M0F8W			P	
LBR	LBR24400	-33.50	3	-9.30	6.60	1.22	0.70	133.00	R13TSS		45.13		MODRES	CR		58.23	27M0F8W			P	7
LBY	LBY32100	-25.00	3	13.10	27.20	2.36	1.12	129.00	R13TSS		40.23		MODRES	CL		58.03	27M0F8W			P	
LIE	LIE25300	-37.00	3	9.50	47.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.38	27M0F8W			P	
LTU	LTU06100	23.00	3	23.79	55.66	0.70	0.60	176.00	R13TSS		48.21		MODRES	CL		58.91	27M0F8W			P	7
LUX	LUX11400	-19.00	3	6.00	49.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.88	27M0F8W			P	
NRU	NRU30900	134.00	3	167.00	-0.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		57.48	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
ROU	ROU13600	-1.00	3	25.00	45.70	1.38	0.66	155.00	R13TSS		44.85		MODRES	CL		58.75	27M0F8W			P	5, 7
SMO	SMO05700	158.00	3	-172.30	-13.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.58	27M0F8W			P	
SNG	SNG15100	74.00	3	103.80	1.30	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		58.48	27M0F8W			P	
SOM	SOM31200	23.00	3	45.00	6.40	3.26	1.54	71.00	R13TSS		37.44		MODRES	CR		57.34	27M0F8W			P	
SVK	SVK14400	17.00	3	19.65	48.69	0.82	0.60	5.20	R13TSS		47.53		MODRES	CR		58.93	27M0F8W			P	
UGA	UGA05100	11.00	3	32.30	1.20	1.46	1.12	60.00	R13TSS		42.31		MODRES	CR		58.21	27M0F8W			P	
UKR	UKR06300	38.00	3	31.74	48.22	2.29	0.96	177.78	R13TSS		41.01		MODRES	CL		58.91	27M0F8W			P	5, 7
USA	MRA33200	122.00	3	145.90	16.90	1.20	0.60	76.00	R13TSS		45.87		MODRES	CR		58.47	27M0F8W		14	P	
USA	MRA33201	122.00	3	145.90	16.90	1.20	0.60	76.00	R13TSS		45.87		MODRES	CR		58.47	27M0F8W		14	P	
UZB	UZB07100	44.00	3	64.01	41.21	2.67	0.96	163.32	R13TSS		40.37		MODRES	CL		58.87	27M0F8W			P	5, 7
VTN	VTN32500	86.00	3	108.00	14.80	3.80	1.90	126.00	R123FR		35.86		MODRES	CL		58.36	27M0F8W			P	7
VUT	VUT12800	140.00	3	168.00	-16.40	1.52	0.68	87.00	R13TSS		44.30		MODRES	CL		57.80	27M0F8W			P	
ZMB	ZMB31400	-1.00	3	27.50	-13.10	2.38	1.48	39.00	R13TSS		38.98		MODRES	CR		58.68	27M0F8W			P	
ALG	ALG25200	-25.00	4	1.60	25.50	3.64	2.16	152.00	R13TSS		35.49		MODRES	CR		57.79	27M0F8W			P	
AND	AND34100	-37.00	4	1.60	42.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.48	27M0F8W			P	
ARS	ARS00300	17.00	4	41.10	23.80	3.52	1.68	134.00	R13TSS		36.73		MODRES	CL		57.73	27M0F8W		70	P	
ARS	ARS00301	17.00	4	41.10	23.80	3.52	1.68	134.00	R13TSS		36.73		MODRES	CL		57.73	27M0F8W		70	P	
AUS	AUS00500	152.00	4	133.90	-18.40	2.82	1.74	105.00	R13TSS		37.53		MODRES	CL		59.43	27M0F8W			P	
AUT	AUT01600	-19.00	4	12.20	47.50	1.14	0.63	166.00	R13TSS		45.88		MODRES	CL		59.08	27M0F8W			P	
AZE	AZE06400	23.00	4	47.47	40.14	0.93	0.60	158.14	R13TSS		46.98		MODRES	CR		58.88	27M0F8W			P	5, 7
BUL	BUL02000	-1.00	4	25.00	43.00	1.04	0.60	165.00	R13TSS		46.50		MODRES	CR		58.60	27M0F8W			P	
CHN	CHN15600	62.00	4	97.80	36.30	2.56	1.58	157.00	R13TSS		38.38		MODRES	CR		58.48	27M0F8W			P	
CHN	CHN16100	92.00	4	118.10	31.10	2.49	1.69	117.00	R13TSS		38.21		MODRES	CR		59.41	27M0F8W			P	
EGY	EGY02600	-7.00	4	29.70	26.80	2.33	1.72	136.00	R13TSS		38.42		MODRES	CL		58.12	27M0F8W			P	
F	F2_A2744	-7.00	4	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2784	-7.00	4	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2784	-7.00	4	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3384	-7.00	4	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2784	-7.00	4	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3384	-7.00	4	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	OCE10100	-160.00	4	-145.00	-16.30	4.34	3.54	4.00	R13TSS		32.58		MODRES	CL		58.48	27M0F8W			P	
F /EUT	E2WA7DA2	29.00	4	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	4	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	4	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	4	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	4	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	4	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	4	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
G	G 02700	-33.50	4	-3.50	53.80	1.84	0.72	142.00	R13TSS		43.23		MODRES	CR		60.03	27M0F8W			P	7

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
IND	IND04001	56.00	4	73.00	25.00	1.82	1.48	58.00	R13TSS		40.14		MODRES	CL		58.64	27M0F8W			P	
IND	IND04800	68.00	4	86.20	25.00	1.56	0.90	120.00	R13TSS		42.97		MODRES	CL		58.67	27M0F8W			P	
INS	INS02800	80.20	4	101.50	0.00	3.00	1.20	133.00	R13TSS		38.88		MODRES	CL		58.28	27M0F8W			P	
KOR	KO11201D	116.00	4	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40		R13RES	CL		63.60	27M0G7W	KOREASAT-1	20	AE	
KOR	KOR11200	110.00	4	127.50	36.00	1.24	1.02	168.00	R13TSS		43.43		MODRES	CL		58.63	27M0F8W		20	P	
KOR	KOR11201	116.00	4	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40		R13RES	CL		63.60	27M0F8W	KOREASAT-1	20	AE	
LAO	LAO28400	74.00	4	103.70	18.10	2.16	0.78	133.00	R13TSS		42.18		MODRES	CR		58.78	27M0F8W			P	
MAU	MAU24300	29.00	4	56.80	-13.90	1.56	1.38	65.00	R13TSS		41.12		MODRES	CR		58.72	27M0F8W			P	
MDA	MDA06300	38.00	4	28.41	46.99	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5, 7
MLA	MLA22800	86.00	4	114.10	3.90	2.34	1.12	45.00	R13TSS		40.26		MODRES	CR		58.56	27M0F8W			P	
MLD	MLD3060A	44.00	4	73.10	6.00	0.96	0.60	90.00	R13TSS		46.84		MODRES	CR		58.74	27M0F8W			P	7
MLI	MLI32800	-37.00	4	-7.60	13.20	1.74	1.24	171.00	R13TSS		41.11		MODRES	CR		58.71	27M0F8W			P	
MLT	MLT14700	-13.00	4	14.30	35.90	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		55.98	27M0F8W			P	
MOZ	MOZ30700	-1.00	4	34.00	-18.00	3.57	1.38	55.00	R13TSS		37.52		MODRES	CL		59.22	27M0F8W			P	
NZL	CKH05300	158.00	4	-163.00	-11.20	1.76	0.72	30.00	R13TSS		43.42		MODRES	CL		59.32	27M0F8W		4	P	
NZL	CKH05301	158.00	4	-163.00	-11.20	1.76	0.72	30.00	R13TSS		43.42		MODRES	CL		59.32	27M0F8W		4	P	
PAK	PAK28300	38.00	4	74.70	33.90	1.34	1.13	160.00	R13TSS		42.65		MODRES	CR		59.35	27M0F8W		75	P	
PAK	PAK28301	38.00	4	74.70	33.90	1.34	1.13	160.00	R13TSS		42.65		MODRES	CR		59.35	27M0F8W		75	P	
PLW	PLW00000	146.00	4	132.99	5.52	1.29	0.60	55.84	R13TSS		45.55		MODRES	CR		58.85	27M0F8W			P	7
PNG	PNG27100	128.00	4	148.00	-6.70	2.80	2.05	155.00	R13TSS		36.86		MODRES	CR		58.36	27M0F8W			P	
RRW	RRW31000	11.00	4	30.00	-2.10	0.66	0.60	42.00	R13TSS		48.47		MODRES	CL		59.77	27M0F8W			P	
S	S 13800	5.00	4	16.20	61.00	1.04	0.98	14.00	R13TSS		44.36		MODRES	CL		62.06	27M0F8W		27	P	
S	SIRIUS01	5.20	4	14.00	63.00	1.30	0.70	142.00	R13TSS		42.50		R13RES	CR		59.50	27M0F8W	SIRIUS	27	AE	
STP	STP24100	-13.00	4	7.00	0.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.38	27M0F8W			P	
SVN	SVN14800	34.00	4	15.01	46.18	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5, 7
TON	TON21500	170.00	4	-174.70	-18.00	1.41	0.68	85.00	R13TSS		44.63		MODRES	CR		58.33	27M0F8W			P	
ZAI	ZAI32200	-19.00	4	22.40	0.00	2.16	1.88	48.00	R13TSS		38.36		MODRES	CR		59.66	27M0F8W			P	
AFG	AFG24600	50.00	5	64.50	33.10	1.44	1.40	21.00	R13TSS		41.40		MODRES	CR		58.40	27M0F8W			P	
AUS	AUS00900	164.00	5	147.50	-32.10	2.31	1.43	187.00	R13TSS		39.25		MODRES	CR		59.25	27M0F8W		78	P	
AUS	AUS0090A	164.00	5	159.06	-31.52	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		78	P	7
AUS	AUS0090B	164.00	5	167.93	-29.02	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		78	P	7
BLR	BLR06200	38.00	5	27.91	53.06	1.21	0.60	11.47	R13TSS		45.83		MODRES	CL		58.93	27M0F8W			P	5, 7
BTN	BTN03100	86.00	5	90.44	27.05	0.72	0.60	175.47	R13TSS		48.11		MODRES	CR		58.91	27M0F8W			P	5, 7
CHN	CHN15500	62.00	5	88.30	31.50	3.38	1.45	162.00	R13TSS		37.54		MODRES	CL		57.94	27M0F8W			P	
CHN	CHN16200	92.00	5	115.90	21.00	2.74	2.42	23.00	R13TSS		36.23		MODRES	CL		59.03	27M0F8W			P	
CHN	CHN16400	79.80	5	112.20	37.40	1.06	0.76	111.00	R13TSS		45.39		MODRES	CR		59.19	27M0F8W			P	
CHN	CHN19000	122.00	5	114.17	23.32	0.91	0.60	2.88	R13TSS		47.08		MODRES	CR		58.88	27M0F8W			P	5
CME	CME30000	-13.00	5	12.70	6.20	2.54	1.68	87.00	R13TSS		38.15		MODRES	CR		58.55	27M0F8W			P	
E	HISPASA2	-30.00	5	-8.80	35.40	3.00	1.90	45.00	R13TSS		36.90		MODRES	CL		59.00	27M0F8W	HISPASAT-2		A	5, 7

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
EST	EST06100	23.00	5	25.01	58.47	0.72	0.60	9.93	R13TSS		48.09		MODRES	CL		58.89	27M0F8W			P	5, 7
F	F 09300	-19.00	5	2.60	45.90	2.50	0.98	160.00	R13TSS		40.56		R13RES	CR		63.76	27M0F8W		19	PE	
F	F 09306	-7.00	5	2.60	45.90	2.50	0.98	160.00	R13TSS		41.00		MODRES	CR		58.90	27M0F8W	RADIOSAT	19	A	
F	F3_A2751	-7.00	5	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3351	-7.00	5	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2751	-7.00	5	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3351	-7.00	5	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	5	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	5	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	5	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	5	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	5	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	5	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	5	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
FJI	FJI19300	152.00	5	179.40	-17.90	1.04	0.98	67.00	R13TSS		44.36		MODRES	CR		58.66	27M0F8W			P	
GUI	GUI19200	-37.00	5	-11.00	10.20	1.58	1.04	147.00	R13TSS		42.29		MODRES	CL		58.49	27M0F8W			P	
HRV	HRV14800	34.00	5	16.74	44.54	0.88	0.69	5.30	R13TSS		46.57		MODRES	CL		58.87	27M0F8W			P	5, 7
IND	IND03901	56.00	5	72.70	11.20	1.26	0.60	107.00	R13TSS		45.66		MODRES	CR		58.06	27M0F8W			P	
IND	IND04400	68.00	5	79.50	22.30	2.19	1.42	146.00	R13TSS		39.52		MODRES	CR		58.42	27M0F8W			P	
INS	INS03500	104.00	5	124.30	-3.20	3.34	1.94	82.00	R13TSS		36.33		MODRES	CR		58.23	27M0F8W			P	
J	000BS-3N	109.85	5	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		64.20	27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	5	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		64.20	27M0F8W		33	PE	
LBY	LBY28000	-25.00	5	21.40	26.00	2.50	1.04	119.00	R13TSS		40.30		MODRES	CL		58.50	27M0F8W			P	
MDG	MDG23600	29.00	5	46.60	-18.80	2.72	1.14	65.00	R13TSS		39.53		MODRES	CL		58.43	27M0F8W			P	
NZL	NZL05500	158.00	5	172.30	-39.70	2.88	1.56	47.00	R13TSS		37.92		MODRES	CR		58.42	27M0F8W			P	
POL	POL13200	-1.00	5	19.30	51.80	1.46	0.64	162.00	R13TSS		44.74		MODRES	CL		59.24	27M0F8W			P	
QAT	QAT24700	17.00	5	51.10	25.30	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		56.78	27M0F8W			P	
SLM	SLM00000	146.00	5	159.32	-8.40	1.50	1.18	140.48	R13TSS		41.98		MODRES	CL		58.88	27M0F8W			P	5, 7
SMR	SMR31100	-37.00	5	12.60	43.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.48	27M0F8W			P	
SWZ	SWZ31300	-1.00	5	31.50	-26.50	0.62	0.60	66.00	R13TSS		48.74		MODRES	CR		57.84	27M0F8W			P	
THA	THA14200	74.00	5	100.70	13.20	2.82	1.54	106.00	R13TSS		38.07		MODRES	CL		58.67	27M0F8W			P	
TJK	TJK06900	44.00	5	71.14	38.37	1.25	0.76	159.15	R13TSS		44.65		MODRES	CL		58.85	27M0F8W			P	5, 7
TUR	TUR14500	5.00	5	34.40	38.90	2.68	1.04	168.00	R13TSS		40.00		MODRES	CR		58.80	27M0F8W			P	
USA	PLM33700	170.00	5	-161.40	7.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.38	27M0F8W		9	P	
USA	PLM33701	170.00	5	-161.40	7.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.38	27M0F8W		9	P	
USA	SMA33500	170.00	5	-170.10	-14.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.18	27M0F8W		13	P	
USA	SMA33501	170.00	5	-170.10	-14.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.18	27M0F8W		13	P	
USA	WAK33400	140.00	5	166.50	19.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.58	27M0F8W		11	P	
USA	WAK33401	140.00	5	166.50	19.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.58	27M0F8W		11	P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
YEM	YEM26700	11.00	5	48.61	14.42	1.68	1.44	157.35	R13TSS		40.61		MODRES	CL		58.91	27M0F8W			P	7
	YYY00001	11.00	5	34.99	31.86	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	3, 5, 7
ALG	ALG25100	-25.00	6	4.20	33.20	2.45	1.25	172.00	R13TSS		39.59		MODRES	CR		58.39	27M0F8W			P	
ARS	ARS27500	17.00	6	48.30	24.60	3.84	1.20	138.00	R13TSS		37.81		MODRES	CL		57.81	27M0F8W			P	
AUS	AUS00600	152.00	6	136.60	-30.90	2.41	1.52	161.00	R13TSS		38.80		MODRES	CL		58.40	27M0F8W			P	
AUS	AUS00800	164.00	6	145.90	-21.70	3.62	1.63	136.00	R13TSS		36.73		MODRES	CL		58.83	27M0F8W			P	
BIH	BIH14800	34.00	6	17.77	44.32	0.62	0.60	166.84	R13TSS		48.71		MODRES	CR		58.91	27M0F8W			P	5, 7
BOT	BOT29700	-1.00	6	23.30	-22.20	2.13	1.50	36.00	R13TSS		39.40		MODRES	CL		58.80	27M0F8W			P	
CHN	CHN15400	62.00	6	83.90	40.50	2.75	2.05	177.00	R13TSS		36.94		MODRES	CR		58.34	27M0F8W			P	
CHN	CHN16100	92.00	6	118.10	31.10	2.49	1.69	117.00	R13TSS		38.21		MODRES	CR		59.51	27M0F8W			P	
CLN	CLN21900	50.00	6	80.60	7.70	1.18	0.60	106.00	R13TSS		45.95		MODRES	CR		58.65	27M0F8W			P	
D	D 08700	-19.00	6	9.60	49.90	1.62	0.72	147.00	R13TSS		43.78		MODRES	CL		60.58	27M0F8W			P	7
F	F2_A2722	-7.00	6	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2722	-7.00	6	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2762	-7.00	6	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2722	-7.00	6	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A2762	-7.00	6	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3322	-7.00	6	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_A3362	-7.00	6	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2722	-7.00	6	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D2762	-7.00	6	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3322	-7.00	6	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	F3_D3362	-7.00	6	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	NCL10000	140.00	6	166.00	-21.00	1.14	0.72	146.00	R13TSS		45.30		MODRES	CR		58.80	27M0F8W		6	P	
F	NCL10001	140.00	6	166.00	-21.00	1.14	0.72	146.00	R13TSS		45.30		MODRES	CR		58.80	27M0F8W		6	P	
F	WAL10200	140.00	6	-176.80	-14.00	0.74	0.60	29.00	R13TSS		47.97		MODRES	CR		59.37	27M0F8W		8	P	
F	WAL10201	140.00	6	-176.80	-14.00	0.74	0.60	29.00	R13TSS		47.97		MODRES	CR		59.37	27M0F8W		8	P	
F /EUT	E2WA7DA2	29.00	6	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	6	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	6	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	6	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	6	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	6	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	6	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
FIN	FIN10300	5.00	6	22.50	64.50	1.38	0.76	171.00	R13TSS		44.24		MODRES	CL		62.84	27M0F8W			P	
GNB	GNB30400	-30.00	6	-15.00	12.00	0.90	0.60	172.00	R13TSS		47.12		MODRES	CL		58.22	27M0F8W			P	7
IND	IND03701	68.00	6	93.00	25.50	1.46	1.13	40.00	R13TSS		42.27		MODRES	CL		58.97	27M0F8W			P	
IND	IND04500	56.00	6	76.20	19.50	1.58	1.58	21.00	R13TSS		40.47		MODRES	CL		58.57	27M0F8W			P	
INS	INS02800	80.20	6	101.50	0.00	3.00	1.20	133.00	R13TSS		38.88		MODRES	CL		58.28	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
IRL	IRL21100	-33.50	6	-8.20	53.20	0.84	0.60	162.00	R13TSS		47.42		MODRES	CR		59.32	27M0F8W			P	7
KOR	KO11201D	116.00	6	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40		R13RES	CL		63.60	27M0G7W	KOREASAT-1	20	AE	
KOR	KOR11200	110.00	6	127.50	36.00	1.24	1.02	168.00	R13TSS		43.43		MODRES	CL		58.63	27M0F8W		20	P	
KOR	KOR11201	116.00	6	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40		R13RES	CL		63.60	27M0F8W	KOREASAT-1	20	AE	
LAO	LAO28400	74.00	6	103.70	18.10	2.16	0.78	133.00	R13TSS		42.18		MODRES	CR		58.78	27M0F8W			P	
MAU	MAU24200	29.00	6	59.80	-18.90	1.62	1.24	55.00	R13TSS		41.42		MODRES	CR		59.02	27M0F8W			P	
MHL	MHL00000	146.00	6	167.64	9.83	2.07	0.90	157.42	R13TSS		41.75		MODRES	CR		58.95	27M0F8W			P	7
MKD	MKD14800	23.00	6	21.61	41.56	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5, 7
MLA	MLA22800	86.00	6	114.10	3.90	2.34	1.12	45.00	R13TSS		40.26		MODRES	CR		58.56	27M0F8W			P	
MLI	MLI32700	-37.00	6	-2.00	19.00	2.66	1.26	127.00	R13TSS		39.19		MODRES	CR		58.19	27M0F8W			P	
NOR	BIFROS22	-0.80	6	17.00	61.50					NO9	32.00	6.00	MODRES	CR		54.50	27M0FXF	BIFROST-2		A	
NZL	CKH05200	158.00	6	-161.00	-19.80	1.02	0.64	132.00	R13TSS		46.30		MODRES	CL		59.60	27M0F8W		3	P	
NZL	CKH05201	158.00	6	-161.00	-19.80	1.02	0.64	132.00	R13TSS		46.30		MODRES	CL		59.60	27M0F8W		3	P	
PAK	PAK12700	38.00	6	69.60	29.50	2.30	2.16	14.00	R13TSS		37.49		MODRES	CR		58.99	27M0F8W		73	P	
PAK	PAK12701	38.00	6	69.60	29.50	2.30	2.16	14.00	R13TSS		37.49		MODRES	CR		58.99	27M0F8W		73	P	
PNG	PNG13100	110.00	6	147.70	-6.30	2.50	2.18	169.00	R13TSS		37.08		MODRES	CR		59.38	27M0F8W			P	
TCD	TCD14300	-13.00	6	18.10	15.50	3.40	1.72	107.00	R13TSS		36.78		MODRES	CL		58.98	27M0F8W			P	
TGO	TGO22600	-25.00	6	0.80	8.60	1.52	0.60	105.00	R13TSS		44.85		MODRES	CL		58.45	27M0F8W			P	
TUV	TUV00000	176.00	6	177.61	-7.11	0.94	0.60	137.58	R13TSS		46.93		MODRES	CR		58.93	27M0F8W			P	7
USA	GUM33100	122.00	6	144.50	13.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		58.38	27M0F8W		15	P	
USA	GUM33101	122.00	6	144.50	13.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		58.38	27M0F8W		15	P	
YEM	YEM26600	11.00	6	44.00	15.67	0.80	0.60	114.88	R13TSS		47.66		MODRES	CR		58.86	27M0F8W			P	7
ZAI	ZAI32300	-19.00	6	21.30	-6.80	2.80	1.52	149.00	R13TSS		38.16		MODRES	CR		59.66	27M0F8W			P	
AFG	AFG24500	50.00	7	70.20	35.50	1.32	1.13	53.00	R13TSS		42.71		MODRES	CR		57.91	27M0F8W			P	
AUS	AUS00400	152.00	7	123.00	-24.20	3.06	2.17	102.00	R13TSS		36.22		MODRES	CR		58.22	27M0F8W		76	P	
AUS	AUS0040A	152.00	7	96.83	-12.19	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	7
AUS	AUS0040B	152.00	7	105.69	-10.45	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	7
AUS	AUS0040C	152.00	7	110.52	-66.28	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	7
AUS	AUS00700	164.00	7	145.20	-38.10	2.12	1.02	147.00	R13TSS		41.09		MODRES	CR		58.49	27M0F8W		77	P	
AUS	AUS0070A	164.00	7	158.94	-54.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		77	P	7
BEN	BEN23300	-19.00	7	2.20	9.50	1.44	0.68	97.00	R13TSS		44.54		MODRES	CL		58.34	27M0F8W			P	
CHN	CHN15700	62.00	7	102.30	27.80	2.56	1.58	127.00	R13TSS		38.38		MODRES	CL		60.08	27M0F8W			P	
CHN	CHN16000	92.00	7	122.80	45.30	2.50	1.45	150.00	R13TSS		38.85		MODRES	CL		60.05	27M0F8W			P	
COM	COM20700	29.00	7	44.10	-12.10	0.76	0.60	149.00	R13TSS		47.86		MODRES	CL		58.06	27M0F8W			P	
E	HISPASA2	-30.00	7	-8.80	35.40	3.00	1.90	45.00	R13TSS		36.90		MODRES	CL		59.00	27M0F8W	HISPASAT-2		A	5, 7
F	F2_A2733	-7.00	7	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CR		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2773	-7.00	7	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CR		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2773	-7.00	7	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3373	-7.00	7	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0F9W	RADIOSAT-3	19	A	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F	F3_D2773	-7.00	7	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3373	-7.00	7	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	7	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	7	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	7	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	7	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	7	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	7	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	7	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
FSM	FSM00000	146.00	7	151.67	5.42	5.34	1.51	166.52	R13TSS		35.37		MODRES	CL		58.87	27M0F8W			P	5, 7
GAB	GAB26000	-13.00	7	11.80	-0.60	1.43	1.12	64.00	R13TSS		42.40		MODRES	CR		58.40	27M0F8W			P	
GMB	GMB30200	-37.00	7	-15.10	13.40	0.79	0.60	4.00	R13TSS		47.69		MODRES	CL		58.39	27M0F8W			P	
GRC	GRC10500	5.00	7	24.70	38.20	1.78	0.98	156.00	R13TSS		42.03		MODRES	CR		58.43	27M0F8W			P	
IND	IND04301	56.00	7	77.80	11.10	1.36	1.28	172.00	R13TSS		42.04		MODRES	CR		58.44	27M0F8W			P	
IND	IND04700	68.00	7	93.30	11.10	1.92	0.60	96.00	R13TSS		43.83		MODRES	CR		58.53	27M0F8W			P	
INS	INS03600	104.00	7	135.20	-3.80	2.46	2.00	147.00	R13TSS		37.53		MODRES	CR		58.83	27M0F8W			P	
IRN	IRN10900	34.00	7	54.20	32.40	3.82	1.82	149.00	R13TSS		36.03		MODRES	CL		57.83	27M0F8W		72	P	
IRN	IRN10901	34.00	7	54.20	32.40	3.82	1.82	149.00	R13TSS		36.03		MODRES	CL		57.83	27M0F8W		72	P	
J	000BS-3N	109.85	7	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		64.20	27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	7	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		64.20	27M0F8W		33	PE	
KIR	KIR00001	176.00	7	177.16	-0.79	4.47	1.27	163.00	R13TSS		36.91		MODRES	CL		58.91	27M0F8W			P	5, 7
LBN	LBN27900	11.00	7	35.80	33.90	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.68	27M0F8W			P	
LBR	LBR24400	-33.50	7	-9.30	6.60	1.22	0.70	133.00	R13TSS		45.13		MODRES	CR		58.33	27M0F8W			P	7
LBY	LBY32100	-25.00	7	13.10	27.20	2.36	1.12	129.00	R13TSS		40.23		MODRES	CL		58.13	27M0F8W			P	
LIE	LIE25300	-37.00	7	9.50	47.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.48	27M0F8W			P	
LTU	LTU06100	23.00	7	23.79	55.66	0.70	0.60	176.00	R13TSS		48.21		MODRES	CL		58.91	27M0F8W			P	7
LUX	LUX11400	-19.00	7	6.00	49.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.98	27M0F8W			P	
NRU	NRU30900	134.00	7	167.00	-0.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		57.58	27M0F8W			P	
ROU	ROU13600	-1.00	7	25.00	45.70	1.38	0.66	155.00	R13TSS		44.85		MODRES	CL		58.85	27M0F8W			P	5, 7
SMO	SMO05700	158.00	7	-172.30	-13.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.68	27M0F8W			P	
SNG	SNG15100	74.00	7	103.80	1.30	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		58.58	27M0F8W			P	
SOM	SOM31200	23.00	7	45.00	6.40	3.26	1.54	71.00	R13TSS		37.44		MODRES	CR		57.44	27M0F8W			P	
SVK	SVK14400	17.00	7	19.65	48.69	0.82	0.60	5.20	R13TSS		47.53		MODRES	CR		58.93	27M0F8W			P	
UGA	UGA05100	11.00	7	32.30	1.20	1.46	1.12	60.00	R13TSS		42.31		MODRES	CR		58.31	27M0F8W			P	
UKR	UKR06300	38.00	7	31.74	48.22	2.29	0.96	177.78	R13TSS		41.01		MODRES	CL		58.91	27M0F8W			P	5, 7
USA	MRA33200	122.00	7	145.90	16.90	1.20	0.60	76.00	R13TSS		45.87		MODRES	CR		58.47	27M0F8W		14	P	
USA	MRA33201	122.00	7	145.90	16.90	1.20	0.60	76.00	R13TSS		45.87		MODRES	CR		58.47	27M0F8W		14	P	
UZB	UZB07100	44.00	7	64.01	41.21	2.67	0.96	163.32	R13TSS		40.37		MODRES	CL		58.87	27M0F8W			P	5, 7
VTN	VTN32500	86.00	7	108.00	14.80	3.80	1.90	126.00	R123FR		35.86		MODRES	CL		58.36	27M0F8W			P	7

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
VUT	VUT12800	140.00	7	168.00	-16.40	1.52	0.68	87.00	R13TSS		44.30		MODRES	CL		57.90	27M0F8W			P	
ZMB	ZMB31400	-1.00	7	27.50	-13.10	2.38	1.48	39.00	R13TSS		38.98		MODRES	CR		58.78	27M0F8W			P	
ALG	ALG25200	-25.00	8	1.60	25.50	3.64	2.16	152.00	R13TSS		35.49		MODRES	CR		57.79	27M0F8W			P	
AND	AND34100	-37.00	8	1.60	42.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.48	27M0F8W			P	
ARS	ARS00300	17.00	8	41.10	23.80	3.52	1.68	134.00	R13TSS		36.73		MODRES	CL		57.83	27M0F8W		70	P	
AUS	AUS00500	152.00	8	133.90	-18.40	2.82	1.74	105.00	R13TSS		37.53		MODRES	CL		59.43	27M0F8W			P	
AUT	AUT01600	-19.00	8	12.20	47.50	1.14	0.63	166.00	R13TSS		45.88		MODRES	CL		59.18	27M0F8W			P	
AZE	AZE06400	23.00	8	47.47	40.14	0.93	0.60	158.14	R13TSS		46.98		MODRES	CR		58.88	27M0F8W			P	5, 7
BUL	BUL02000	-1.00	8	25.00	43.00	1.04	0.60	165.00	R13TSS		46.50		MODRES	CR		58.70	27M0F8W			P	
CHN	CHN15600	62.00	8	97.80	36.30	2.56	1.58	157.00	R13TSS		38.38		MODRES	CR		58.48	27M0F8W			P	
CHN	CHN17300	92.00	8	115.70	27.40	1.14	0.94	99.00	R13TSS		44.15		MODRES	CR		59.05	27M0F8W			P	
EGY	EGY02600	-7.00	8	29.70	26.80	2.33	1.72	136.00	R13TSS		38.42		MODRES	CL		58.22	27M0F8W			P	
F	F2_A2744	-7.00	8	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2784	-7.00	8	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2784	-7.00	8	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3384	-7.00	8	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2784	-7.00	8	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3384	-7.00	8	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	OCE10100	-160.00	8	-145.00	-16.30	4.34	3.54	4.00	R13TSS		32.58		MODRES	CL		58.58	27M0F8W			P	
F /EUT	E2WA7DA2	29.00	8	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	8	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	8	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	8	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	8	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	8	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	8	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
G	G 02700	-33.50	8	-3.50	53.80	1.84	0.72	142.00	R13TSS		43.23		MODRES	CR		60.13	27M0F8W			P	7
IND	IND04000	56.00	8	73.00	25.00	1.82	1.48	58.00	R13TSS		40.14		MODRES	CL		58.74	27M0F8W			P	
IND	IND04801	68.00	8	86.20	25.00	1.56	0.90	120.00	R13TSS		42.97		MODRES	CL		58.67	27M0F8W			P	
INS	INS02800	80.20	8	101.50	0.00	3.00	1.20	133.00	R13TSS		38.88		MODRES	CL		58.38	27M0F8W			P	
KOR	KO11201D	116.00	8	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40		R13RES	CL		63.70	27M0G7W	KOREASAT-1	20	AE	
KOR	KOR11200	110.00	8	127.50	36.00	1.24	1.02	168.00	R13TSS		43.43		MODRES	CL		58.73	27M0F8W		20	P	
KOR	KOR11201	116.00	8	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40		R13RES	CL		63.70	27M0F8W	KOREASAT-1	20	AE	
LAO	LAO28400	74.00	8	103.70	18.10	2.16	0.78	133.00	R13TSS		42.18		MODRES	CR		58.78	27M0F8W			P	
MAU	MAU24300	29.00	8	56.80	-13.90	1.56	1.38	65.00	R13TSS		41.12		MODRES	CR		58.82	27M0F8W			P	
MDA	MDA06300	38.00	8	28.41	46.99	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5, 7
MLA	MLA22800	86.00	8	114.10	3.90	2.34	1.12	45.00	R13TSS		40.26		MODRES	CR		58.66	27M0F8W			P	
MLD	MLD3060A	44.00	8	73.10	6.00	0.96	0.60	90.00	R13TSS		46.84		MODRES	CR		58.74	27M0F8W			P	7
MLI	MLI32800	-37.00	8	-7.60	13.20	1.74	1.24	171.00	R13TSS		41.11		MODRES	CR		58.81	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
MLT	MLT14700	-13.00	8	14.30	35.90	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		55.98	27M0F8W			P	
MOZ	MOZ30700	-1.00	8	34.00	-18.00	3.57	1.38	55.00	R13TSS		37.52		MODRES	CL		59.22	27M0F8W			P	
NZL	CKH05300	158.00	8	-163.00	-11.20	1.76	0.72	30.00	R13TSS		43.42		MODRES	CL		59.32	27M0F8W		4	P	
NZL	CKH05301	158.00	8	-163.00	-11.20	1.76	0.72	30.00	R13TSS		43.42		MODRES	CL		59.32	27M0F8W		4	P	
PAK	PAK28300	38.00	8	74.70	33.90	1.34	1.13	160.00	R13TSS		42.65		MODRES	CR		59.35	27M0F8W		75	P	
PAK	PAK28301	38.00	8	74.70	33.90	1.34	1.13	160.00	R13TSS		42.65		MODRES	CR		59.35	27M0F8W		75	P	
PLW	PLW00000	146.00	8	132.99	5.52	1.29	0.60	55.84	R13TSS		45.55		MODRES	CR		58.85	27M0F8W			P	7
PNG	PNG27100	128.00	8	148.00	-6.70	2.80	2.05	155.00	R13TSS		36.86		MODRES	CR		58.36	27M0F8W			P	
RRW	RRW31000	11.00	8	30.00	-2.10	0.66	0.60	42.00	R13TSS		48.47		MODRES	CL		59.87	27M0F8W			P	
S	S 13800	5.00	8	16.20	61.00	1.04	0.98	14.00	R13TSS		44.36		MODRES	CL		62.06	27M0F8W		27	P	
S	SIRIUS01	5.20	8	14.00	63.00	1.30	0.70	142.00	R13TSS		42.50		R13RES	CR		59.50	27M0F8W	SIRIUS	27	AE	
STP	STP24100	-13.00	8	7.00	0.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.48	27M0F8W			P	
SVN	SVN14800	34.00	8	15.01	46.18	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5, 7
TON	TON21500	170.00	8	-174.70	-18.00	1.41	0.68	85.00	R13TSS		44.63		MODRES	CR		58.33	27M0F8W			P	
ZAI	ZAI32200	-19.00	8	22.40	0.00	2.16	1.88	48.00	R13TSS		38.36		MODRES	CR		59.76	27M0F8W			P	
AFG	AFG24600	50.00	9	64.50	33.10	1.44	1.40	21.00	R13TSS		41.40		MODRES	CR		58.40	27M0F8W			P	
AUS	AUS00900	164.00	9	147.50	-32.10	2.31	1.43	187.00	R13TSS		39.25		MODRES	CR		59.25	27M0F8W		78	P	
AUS	AUS0090A	164.00	9	159.06	-31.52	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		78	P	7
AUS	AUS0090B	164.00	9	167.93	-29.02	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		78	P	7
BLR	BLR06200	38.00	9	27.91	53.06	1.21	0.60	11.47	R13TSS		45.83		MODRES	CL		58.93	27M0F8W			P	5, 7
BTN	BTN03100	86.00	9	90.44	27.05	0.72	0.60	175.47	R13TSS		48.11		MODRES	CR		58.91	27M0F8W			P	5, 7
CHN	CHN15500	62.00	9	88.30	31.50	3.38	1.45	162.00	R13TSS		37.54		MODRES	CL		58.04	27M0F8W			P	
CHN	CHN16200	92.00	9	115.90	21.00	2.74	2.42	23.00	R13TSS		36.23		MODRES	CL		59.03	27M0F8W			P	
CHN	CHN16500	79.80	9	111.40	41.80	1.58	1.20	15.00	R13TSS		41.67		MODRES	CR		58.57	27M0F8W			P	
CHN	CHN19000	122.00	9	114.17	23.32	0.91	0.60	2.88	R13TSS		47.08		MODRES	CR		58.88	27M0F8W			P	5
CME	CME30000	-13.00	9	12.70	6.20	2.54	1.68	87.00	R13TSS		38.15		MODRES	CR		58.55	27M0F8W			P	
E	HISPASA2	-30.00	9	-8.80	35.40	3.00	1.90	45.00	R13TSS		36.90		MODRES	CL		59.00	27M0F8W	HISPASAT-2		A	5, 7
EST	EST06100	23.00	9	25.01	58.47	0.72	0.60	9.93	R13TSS		48.09		MODRES	CL		58.89	27M0F8W			P	5, 7
F	F 09300	-19.00	9	2.60	45.90	2.50	0.98	160.00	R13TSS		40.56		R13RES	CR		63.86	27M0F8W		19	PE	
F	F 09306	-7.00	9	2.60	45.90	2.50	0.98	160.00	R13TSS		41.00		MODRES	CR		58.90	27M0F8W	RADIOSAT	19	A	
F	F3_A2751	-7.00	9	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3351	-7.00	9	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2751	-7.00	9	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3351	-7.00	9	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	9	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	9	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	9	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	9	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	9	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F /EUT	E2WA7DF1	29.00	9	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	9	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
FJI	FJI19300	152.00	9	179.40	-17.90	1.04	0.98	67.00	R13TSS		44.36		MODRES	CR		58.76	27M0F8W			P	
GUI	GUI19200	-37.00	9	-11.00	10.20	1.58	1.04	147.00	R13TSS		42.29		MODRES	CL		58.49	27M0F8W			P	
HRV	HRV14800	34.00	9	16.74	44.54	0.88	0.69	5.30	R13TSS		46.57		MODRES	CL		58.87	27M0F8W			P	5, 7
IND	IND03900	56.00	9	72.70	11.20	1.26	0.60	107.00	R13TSS		45.66		MODRES	CR		58.16	27M0F8W			P	
IND	IND04401	68.00	9	79.50	22.30	2.19	1.42	146.00	R13TSS		39.52		MODRES	CR		58.52	27M0F8W			P	
INS	INS03500	104.00	9	124.30	-3.20	3.34	1.94	82.00	R13TSS		36.33		MODRES	CR		58.33	27M0F8W			P	
J	000BS-3N	109.85	9	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		64.30	27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	9	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		64.30	27M0F8W		33	PE	
LBY	LBY28000	-25.00	9	21.40	26.00	2.50	1.04	119.00	R13TSS		40.30		MODRES	CL		58.60	27M0F8W			P	
MDG	MDG23600	29.00	9	46.60	-18.80	2.72	1.14	65.00	R13TSS		39.53		MODRES	CL		58.43	27M0F8W			P	
NZL	NZL05500	158.00	9	172.30	-39.70	2.88	1.56	47.00	R13TSS		37.92		MODRES	CR		58.42	27M0F8W			P	
POL	POL13200	-1.00	9	19.30	51.80	1.46	0.64	162.00	R13TSS		44.74		MODRES	CL		59.24	27M0F8W			P	
QAT	QAT24700	17.00	9	51.10	25.30	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		56.88	27M0F8W			P	
SLM	SLM00000	146.00	9	159.32	-8.40	1.50	1.18	140.48	R13TSS		41.98		MODRES	CL		58.88	27M0F8W			P	5, 7
SMR	SMR31100	-37.00	9	12.60	43.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.48	27M0F8W			P	
SWZ	SWZ31300	-1.00	9	31.50	-26.50	0.62	0.60	66.00	R13TSS		48.74		MODRES	CR		57.94	27M0F8W			P	
THA	THA14200	74.00	9	100.70	13.20	2.82	1.54	106.00	R13TSS		38.07		MODRES	CL		58.67	27M0F8W			P	
TJK	TJK06900	44.00	9	71.14	38.37	1.25	0.76	159.15	R13TSS		44.65		MODRES	CL		58.85	27M0F8W			P	5, 7
TUR	TUR14500	5.00	9	34.40	38.90	2.68	1.04	168.00	R13TSS		40.00		MODRES	CR		58.80	27M0F8W			P	
USA	PLM33700	170.00	9	-161.40	7.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.48	27M0F8W		9	P	
USA	PLM33701	170.00	9	-161.40	7.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.48	27M0F8W		9	P	
USA	SMA33500	170.00	9	-170.10	-14.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.28	27M0F8W		13	P	
USA	SMA33501	170.00	9	-170.10	-14.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.28	27M0F8W		13	P	
USA	WAK33400	140.00	9	166.50	19.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.68	27M0F8W		11	P	
USA	WAK33401	140.00	9	166.50	19.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.68	27M0F8W		11	P	
YEM	YEM26700	11.00	9	48.61	14.42	1.68	1.44	157.35	R13TSS		40.61		MODRES	CL		58.91	27M0F8W			P	7
	YYY00001	11.00	9	34.99	31.86	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	3, 5, 7
ALG	ALG25100	-25.00	10	4.20	33.20	2.45	1.25	172.00	R13TSS		39.59		MODRES	CR		58.49	27M0F8W			P	
ARS	ARS27500	17.00	10	48.30	24.60	3.84	1.20	138.00	R13TSS		37.81		MODRES	CL		57.91	27M0F8W			P	
AUS	AUS00600	152.00	10	136.60	-30.90	2.41	1.52	161.00	R13TSS		38.80		MODRES	CL		58.40	27M0F8W			P	
AUS	AUS00800	164.00	10	145.90	-21.70	3.62	1.63	136.00	R13TSS		36.73		MODRES	CL		58.83	27M0F8W			P	
BIH	BIH14800	34.00	10	17.77	44.32	0.62	0.60	166.84	R13TSS		48.71		MODRES	CR		58.91	27M0F8W			P	5, 7
BOT	BOT29700	-1.00	10	23.30	-22.20	2.13	1.50	36.00	R13TSS		39.40		MODRES	CL		58.90	27M0F8W			P	
CHN	CHN15400	62.00	10	83.90	40.50	2.75	2.05	177.00	R13TSS		36.94		MODRES	CR		58.34	27M0F8W			P	
CHN	CHN17100	92.00	10	117.20	32.00	1.20	0.74	126.00	R13TSS		44.96		MODRES	CR		59.16	27M0F8W			P	
CHN	CHN18700	79.80	10	106.60	26.70	1.14	0.94	179.00	R13TSS		44.15		MODRES	CL		59.05	27M0F8W			P	
CLN	CLN21900	50.00	10	80.60	7.70	1.18	0.60	106.00	R13TSS		45.95		MODRES	CR		58.75	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
D	D 08700	-19.00	10	9.60	49.90	1.62	0.72	147.00	R13TSS		43.78		MODRES	CL		60.58	27M0F8W			P	7
F	F2_A2722	-7.00	10	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2722	-7.00	10	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2762	-7.00	10	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2722	-7.00	10	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A2762	-7.00	10	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3322	-7.00	10	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_A3362	-7.00	10	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2722	-7.00	10	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D2762	-7.00	10	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3322	-7.00	10	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	F3_D3362	-7.00	10	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	NCL10000	140.00	10	166.00	-21.00	1.14	0.72	146.00	R13TSS		45.30		MODRES	CR		58.80	27M0F8W		6	P	
F	NCL10001	140.00	10	166.00	-21.00	1.14	0.72	146.00	R13TSS		45.30		MODRES	CR		58.80	27M0F8W		6	P	
F	WAL10200	140.00	10	-176.80	-14.00	0.74	0.60	29.00	R13TSS		47.97		MODRES	CR		59.47	27M0F8W		8	P	
F	WAL10201	140.00	10	-176.80	-14.00	0.74	0.60	29.00	R13TSS		47.97		MODRES	CR		59.47	27M0F8W		8	P	
F /EUT	E2WA7DA2	29.00	10	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	10	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	10	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	10	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	10	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	10	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	10	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
FIN	FIN10300	5.00	10	22.50	64.50	1.38	0.76	171.00	R13TSS		44.24		MODRES	CL		62.94	27M0F8W			P	
GNB	GNB30400	-30.00	10	-15.00	12.00	0.90	0.60	172.00	R13TSS		47.12		MODRES	CL		58.22	27M0F8W			P	7
IND	IND03700	68.00	10	93.00	25.50	1.46	1.13	40.00	R13TSS		42.27		MODRES	CL		58.97	27M0F8W			P	
IND	IND04501	56.00	10	76.20	19.50	1.58	1.58	21.00	R13TSS		40.47		MODRES	CL		58.57	27M0F8W			P	
IRL	IRL21100	-33.50	10	-8.20	53.20	0.84	0.60	162.00	R13TSS		47.42		MODRES	CR		59.42	27M0F8W			P	7
KOR	KO11201D	116.00	10	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40		R13RES	CL		63.70	27M0G7W	KOREASAT-1	20	AE	
KOR	KOR11200	110.00	10	127.50	36.00	1.24	1.02	168.00	R13TSS		43.43		MODRES	CL		58.73	27M0F8W		20	P	
KOR	KOR11201	116.00	10	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40		R13RES	CL		63.70	27M0F8W	KOREASAT-1	20	AE	
LAO	LAO28400	74.00	10	103.70	18.10	2.16	0.78	133.00	R13TSS		42.18		MODRES	CR		58.88	27M0F8W			P	
MAU	MAU24200	29.00	10	59.80	-18.90	1.62	1.24	55.00	R13TSS		41.42		MODRES	CR		59.12	27M0F8W			P	
MHL	MHL00000	146.00	10	167.64	9.83	2.07	0.90	157.42	R13TSS		41.75		MODRES	CR		58.95	27M0F8W			P	7
MKD	MKD14800	23.00	10	21.61	41.56	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5, 7
MLA	MLA2280A	86.00	10	114.10	3.90	2.34	1.12	45.00	R13TSS		40.26		MODRES	CR		58.66	27M0F8W			P	5, 7
MLI	MLI32700	-37.00	10	-2.00	19.00	2.66	1.26	127.00	R13TSS		39.19		MODRES	CR		58.19	27M0F8W			P	
NOR	BIFROS22	-0.80	10	17.00	61.50					NO9	32.00	6.00	MODRES	CR		54.50	27M0FXF	BIFROST-2		A	
NZL	CKH05200	158.00	10	-161.00	-19.80	1.02	0.64	132.00	R13TSS		46.30		MODRES	CL		59.70	27M0F8W		3	P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
NZL	CKH05201	158.00	10	-161.00	-19.80	1.02	0.64	132.00	R13TSS		46.30		MODRES	CL		59.70	27M0F8W		3	P	
PAK	PAK12700	38.00	10	69.60	29.50	2.30	2.16	14.00	R13TSS		37.49		MODRES	CR		58.99	27M0F8W		73	P	
PNG	PNG13100	110.00	10	147.70	-6.30	2.50	2.18	169.00	R13TSS		37.08		MODRES	CR		59.48	27M0F8W			P	
TCD	TCD14300	-13.00	10	18.10	15.50	3.40	1.72	107.00	R13TSS		36.78		MODRES	CL		59.08	27M0F8W			P	
TGO	TGO22600	-25.00	10	0.80	8.60	1.52	0.60	105.00	R13TSS		44.85		MODRES	CL		58.55	27M0F8W			P	
TUV	TUV00000	176.00	10	177.61	-7.11	0.94	0.60	137.58	R13TSS		46.93		MODRES	CR		58.93	27M0F8W			P	7
USA	GUM33100	122.00	10	144.50	13.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		58.38	27M0F8W		15	P	
USA	GUM33101	122.00	10	144.50	13.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		58.38	27M0F8W		15	P	
YEM	YEM26600	11.00	10	44.00	15.67	0.80	0.60	114.88	R13TSS		47.66		MODRES	CR		58.86	27M0F8W			P	7
ZAI	ZAI32300	-19.00	10	21.30	-6.80	2.80	1.52	149.00	R13TSS		38.16		MODRES	CR		59.66	27M0F8W			P	
AFG	AFG24500	50.00	11	70.20	35.50	1.32	1.13	53.00	R13TSS		42.71		MODRES	CR		57.91	27M0F8W			P	
AUS	AUS00400	152.00	11	123.00	-24.20	3.06	2.17	102.00	R13TSS		36.22		MODRES	CR		58.22	27M0F8W		76	P	
AUS	AUS0040A	152.00	11	96.83	-12.19	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	7
AUS	AUS0040B	152.00	11	105.69	-10.45	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	7
AUS	AUS0040C	152.00	11	110.52	-66.28	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	7
AUS	AUS00700	164.00	11	145.20	-38.10	2.12	1.02	147.00	R13TSS		41.09		MODRES	CR		58.49	27M0F8W		77	P	
AUS	AUS0070A	164.00	11	158.94	-54.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		77	P	7
BEN	BEN23300	-19.00	11	2.20	9.50	1.44	0.68	97.00	R13TSS		44.54		MODRES	CL		58.44	27M0F8W			P	
CHN	CHN15700	62.00	11	102.30	27.80	2.56	1.58	127.00	R13TSS		38.38		MODRES	CL		60.18	27M0F8W			P	
CHN	CHN16000	92.00	11	122.80	45.30	2.50	1.45	150.00	R13TSS		38.85		MODRES	CL		60.15	27M0F8W			P	
COM	COM20700	29.00	11	44.10	-12.10	0.76	0.60	149.00	R13TSS		47.86		MODRES	CL		58.16	27M0F8W			P	
E	HISPASA2	-30.00	11	-8.80	35.40	3.00	1.90	45.00	R13TSS		36.90		MODRES	CL		59.00	27M0F8W	HISPASAT-2		A	5, 7
F	F2_A2733	-7.00	11	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CR		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2773	-7.00	11	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CR		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2773	-7.00	11	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3373	-7.00	11	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2773	-7.00	11	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3373	-7.00	11	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	11	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	11	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	11	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	11	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	11	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	11	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	11	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
FSM	FSM00000	146.00	11	151.67	5.42	5.34	1.51	166.52	R13TSS		35.37		MODRES	CL		58.87	27M0F8W			P	5, 7
GAB	GAB26000	-13.00	11	11.80	-0.60	1.43	1.12	64.00	R13TSS		42.40		MODRES	CR		58.40	27M0F8W			P	
GMB	GMB30200	-37.00	11	-15.10	13.40	0.79	0.60	4.00	R13TSS		47.69		MODRES	CL		58.39	27M0F8W			P	
GRC	GRC10500	5.00	11	24.70	38.20	1.78	0.98	156.00	R13TSS		42.03		MODRES	CR		58.43	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
IND	IND04300	56.00	11	77.80	11.10	1.36	1.28	172.00	R13TSS		42.04		MODRES	CR		58.54	27M0F8W			P	
IND	IND04701	68.00	11	93.30	11.10	1.92	0.60	96.00	R13TSS		43.83		MODRES	CR		58.53	27M0F8W			P	
INS	INS03600	104.00	11	135.20	-3.80	2.46	2.00	147.00	R13TSS		37.53		MODRES	CR		58.93	27M0F8W			P	
IRN	IRN10900	34.00	11	54.20	32.40	3.82	1.82	149.00	R13TSS		36.03		MODRES	CL		57.93	27M0F8W		72	P	
IRN	IRN10901	34.00	11	54.20	32.40	3.82	1.82	149.00	R13TSS		36.03		MODRES	CL		57.93	27M0F8W		72	P	
J	000BS-3N	109.85	11	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		64.30	27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	11	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		64.30	27M0F8W		33	PE	
KIR	KIR00001	176.00	11	177.16	-0.79	4.47	1.27	163.00	R13TSS		36.91		MODRES	CL		58.91	27M0F8W			P	5, 7
LBN	LBN27900	11.00	11	35.80	33.90	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.68	27M0F8W			P	
LBR	LBR24400	-33.50	11	-9.30	6.60	1.22	0.70	133.00	R13TSS		45.13		MODRES	CR		58.33	27M0F8W			P	7
LBY	LBY32100	-25.00	11	13.10	27.20	2.36	1.12	129.00	R13TSS		40.23		MODRES	CL		58.13	27M0F8W			P	
LIE	LIE25300	-37.00	11	9.50	47.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.48	27M0F8W			P	
LTU	LTU06100	23.00	11	23.79	55.66	0.70	0.60	176.00	R13TSS		48.21		MODRES	CL		58.91	27M0F8W			P	7
LUX	LUX11400	-19.00	11	6.00	49.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.98	27M0F8W			P	
NRU	NRU30900	134.00	11	167.00	-0.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		57.58	27M0F8W			P	
ROU	ROU13600	-1.00	11	25.00	45.70	1.38	0.66	155.00	R13TSS		44.85		MODRES	CL		58.85	27M0F8W			P	5, 7
SMO	SMO05700	158.00	11	-172.30	-13.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.78	27M0F8W			P	
SNG	SNG15100	74.00	11	103.80	1.30	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		58.68	27M0F8W			P	
SOM	SOM31200	23.00	11	45.00	6.40	3.26	1.54	71.00	R13TSS		37.44		MODRES	CR		57.44	27M0F8W			P	
SVK	SVK14400	17.00	11	19.65	48.69	0.82	0.60	5.20	R13TSS		47.53		MODRES	CR		58.93	27M0F8W			P	
UGA	UGA05100	11.00	11	32.30	1.20	1.46	1.12	60.00	R13TSS		42.31		MODRES	CR		58.31	27M0F8W			P	
UKR	UKR06300	38.00	11	31.74	48.22	2.29	0.96	177.78	R13TSS		41.01		MODRES	CL		58.91	27M0F8W			P	5, 7
USA	MRA33200	122.00	11	145.90	16.90	1.20	0.60	76.00	R13TSS		45.87		MODRES	CR		58.57	27M0F8W		14	P	
USA	MRA33201	122.00	11	145.90	16.90	1.20	0.60	76.00	R13TSS		45.87		MODRES	CR		58.57	27M0F8W		14	P	
UZB	UZB07100	44.00	11	64.01	41.21	2.67	0.96	163.32	R13TSS		40.37		MODRES	CL		58.87	27M0F8W			P	5, 7
VTN	VTN32500	86.00	11	108.00	14.80	3.80	1.90	126.00	R123FR		35.86		MODRES	CL		58.36	27M0F8W			P	7
VUT	VUT12800	140.00	11	168.00	-16.40	1.52	0.68	87.00	R13TSS		44.30		MODRES	CL		58.00	27M0F8W			P	
ZMB	ZMB31400	-1.00	11	27.50	-13.10	2.38	1.48	39.00	R13TSS		38.98		MODRES	CR		58.78	27M0F8W			P	
ALG	ALG25200	-25.00	12	1.60	25.50	3.64	2.16	152.00	R13TSS		35.49		MODRES	CR		57.89	27M0F8W			P	
AND	AND34100	-37.00	12	1.60	42.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.58	27M0F8W			P	
ARS	ARS00300	17.00	12	41.10	23.80	3.52	1.68	134.00	R13TSS		36.73		MODRES	CL		57.83	27M0F8W		70	P	
AUS	AUS00500	152.00	12	133.90	-18.40	2.82	1.74	105.00	R13TSS		37.53		MODRES	CL		59.43	27M0F8W			P	
AUT	AUT01600	-19.00	12	12.20	47.50	1.14	0.63	166.00	R13TSS		45.88		MODRES	CL		59.18	27M0F8W			P	
AZE	AZE06400	23.00	12	47.47	40.14	0.93	0.60	158.14	R13TSS		46.98		MODRES	CR		58.88	27M0F8W			P	5, 7
BRU	BRU3300A	74.00	12	114.70	4.40	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.48	27M0F8W			P	5, 7
BUL	BUL02000	-1.00	12	25.00	43.00	1.04	0.60	165.00	R13TSS		46.50		MODRES	CR		58.80	27M0F8W			P	
CHN	CHN15600	62.00	12	97.80	36.30	2.56	1.58	157.00	R13TSS		38.38		MODRES	CR		58.58	27M0F8W			P	
CHN	CHN17000	92.00	12	119.50	33.00	1.34	0.64	155.00	R13TSS		45.11		MODRES	CR		59.41	27M0F8W			P	
CHN	CHN17800	79.80	12	111.50	27.40	1.22	0.86	130.00	R13TSS		44.24		MODRES	CL		59.44	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
DNK	DNK08900	5.00	12	12.30	57.10	1.20	0.60	177.00	R13TSS		45.87		MODRES	CL		59.27	27M0F8W		28	P	
EGY	EGY02600	-7.00	12	29.70	26.80	2.33	1.72	136.00	R13TSS		38.42		MODRES	CL		58.22	27M0F8W			P	
F	F2_A2744	-7.00	12	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2784	-7.00	12	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2784	-7.00	12	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3384	-7.00	12	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2784	-7.00	12	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3384	-7.00	12	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	OCE10100	-160.00	12	-145.00	-16.30	4.34	3.54	4.00	R13TSS		32.58		MODRES	CL		58.58	27M0F8W			P	
F /EUT	E2WA7DA2	29.00	12	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	12	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	12	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	12	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	12	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	12	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	12	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
G	G 02700	-33.50	12	-3.50	53.80	1.84	0.72	142.00	R13TSS		43.23		MODRES	CR		60.13	27M0F8W			P	7
IND	IND04001	56.00	12	73.00	25.00	1.82	1.48	58.00	R13TSS		40.14		MODRES	CL		58.84	27M0F8W			P	
IND	IND04800	68.00	12	86.20	25.00	1.56	0.90	120.00	R13TSS		42.97		MODRES	CL		58.77	27M0F8W			P	
KOR	KO11201D	116.00	12	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40		R13RES	CL		63.70	27M0G7W	KOREASAT-1	20	AE	
KOR	KOR11200	110.00	12	127.50	36.00	1.24	1.02	168.00	R13TSS		43.43		MODRES	CL		58.73	27M0F8W		20	P	
KOR	KOR11201	116.00	12	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40		R13RES	CL		63.70	27M0F8W	KOREASAT-1	20	AE	
MAU	MAU24300	29.00	12	56.80	-13.90	1.56	1.38	65.00	R13TSS		41.12		MODRES	CR		58.82	27M0F8W			P	
MDA	MDA06300	38.00	12	28.41	46.99	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5, 7
MLD	MLD30600	44.00	12	73.10	6.00	0.96	0.60	90.00	R13TSS		46.84		MODRES	CR		58.74	27M0F8W			P	
MLI	MLI32800	-37.00	12	-7.60	13.20	1.74	1.24	171.00	R13TSS		41.11		MODRES	CR		58.81	27M0F8W			P	
MLT	MLT14700	-13.00	12	14.30	35.90	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		56.08	27M0F8W			P	
MOZ	MOZ30700	-1.00	12	34.00	-18.00	3.57	1.38	55.00	R13TSS		37.52		MODRES	CL		59.32	27M0F8W			P	
NZL	CKH05300	158.00	12	-163.00	-11.20	1.76	0.72	30.00	R13TSS		43.42		MODRES	CL		59.42	27M0F8W		4	P	
NZL	CKH05301	158.00	12	-163.00	-11.20	1.76	0.72	30.00	R13TSS		43.42		MODRES	CL		59.42	27M0F8W		4	P	
PAK	PAK21000	38.00	12	72.10	30.80	1.16	0.72	90.00	R13TSS		45.23		MODRES	CR		58.53	27M0F8W		74	P	
PAK	PAK21001	38.00	12	72.10	30.80	1.16	0.72	90.00	R13TSS		45.23		MODRES	CR		58.53	27M0F8W		74	P	
PLW	PLW00000	146.00	12	132.99	5.52	1.29	0.60	55.84	R13TSS		45.55		MODRES	CR		58.85	27M0F8W			P	7
PNG	PNG27100	128.00	12	148.00	-6.70	2.80	2.05	155.00	R13TSS		36.86		MODRES	CR		58.46	27M0F8W			P	
RRW	RRW31000	11.00	12	30.00	-2.10	0.66	0.60	42.00	R13TSS		48.47		MODRES	CL		59.87	27M0F8W			P	
S	SIRIUS02	5.20	12	14.00	63.00	1.30	0.70	142.00	R13TSS		42.50		R13RES	CR		58.00	27M0F8W	SIRIUS	28	AE	
STP	STP24100	-13.00	12	7.00	0.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.48	27M0F8W			P	
SVN	SVN14800	34.00	12	15.01	46.18	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5, 7
TON	TON21500	170.00	12	-174.70	-18.00	1.41	0.68	85.00	R13TSS		44.63		MODRES	CR		58.43	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
ZAI	ZAI32200	-19.00	12	22.40	0.00	2.16	1.88	48.00	R13TSS		38.36		MODRES	CR		59.76	27M0F8W			P	
AFG	AFG24600	50.00	13	64.50	33.10	1.44	1.40	21.00	R13TSS		41.40		MODRES	CR		58.40	27M0F8W			P	
AUS	AUS00900	164.00	13	147.50	-32.10	2.31	1.43	187.00	R13TSS		39.25		MODRES	CR		59.25	27M0F8W		78	P	
AUS	AUS0090A	164.00	13	159.06	-31.52	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		78	P	7
AUS	AUS0090B	164.00	13	167.93	-29.02	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		78	P	7
BLR	BLR06200	38.00	13	27.91	53.06	1.21	0.60	11.47	R13TSS		45.83		MODRES	CL		58.93	27M0F8W			P	5
BTN	BTN03100	86.00	13	90.44	27.05	0.72	0.60	175.47	R13TSS		48.11		MODRES	CR		58.91	27M0F8W			P	5
CHN	CHN15501	62.00	13	88.30	31.50	3.38	1.45	162.00	R13TSS		37.54		MODRES	CL		58.04	27M0F8W			P	
CHN	CHN18000	92.00	13	113.70	12.90	3.76	2.18	72.00	R13TSS		35.31		MODRES	CL		58.61	27M0F8W			P	
CHN	CHN19000	122.00	13	114.17	23.32	0.91	0.60	2.88	R13TSS		47.08		MODRES	CR		58.88	27M0F8W			P	5
CME	CME30000	-13.00	13	12.70	6.20	2.54	1.68	87.00	R13TSS		38.15		MODRES	CR		58.65	27M0F8W			P	
E	HISPASA2	-30.00	13	-8.80	35.40	3.00	1.90	45.00	R13TSS		36.90		MODRES	CL		59.00	27M0F8W	HISPASAT-2		A	5, 7
EST	EST06100	23.00	13	25.01	58.47	0.72	0.60	9.93	R13TSS		48.09		MODRES	CL		58.89	27M0F8W			P	5
F	F 09300	-19.00	13	2.60	45.90	2.50	0.98	160.00	R13TSS		40.56		R13RES	CR		63.96	27M0F8W		19	PE	
F	F 09306	-7.00	13	2.60	45.90	2.50	0.98	160.00	R13TSS		41.00		MODRES	CR		58.90	27M0F8W	RADIOSAT	19	A	
F	F3_A2751	-7.00	13	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3351	-7.00	13	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2751	-7.00	13	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3351	-7.00	13	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	13	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	13	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	13	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	13	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	13	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	13	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	13	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
FJI	FJI1930A	152.00	13	179.40	-17.90	1.04	0.98	67.00	R13TSS		44.36		MODRES	CR		58.76	27M0F8W			P	5, 7
GUI	GUI19200	-37.00	13	-11.00	10.20	1.58	1.04	147.00	R13TSS		42.29		MODRES	CL		58.59	27M0F8W			P	
HRV	HRV14800	34.00	13	16.74	44.54	0.88	0.69	5.30	R13TSS		46.57		MODRES	CL		58.87	27M0F8W			P	5
IND	IND03901	56.00	13	72.70	11.20	1.26	0.60	107.00	R13TSS		45.66		MODRES	CR		58.26	27M0F8W			P	
IND	IND04400	68.00	13	79.50	22.30	2.19	1.42	146.00	R13TSS		39.52		MODRES	CR		58.52	27M0F8W			P	
INS	INS03500	104.00	13	124.30	-3.20	3.34	1.94	82.00	R13TSS		36.33		MODRES	CR		58.43	27M0F8W			P	
J	000BS-3N	109.85	13	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		64.30	27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	13	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		64.30	27M0F8W		33	PE	
LBY	LBY28000	-25.00	13	21.40	26.00	2.50	1.04	119.00	R13TSS		40.30		MODRES	CL		58.60	27M0F8W			P	
MDG	MDG23600	29.00	13	46.60	-18.80	2.72	1.14	65.00	R13TSS		39.53		MODRES	CL		58.53	27M0F8W			P	
NZL	NZL05500	158.00	13	172.30	-39.70	2.88	1.56	47.00	R13TSS		37.92		MODRES	CR		58.52	27M0F8W			P	
NZL	NZL28700	128.00	13	173.00	-41.00	3.30	1.28	48.00	R13TSS		38.19		MODRES	CR		59.79	27M0F8W			P	
POL	POL13200	-1.00	13	19.30	51.80	1.46	0.64	162.00	R13TSS		44.74		MODRES	CL		59.34	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
QAT	QAT24700	17.00	13	51.10	25.30	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		56.98	27M0F8W			P	
SLM	SLM00000	146.00	13	159.32	-8.40	1.50	1.18	140.48	R13TSS		41.98		MODRES	CL		58.88	27M0F8W			P	5, 7
SMR	SMR31100	-37.00	13	12.60	43.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.58	27M0F8W			P	
SWZ	SWZ31300	-1.00	13	31.50	-26.50	0.62	0.60	66.00	R13TSS		48.74		MODRES	CR		58.04	27M0F8W			P	
THA	THA14200	74.00	13	100.70	13.20	2.82	1.54	106.00	R13TSS		38.07		MODRES	CL		58.77	27M0F8W			P	
TJK	TJK06900	44.00	13	71.14	38.37	1.25	0.76	159.15	R13TSS		44.65		MODRES	CL		58.85	27M0F8W			P	5
TUR	TUR14500	5.00	13	34.40	38.90	2.68	1.04	168.00	R13TSS		40.00		MODRES	CR		58.90	27M0F8W			P	
USA	PLM33700	170.00	13	-161.40	7.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.58	27M0F8W		9	P	
USA	PLM33701	170.00	13	-161.40	7.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.58	27M0F8W		9	P	
USA	SMA33500	170.00	13	-170.10	-14.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.28	27M0F8W		13	P	
USA	SMA33501	170.00	13	-170.10	-14.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.28	27M0F8W		13	P	
USA	WAK33400	140.00	13	166.50	19.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.68	27M0F8W		11	P	
USA	WAK33401	140.00	13	166.50	19.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.68	27M0F8W		11	P	
YEM	YEM26700	11.00	13	48.61	14.42	1.68	1.44	157.35	R13TSS		40.61		MODRES	CL		58.91	27M0F8W			P	7
	YYY00001	11.00	13	34.99	31.86	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	3, 5, 7
ALG	ALG25100	-25.00	14	4.20	33.20	2.45	1.25	172.00	R13TSS		39.59		MODRES	CR		58.59	27M0F8W			P	
ARS	ARS27500	17.00	14	48.30	24.60	3.84	1.20	138.00	R13TSS		37.81		MODRES	CL		58.01	27M0F8W			P	
AUS	AUS00600	152.00	14	136.60	-30.90	2.41	1.52	161.00	R13TSS		38.80		MODRES	CL		58.40	27M0F8W			P	
AUS	AUS00800	164.00	14	145.90	-21.70	3.62	1.63	136.00	R13TSS		36.73		MODRES	CL		58.83	27M0F8W			P	
BIH	BIH14800	34.00	14	17.77	44.32	0.62	0.60	166.84	R13TSS		48.71		MODRES	CR		58.91	27M0F8W			P	5
BOT	BOT29700	-1.00	14	23.30	-22.20	2.13	1.50	36.00	R13TSS		39.40		MODRES	CL		58.90	27M0F8W			P	
BRU	BRU3300A	74.00	14	114.70	4.40	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.58	27M0F8W			P	5
CHN	CHN15401	62.00	14	83.90	40.50	2.75	2.05	177.00	R13TSS		36.94		MODRES	CR		58.44	27M0F8W			P	
CHN	CHN17200	92.00	14	120.40	29.10	0.96	0.84	123.00	R13TSS		45.38		MODRES	CR		59.28	27M0F8W			P	
CHN	CHN18100	79.80	14	108.50	23.80	1.41	1.08	153.00	R13TSS		42.62		MODRES	CL		59.12	27M0F8W			P	
CLN	CLN21900	50.00	14	80.60	7.70	1.18	0.60	106.00	R13TSS		45.95		MODRES	CR		58.85	27M0F8W			P	
D	D 08700	-19.00	14	9.60	49.90	1.62	0.72	147.00	R13TSS		43.78		MODRES	CL		60.68	27M0F8W			P	
F	F2_A2722	-7.00	14	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		57.70	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2722	-7.00	14	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		57.70	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2762	-7.00	14	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		57.70	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2722	-7.00	14	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A2762	-7.00	14	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3322	-7.00	14	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_A3362	-7.00	14	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2722	-7.00	14	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D2762	-7.00	14	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3322	-7.00	14	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	F3_D3362	-7.00	14	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	NCL10000	140.00	14	166.00	-21.00	1.14	0.72	146.00	R13TSS		45.30		MODRES	CR		58.90	27M0F8W		6	P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F	NCL10001	140.00	14	166.00	-21.00	1.14	0.72	146.00	R13TSS		45.30		MODRES	CR		58.90	27M0F8W		6	P	
F	WAL10200	140.00	14	-176.80	-14.00	0.74	0.60	29.00	R13TSS		47.97		MODRES	CR		59.57	27M0F8W		8	P	
F	WAL10201	140.00	14	-176.80	-14.00	0.74	0.60	29.00	R13TSS		47.97		MODRES	CR		59.57	27M0F8W		8	P	
F /EUT	E2WA7DA2	29.00	14	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	14	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	14	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	14	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	14	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	14	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	14	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
GNB	GNB30400	-30.00	14	-15.00	12.00	0.90	0.60	172.00	R13TSS		47.12		MODRES	CL		58.32	27M0F8W			P	7
IND	IND03701	68.00	14	93.00	25.50	1.46	1.13	40.00	R13TSS		42.27		MODRES	CL		59.07	27M0F8W			P	
IND	IND04500	56.00	14	76.20	19.50	1.58	1.58	21.00	R13TSS		40.47		MODRES	CL		58.67	27M0F8W			P	
IRL	IRL21100	-33.50	14	-8.20	53.20	0.84	0.60	162.00	R13TSS		47.42		MODRES	CR		59.42	27M0F8W			P	7
KRE	KRE28600	110.00	14	127.00	39.10	1.30	1.10	31.00	R13TSS		42.89		MODRES	CL		58.99	27M0F8W			P	
MAU	MAU24200	29.00	14	59.80	-18.90	1.62	1.24	55.00	R13TSS		41.42		MODRES	CR		59.12	27M0F8W			P	
MHL	MHL00000	146.00	14	167.64	9.83	2.07	0.90	157.42	R13TSS		41.75		MODRES	CR		58.95	27M0F8W			P	7
MKD	MKD14800	23.00	14	21.61	41.56	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5
MLI	MLI32700	-37.00	14	-2.00	19.00	2.66	1.26	127.00	R13TSS		39.19		MODRES	CR		58.19	27M0F8W			P	
NOR	BIFROS22	-0.80	14	17.00	61.50					NO9	32.00	6.00	MODRES	CR		54.50	27M0FXF	BIFROST-2		A	
NOR	NOR12000	5.00	14	13.10	64.10	1.84	0.88	10.00	R13TSS		42.35		MODRES	CL		59.95	27M0F8W			P	
NZL	CKH05200	158.00	14	-161.00	-19.80	1.02	0.64	132.00	R13TSS		46.30		MODRES	CL		59.80	27M0F8W		3	P	
NZL	CKH05201	158.00	14	-161.00	-19.80	1.02	0.64	132.00	R13TSS		46.30		MODRES	CL		59.80	27M0F8W		3	P	
PAK	PAK21000	38.00	14	72.10	30.80	1.16	0.72	90.00	R13TSS		45.23		MODRES	CR		58.63	27M0F8W		74	P	
PNG	PNG13100	110.00	14	147.70	-6.30	2.50	2.18	169.00	R13TSS		37.08		MODRES	CR		59.58	27M0F8W			P	
TCD	TCD14300	-13.00	14	18.10	15.50	3.40	1.72	107.00	R13TSS		36.78		MODRES	CL		59.08	27M0F8W			P	
TGO	TGO22600	-25.00	14	0.80	8.60	1.52	0.60	105.00	R13TSS		44.85		MODRES	CL		58.55	27M0F8W			P	
TUV	TUV00000	176.00	14	177.61	-7.11	0.94	0.60	137.58	R13TSS		46.93		MODRES	CR		58.93	27M0F8W			P	
USA	GUM33100	122.00	14	144.50	13.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		58.48	27M0F8W		15	P	
USA	GUM33101	122.00	14	144.50	13.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		58.48	27M0F8W		15	P	
YEM	YEM26600	11.00	14	44.00	15.67	0.80	0.60	114.88	R13TSS		47.66		MODRES	CR		58.86	27M0F8W			P	
ZAI	ZAI32300	-19.00	14	21.30	-6.80	2.80	1.52	149.00	R13TSS		38.16		MODRES	CR		59.76	27M0F8W			P	
AFG	AFG24500	50.00	15	70.20	35.50	1.32	1.13	53.00	R13TSS		42.71		MODRES	CR		58.01	27M0F8W			P	
AUS	AUS00400	152.00	15	123.00	-24.20	3.06	2.17	102.00	R13TSS		36.22		MODRES	CR		58.22	27M0F8W		76	P	
AUS	AUS0040A	152.00	15	96.83	-12.19	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	
AUS	AUS0040B	152.00	15	105.69	-10.45	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	
AUS	AUS0040C	152.00	15	110.52	-66.28	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	
AUS	AUS00700	164.00	15	145.20	-38.10	2.12	1.02	147.00	R13TSS		41.09		MODRES	CR		58.49	27M0F8W		77	P	
AUS	AUS0070A	164.00	15	158.94	-54.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		77	P	7

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
BEN	BEN23300	-19.00	15	2.20	9.50	1.44	0.68	97.00	R13TSS		44.54		MODRES	CL		58.44	27M0F8W			P	
BGD	BGD22000	74.00	15	90.30	23.60	1.46	0.84	135.00	R13TSS		43.56		MODRES	CR		58.66	27M0F8W			P	
CHN	CHN15800	79.80	15	111.80	38.00	2.60	1.74	124.00	R13TSS		37.89		MODRES	CR		59.89	27M0F8W			P	
CHN	CHN17400	92.00	15	118.10	25.90	1.02	0.84	82.00	R13TSS		45.12		MODRES	CL		59.12	27M0F8W			P	
COM	COM20700	29.00	15	44.10	-12.10	0.76	0.60	149.00	R13TSS		47.86		MODRES	CL		58.26	27M0F8W			P	
E	HISPASA2	-30.00	15	-8.80	35.40	3.00	1.90	45.00	R13TSS		36.90		MODRES	CL		59.00	27M0F8W	HISPASAT-2		A	5
F	F2_A2733	-7.00	15	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CR		57.70	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2773	-7.00	15	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CR		57.70	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2773	-7.00	15	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3373	-7.00	15	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2773	-7.00	15	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3373	-7.00	15	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	15	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	15	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	15	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	15	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	15	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	15	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	15	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
FSM	FSM00000	146.00	15	151.67	5.42	5.34	1.51	166.52	R13TSS		35.37		MODRES	CL		58.87	27M0F8W			P	5, 7
GAB	GAB26000	-13.00	15	11.80	-0.60	1.43	1.12	64.00	R13TSS		42.40		MODRES	CR		58.50	27M0F8W			P	
GMB	GMB30200	-37.00	15	-15.10	13.40	0.79	0.60	4.00	R13TSS		47.69		MODRES	CL		58.49	27M0F8W			P	
GRC	GRC10500	5.00	15	24.70	38.20	1.78	0.98	156.00	R13TSS		42.03		MODRES	CR		58.53	27M0F8W			P	
IND	IND04301	56.00	15	77.80	11.10	1.36	1.28	172.00	R13TSS		42.04		MODRES	CR		58.54	27M0F8W			P	
IND	IND04700	68.00	15	93.30	11.10	1.92	0.60	96.00	R13TSS		43.83		MODRES	CR		58.63	27M0F8W			P	
INS	INS03600	104.00	15	135.20	-3.80	2.46	2.00	147.00	R13TSS		37.53		MODRES	CR		58.93	27M0F8W			P	
IRN	IRN10900	34.00	15	54.20	32.40	3.82	1.82	149.00	R13TSS		36.03		MODRES	CL		58.03	27M0F8W		72	P	
J	000BS-3N	109.85	15	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		64.40	27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	15	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		R13RES	CR		64.40	27M0F8W		33	PE	
KIR	KIR00002	176.00	15	-157.78	-0.33	2.40	0.64	110.62	R13TSS		42.60		MODRES	CL		58.90	27M0F8W			P	5
LBN	LBN27900	11.00	15	35.80	33.90	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.78	27M0F8W			P	
LBR	LBR24400	-33.50	15	-9.30	6.60	1.22	0.70	133.00	R13TSS		45.13		MODRES	CR		58.43	27M0F8W			P	7
LBY	LBY32100	-25.00	15	13.10	27.20	2.36	1.12	129.00	R13TSS		40.23		MODRES	CL		58.23	27M0F8W			P	
LIE	LIE25300	-37.00	15	9.50	47.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.58	27M0F8W			P	
LTU	LTU06100	23.00	15	23.79	55.66	0.70	0.60	176.00	R13TSS		48.21		MODRES	CL		58.91	27M0F8W			P	
LUX	LUX11400	-19.00	15	6.00	49.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.08	27M0F8W			P	
NRU	NRU30900	134.00	15	167.00	-0.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		57.68	27M0F8W			P	
ROU	ROU13600	-1.00	15	25.00	45.70	1.38	0.66	155.00	R13TSS		44.85		MODRES	CL		58.95	27M0F8W			P	5
SMO	SMO05700	158.00	15	-172.30	-13.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.78	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
SNG	SNG15100	74.00	15	103.80	1.30	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		58.68	27M0F8W			P	
SOM	SOM31200	23.00	15	45.00	6.40	3.26	1.54	71.00	R13TSS		37.44		MODRES	CR		57.54	27M0F8W			P	
SVK	SVK14400	17.00	15	19.65	48.69	0.82	0.60	5.20	R13TSS		47.53		MODRES	CR		58.93	27M0F8W			P	
UGA	UGA05100	11.00	15	32.30	1.20	1.46	1.12	60.00	R13TSS		42.31		MODRES	CR		58.41	27M0F8W			P	
UKR	UKR06300	38.00	15	31.74	48.22	2.29	0.96	177.78	R13TSS		41.01		MODRES	CL		58.91	27M0F8W			P	5
USA	MRA33200	122.00	15	145.90	16.90	1.20	0.60	76.00	R13TSS		45.87		MODRES	CR		58.57	27M0F8W		14	P	
USA	MRA33201	122.00	15	145.90	16.90	1.20	0.60	76.00	R13TSS		45.87		MODRES	CR		58.57	27M0F8W		14	P	
UZB	UZB07100	44.00	15	64.01	41.21	2.67	0.96	163.32	R13TSS		40.37		MODRES	CL		58.87	27M0F8W			P	5
VTN	VTN32500	86.00	15	108.00	14.80	3.80	1.90	126.00	R123FR		35.86		MODRES	CL		58.36	27M0F8W			P	
VUT	VUT12800	140.00	15	168.00	-16.40	1.52	0.68	87.00	R13TSS		44.30		MODRES	CL		58.00	27M0F8W			P	
ZMB	ZMB31400	-1.00	15	27.50	-13.10	2.38	1.48	39.00	R13TSS		38.98		MODRES	CR		58.88	27M0F8W			P	
ALG	ALG25200	-25.00	16	1.60	25.50	3.64	2.16	152.00	R13TSS		35.49		MODRES	CR		57.99	27M0F8W			P	
AND	AND34100	-37.00	16	1.60	42.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.58	27M0F8W			P	
ARS	ARS00300	17.00	16	41.10	23.80	3.52	1.68	134.00	R13TSS		36.73		MODRES	CL		57.83	27M0F8W		70	P	
AUS	AUS00500	152.00	16	133.90	-18.40	2.82	1.74	105.00	R13TSS		37.53		MODRES	CL		59.43	27M0F8W			P	
AUT	AUT01600	-19.00	16	12.20	47.50	1.14	0.63	166.00	R13TSS		45.88		MODRES	CL		59.28	27M0F8W			P	
AZE	AZE06400	23.00	16	47.47	40.14	0.93	0.60	158.14	R13TSS		46.98		MODRES	CR		58.88	27M0F8W			P	5
BRU	BRU3300A	74.00	16	114.70	4.40	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.58	27M0F8W			P	5
BUL	BUL02000	-1.00	16	25.00	43.00	1.04	0.60	165.00	R13TSS		46.50		MODRES	CR		58.80	27M0F8W			P	
CHN	CHN16900	92.00	16	118.50	36.40	1.16	0.76	11.00	R13TSS		44.99		MODRES	CR		59.69	27M0F8W			P	
CHN	CHN18600	62.00	16	102.50	30.20	1.91	1.23	147.00	R13TSS		40.74		MODRES	CL		60.54	27M0F8W			P	
DNK	DNK08900	5.00	16	12.30	57.10	1.20	0.60	177.00	R13TSS		45.87		MODRES	CL		59.37	27M0F8W		28	P	
EGY	EGY02600	-7.00	16	29.70	26.80	2.33	1.72	136.00	R13TSS		38.42		MODRES	CL		58.32	27M0F8W			P	
F	F2_A2744	-7.00	16	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2784	-7.00	16	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2784	-7.00	16	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3384	-7.00	16	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2784	-7.00	16	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3384	-7.00	16	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	OCE10100	-160.00	16	-145.00	-16.30	4.34	3.54	4.00	R13TSS		32.58		MODRES	CL		58.68	27M0F8W			P	
F /EUT	E2WA7DA2	29.00	16	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	16	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	16	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	16	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	16	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	16	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	16	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
G	G 02700	-33.50	16	-3.50	53.80	1.84	0.72	142.00	R13TSS		43.23		MODRES	CR		60.23	27M0F8W			P	7
IND	IND04000	56.00	16	73.00	25.00	1.82	1.48	58.00	R13TSS		40.14		MODRES	CL		58.84	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
IND	IND04801	68.00	16	86.20	25.00	1.56	0.90	120.00	R13TSS		42.97		MODRES	CL		60.47	27M0F8W			P	
KRE	KRE28600	110.00	16	127.00	39.10	1.30	1.10	31.00	R13TSS		42.89		MODRES	CL		58.99	27M0F8W			P	
MAU	MAU24300	29.00	16	56.80	-13.90	1.56	1.38	65.00	R13TSS		41.12		MODRES	CR		58.92	27M0F8W			P	
MDA	MDA06300	38.00	16	28.41	46.99	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5
MLA	MLA22700	86.00	16	102.10	4.10	1.62	0.82	135.00	R13TSS		43.21		MODRES	CR		58.21	27M0F8W			P	1
MLD	MLD30600	44.00	16	73.10	6.00	0.96	0.60	90.00	R13TSS		46.84		MODRES	CR		58.74	27M0F8W			P	
MLI	MLI32800	-37.00	16	-7.60	13.20	1.74	1.24	171.00	R13TSS		41.11		MODRES	CR		58.91	27M0F8W			P	
MLT	MLT14700	-13.00	16	14.30	35.90	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		56.18	27M0F8W			P	
MOZ	MOZ30700	-1.00	16	34.00	-18.00	3.57	1.38	55.00	R13TSS		37.52		MODRES	CL		59.42	27M0F8W			P	
NZL	CKH05300	158.00	16	-163.00	-11.20	1.76	0.72	30.00	R13TSS		43.42		MODRES	CL		59.52	27M0F8W		4	P	
NZL	CKH05301	158.00	16	-163.00	-11.20	1.76	0.72	30.00	R13TSS		43.42		MODRES	CL		59.52	27M0F8W		4	P	
PHL	PHL28500	98.00	16	121.30	11.10	3.46	1.76	99.00	R13TSS		36.60		MODRES	CL		58.70	27M0F8W			P	
PLW	PLW00000	146.00	16	132.99	5.52	1.29	0.60	55.84	R13TSS		45.55		MODRES	CR		58.85	27M0F8W			P	7
RRW	RRW31000	11.00	16	30.00	-2.10	0.66	0.60	42.00	R13TSS		48.47		MODRES	CL		59.97	27M0F8W			P	
S	SIRIUS02	5.20	16	14.00	63.00	1.30	0.70	142.00	R13TSS		42.50		R13RES	CR		58.00	27M0F8W	SIRIUS	28	AE	
STP	STP24100	-13.00	16	7.00	0.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.58	27M0F8W			P	
SVN	SVN14800	34.00	16	15.01	46.18	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5
TON	TON21500	170.00	16	-174.70	-18.00	1.41	0.68	85.00	R13TSS		44.63		MODRES	CR		58.53	27M0F8W			P	
ZAI	ZAI32200	-19.00	16	22.40	0.00	2.16	1.88	48.00	R13TSS		38.36		MODRES	CR		59.86	27M0F8W			P	
AUS	AUS00900	164.00	17	147.50	-32.10	2.31	1.43	187.00	R13TSS		39.25		MODRES	CR		59.25	27M0F8W		78	P	
AUS	AUS0090A	164.00	17	159.06	-31.52	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		78	P	7
AUS	AUS0090B	164.00	17	167.93	-29.02	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		78	P	7
BLR	BLR06200	38.00	17	27.91	53.06	1.21	0.60	11.47	R13TSS		45.83		MODRES	CL		58.93	27M0F8W			P	5
BRM	BRM29800	74.00	17	97.10	19.10	3.58	1.48	104.00	R13TSS		37.21		MODRES	CL		58.91	27M0F8W			P	
BTN	BTN03100	86.00	17	90.44	27.05	0.72	0.60	175.47	R13TSS		48.11		MODRES	CR		58.91	27M0F8W			P	5
CHN	CHN16700	92.00	17	124.30	43.70	1.98	0.72	156.00	R13TSS		42.91		MODRES	CL		59.71	27M0F8W			P	
CHN	CHN18200	79.80	17	108.70	35.10	1.42	0.88	109.00	R13TSS		43.48		MODRES	CR		59.18	27M0F8W			P	
CME	CME30000	-13.00	17	12.70	6.20	2.54	1.68	87.00	R13TSS		38.15		MODRES	CR		58.65	27M0F8W			P	
E	HISPASA2	-30.00	17	-8.80	35.40	3.00	1.90	45.00	R13TSS		36.90		MODRES	CL		59.00	27M0F8W	HISPASAT-2		A	5
EST	EST06100	23.00	17	25.01	58.47	0.72	0.60	9.93	R13TSS		48.09		MODRES	CL		58.89	27M0F8W			P	5
F	F 09300	-19.00	17	2.60	45.90	2.50	0.98	160.00	R13TSS		40.56		R13RES	CR		63.96	27M0F8W		19	PE	
F	F 09306	-7.00	17	2.60	45.90	2.50	0.98	160.00	R13TSS		41.00		MODRES	CR		58.90	27M0F8W	RADIOSAT	19	A	
F	F3_A2751	-7.00	17	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3351	-7.00	17	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2751	-7.00	17	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3351	-7.00	17	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	17	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	17	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	17	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F /EUT	E2WA7DD1	29.00	17	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	17	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	17	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	17	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
GUI	GUI19200	-37.00	17	-11.00	10.20	1.58	1.04	147.00	R13TSS		42.29		MODRES	CL		58.69	27M0F8W			P	
HRV	HRV14800	34.00	17	16.74	44.54	0.88	0.69	5.30	R13TSS		46.57		MODRES	CL		58.87	27M0F8W			P	5
IND	IND03801	56.00	17	75.90	33.40	1.52	1.08	33.00	R13TSS		42.29		MODRES	CR		59.29	27M0F8W			P	
IND	IND04600	68.00	17	84.70	20.50	1.60	0.86	30.00	R13TSS		43.06		MODRES	CR		58.56	27M0F8W			P	
INS	INS03200	80.20	17	112.30	-0.30	2.66	2.32	109.00	R13TSS		36.54		MODRES	CL		59.04	27M0F8W			P	
LBY	LBY28000	-25.00	17	21.40	26.00	2.50	1.04	119.00	R13TSS		40.30		MODRES	CL		58.70	27M0F8W			P	
MDG	MDG23600	29.00	17	46.60	-18.80	2.72	1.14	65.00	R13TSS		39.53		MODRES	CL		58.53	27M0F8W			P	
NPL	NPL12200	50.00	17	83.70	28.30	1.72	0.60	163.00	R13TSS		44.31		MODRES	CL		59.61	27M0F8W			P	
NZL	NZL28700	128.00	17	173.00	-41.00	3.30	1.28	48.00	R13TSS		38.19		MODRES	CR		59.79	27M0F8W			P	
POL	POL13200	-1.00	17	19.30	51.80	1.46	0.64	162.00	R13TSS		44.74		MODRES	CL		59.34	27M0F8W			P	
QAT	QAT24700	17.00	17	51.10	25.30	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		56.98	27M0F8W			P	1
SMR	SMR31100	-37.00	17	12.60	43.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.68	27M0F8W			P	
SWZ	SWZ31300	-1.00	17	31.50	-26.50	0.62	0.60	66.00	R13TSS		48.74		MODRES	CR		58.04	27M0F8W			P	
TJK	TJK06900	44.00	17	71.14	38.37	1.25	0.76	159.15	R13TSS		44.65		MODRES	CL		58.85	27M0F8W			P	5
TUR	TUR14500	5.00	17	34.40	38.90	2.68	1.04	168.00	R13TSS		40.00		MODRES	CR		58.90	27M0F8W			P	
USA	PLM33700	170.00	17	-161.40	7.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.58	27M0F8W		9	P	
USA	PLM33701	170.00	17	-161.40	7.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.58	27M0F8W		9	P	
USA	SMA33500	170.00	17	-170.10	-14.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.38	27M0F8W		13	P	
USA	SMA33501	170.00	17	-170.10	-14.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.38	27M0F8W		13	P	
USA	WAK33400	140.00	17	166.50	19.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.78	27M0F8W		11	P	
USA	WAK33401	140.00	17	166.50	19.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.78	27M0F8W		11	P	
YEM	YEM26700	11.00	17	48.61	14.42	1.68	1.44	157.35	R13TSS		40.61		MODRES	CL		58.91	27M0F8W			P	
	YYY00001	11.00	17	34.99	31.86	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	3, 5
ALG	ALG25100	-25.00	18	4.20	33.20	2.45	1.25	172.00	R13TSS		39.59		MODRES	CR		58.59	27M0F8W			P	
ARS	ARS27500	17.00	18	48.30	24.60	3.84	1.20	138.00	R13TSS		37.81		MODRES	CL		58.01	27M0F8W			P	
AUS	AUS00600	152.00	18	136.60	-30.90	2.41	1.52	161.00	R13TSS		38.80		MODRES	CL		58.40	27M0F8W			P	
AUS	AUS00800	164.00	18	145.90	-21.70	3.62	1.63	136.00	R13TSS		36.73		MODRES	CL		58.83	27M0F8W			P	
BGD	BGD22000	74.00	18	90.30	23.60	1.46	0.84	135.00	R13TSS		43.56		MODRES	CR		58.66	27M0F8W			P	
BIH	BIH14800	34.00	18	17.77	44.32	0.62	0.60	166.84	R13TSS		48.71		MODRES	CR		58.91	27M0F8W			P	5
BOT	BOT29700	-1.00	18	23.30	-22.20	2.13	1.50	36.00	R13TSS		39.40		MODRES	CL		59.00	27M0F8W			P	
BRU	BRU3300A	74.00	18	114.70	4.40	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.58	27M0F8W			P	5
CBG	CBG29900	68.00	18	105.00	12.70	1.01	0.90	110.00	R13TSS		44.86		MODRES	CR		59.26	27M0F8W			P	
CHN	CHN15900	79.80	18	109.40	27.30	2.14	1.72	107.00	R13TSS		38.79		MODRES	CL		59.49	27M0F8W			P	
CHN	CHN18500	62.00	18	95.70	35.40	2.10	1.14	156.00	R13TSS		40.66		MODRES	CR		58.36	27M0F8W			P	
D	D 08700	-19.00	18	9.60	49.90	1.62	0.72	147.00	R13TSS		43.78		MODRES	CL		60.68	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F	F2_A2722	-7.00	18	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		57.20	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2722	-7.00	18	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		57.20	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2762	-7.00	18	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		57.20	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2722	-7.00	18	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A2762	-7.00	18	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3322	-7.00	18	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_A3362	-7.00	18	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2722	-7.00	18	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D2762	-7.00	18	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3322	-7.00	18	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	F3_D3362	-7.00	18	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA2	29.00	18	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	18	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	18	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	18	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	18	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	18	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	18	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
GNB	GNB30400	-30.00	18	-15.00	12.00	0.90	0.60	172.00	R13TSS		47.12		MODRES	CL		58.32	27M0F8W			P	7
IND	IND04100	56.00	18	78.40	16.00	2.08	1.38	35.00	R13TSS		39.87		MODRES	CL		58.77	27M0F8W			P	
IND	IND04201	68.00	18	79.30	27.70	2.14	1.16	147.00	R13TSS		40.50		MODRES	CL		58.80	27M0F8W			P	
INS	INS03000	80.20	18	112.30	-8.10	3.14	1.46	169.00	R13TSS		37.83		MODRES	CR		59.23	27M0F8W			P	
IRL	IRL21100	-33.50	18	-8.20	53.20	0.84	0.60	162.00	R13TSS		47.42		MODRES	CR		59.52	27M0F8W			P	7
KRE	KRE28600	110.00	18	127.00	39.10	1.30	1.10	31.00	R13TSS		42.89		MODRES	CL		58.99	27M0F8W			P	
MAU	MAU24200	29.00	18	59.80	-18.90	1.62	1.24	55.00	R13TSS		41.42		MODRES	CR		59.22	27M0F8W			P	
MHL	MHL00000	146.00	18	167.64	9.83	2.07	0.90	157.42	R13TSS		41.75		MODRES	CR		58.95	27M0F8W			P	7
MKD	MKD14800	23.00	18	21.61	41.56	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5
MLA	MLA22700	86.00	18	102.10	4.10	1.62	0.82	135.00	R13TSS		43.21		MODRES	CR		58.31	27M0F8W			P	
MLI	MLI32700	-37.00	18	-2.00	19.00	2.66	1.26	127.00	R13TSS		39.19		MODRES	CR		58.19	27M0F8W			P	
NOR	BIFROS22	-0.80	18	17.00	61.50					NO9	32.00	6.00	MODRES	CR		54.50	27M0FXF	BIFROST-2		A	
NOR	NOR12000	5.00	18	13.10	64.10	1.84	0.88	10.00	R13TSS		42.35		MODRES	CL		59.95	27M0F8W			P	
PAK	PAK28100	38.00	18	65.20	27.90	1.52	1.42	28.00	R13TSS		41.11		MODRES	CR		58.01	27M0F8W			P	
PHL	PHL28500	98.00	18	121.30	11.10	3.46	1.76	99.00	R13TSS		36.60		MODRES	CL		58.70	27M0F8W			P	
TCD	TCD14300	-13.00	18	18.10	15.50	3.40	1.72	107.00	R13TSS		36.78		MODRES	CL		59.18	27M0F8W			P	
TGO	TGO22600	-25.00	18	0.80	8.60	1.52	0.60	105.00	R13TSS		44.85		MODRES	CL		58.65	27M0F8W			P	
USA	GUM33100	122.00	18	144.50	13.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		58.48	27M0F8W		15	P	
USA	GUM33101	122.00	18	144.50	13.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		58.48	27M0F8W		15	P	
YEM	YEM26600	11.00	18	44.00	15.67	0.80	0.60	114.88	R13TSS		47.66		MODRES	CR		58.86	27M0F8W			P	
ZAI	ZAI32300	-19.00	18	21.30	-6.80	2.80	1.52	149.00	R13TSS		38.16		MODRES	CR		59.86	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
AUS	AUS00400	152.00	19	123.00	-24.20	3.06	2.17	102.00	R13TSS		36.22		MODRES	CR		58.22	27M0F8W		76	P	
AUS	AUS0040A	152.00	19	96.83	-12.19	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	
AUS	AUS0040B	152.00	19	105.69	-10.45	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	
AUS	AUS0040C	152.00	19	110.52	-66.28	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	
AUS	AUS00700	164.00	19	145.20	-38.10	2.12	1.02	147.00	R13TSS		41.09		MODRES	CR		58.49	27M0F8W		77	P	
AUS	AUS0070A	164.00	19	158.94	-54.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		77	P	7
BEN	BEN23300	-19.00	19	2.20	9.50	1.44	0.68	97.00	R13TSS		44.54		MODRES	CL		58.54	27M0F8W			P	
BRM	BRM29800	74.00	19	97.10	19.10	3.58	1.48	104.00	R13TSS		37.21		MODRES	CL		58.91	27M0F8W			P	
CHN	CHN15800	79.80	19	111.80	38.00	2.60	1.74	124.00	R13TSS		37.89		MODRES	CR		59.89	27M0F8W			P	
CHN	CHN17900	92.00	19	112.20	21.90	1.84	1.22	37.00	R13TSS		40.94		MODRES	CL		58.84	27M0F8W			P	
COM	COM2070A	29.00	19	44.10	-12.10	0.76	0.60	149.00	R13TSS		47.86		MODRES	CL		58.26	27M0F8W			P	5
E	HISPASA2	-30.00	19	-8.80	35.40	3.00	1.90	45.00	R13TSS		36.90		MODRES	CL		59.00	27M0F8W	HISPASAT-2		A	5
F	F2_A2733	-7.00	19	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CR		57.20	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2773	-7.00	19	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CR		57.20	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2773	-7.00	19	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3373	-7.00	19	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2773	-7.00	19	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3373	-7.00	19	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	68.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	19	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	19	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	19	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	19	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	19	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	19	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	19	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
FSM	FSM00000	146.00	19	151.67	5.42	5.34	1.51	166.52	R13TSS		35.37		MODRES	CL		58.87	27M0F8W			P	5, 7
GAB	GAB26000	-13.00	19	11.80	-0.60	1.43	1.12	64.00	R13TSS		42.40		MODRES	CR		58.60	27M0F8W			P	
GMB	GMB30200	-37.00	19	-15.10	13.40	0.79	0.60	4.00	R13TSS		47.69		MODRES	CL		58.49	27M0F8W			P	
GRC	GRC10500	5.00	19	24.70	38.20	1.78	0.98	156.00	R13TSS		42.03		MODRES	CR		58.53	27M0F8W			P	
IND	IND03800	56.00	19	75.90	33.40	1.52	1.08	33.00	R13TSS		42.29		MODRES	CR		59.29	27M0F8W			P	
IND	IND04601	68.00	19	84.70	20.50	1.60	0.86	30.00	R13TSS		43.06		MODRES	CR		58.56	27M0F8W			P	
INS	INS03200	80.20	19	112.30	-0.30	2.66	2.32	109.00	R13TSS		36.54		MODRES	CL		59.14	27M0F8W			P	
INS	INS03600	104.00	19	135.20	-3.80	2.46	2.00	147.00	R13TSS		37.53		MODRES	CR		59.03	27M0F8W			P	1
IRN	IRN10900	34.00	19	54.20	32.40	3.82	1.82	149.00	R13TSS		36.03		MODRES	CL		58.03	27M0F8W		72	P	
KIR	KIR00002	176.00	19	-157.78	-0.33	2.40	0.64	110.62	R13TSS		42.60		MODRES	CL		58.90	27M0F8W			P	5
LBN	LBN27900	11.00	19	35.80	33.90	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.78	27M0F8W			P	
LBR	LBR2440A	-33.50	19	-9.30	6.60	1.22	0.70	133.00	R13TSS		45.13		MODRES	CR		58.43	27M0F8W			P	5, 7
LBY	LBY32100	-25.00	19	13.10	27.20	2.36	1.12	129.00	R13TSS		40.23		MODRES	CL		58.33	27M0F8W			P	
LIE	LIE25300	-37.00	19	9.50	47.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.58	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
LTU	LTU06100	23.00	19	23.79	55.66	0.70	0.60	176.00	R13TSS		48.21		MODRES	CL		58.91	27M0F8W			P	
LUX	LUX11400	-19.00	19	6.00	49.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.08	27M0F8W			P	
NPL	NPL12200	50.00	19	83.70	28.30	1.72	0.60	163.00	R13TSS		44.31		MODRES	CL		59.61	27M0F8W			P	
NZL	NIU05400	158.00	19	-169.80	-19.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		59.08	27M0F8W		2	P	
NZL	NIU05401	158.00	19	-169.80	-19.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		59.08	27M0F8W		2	P	
ROU	ROU13600	-1.00	19	25.00	45.70	1.38	0.66	155.00	R13TSS		44.85		MODRES	CL		58.95	27M0F8W			P	5
SOM	SOM31200	23.00	19	45.00	6.40	3.26	1.54	71.00	R13TSS		37.44		MODRES	CR		57.64	27M0F8W			P	
SVK	SVK14400	17.00	19	19.65	48.69	0.82	0.60	5.20	R13TSS		47.53		MODRES	CR		58.93	27M0F8W			P	
UGA	UGA05100	11.00	19	32.30	1.20	1.46	1.12	60.00	R13TSS		42.31		MODRES	CR		58.41	27M0F8W			P	
UKR	UKR06300	38.00	19	31.74	48.22	2.29	0.96	177.78	R13TSS		41.01		MODRES	CL		58.91	27M0F8W			P	5
USA	MRA33200	122.00	19	145.90	16.90	1.20	0.60	76.00	R13TSS		45.87		MODRES	CR		58.67	27M0F8W		14	P	
USA	MRA33201	122.00	19	145.90	16.90	1.20	0.60	76.00	R13TSS		45.87		MODRES	CR		58.67	27M0F8W		14	P	
UZB	UZB07100	44.00	19	64.01	41.21	2.67	0.96	163.32	R13TSS		40.37		MODRES	CL		58.87	27M0F8W			P	5
ZMB	ZMB31400	-1.00	19	27.50	-13.10	2.38	1.48	39.00	R13TSS		38.98		MODRES	CR		58.88	27M0F8W			P	
ALG	ALG25200	-25.00	20	1.60	25.50	3.64	2.16	152.00	R13TSS		35.49		MODRES	CR		57.99	27M0F8W			P	
AND	AND34100	-37.00	20	1.60	42.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.68	27M0F8W			P	
ARS	ARS00300	17.00	20	41.10	23.80	3.52	1.68	134.00	R13TSS		36.73		MODRES	CL		57.93	27M0F8W		70	P	
AUS	AUS00500	152.00	20	133.90	-18.40	2.82	1.74	105.00	R13TSS		37.53		MODRES	CL		59.43	27M0F8W			P	
AUT	AUT01600	-19.00	20	12.20	47.50	1.14	0.63	166.00	R13TSS		45.88		MODRES	CL		59.28	27M0F8W			P	
AZE	AZE06400	23.00	20	47.47	40.14	0.93	0.60	158.14	R13TSS		46.98		MODRES	CR		58.88	27M0F8W			P	5
BGD	BGD22000	74.00	20	90.30	23.60	1.46	0.84	135.00	R13TSS		43.56		MODRES	CR		58.66	27M0F8W			P	
BUL	BUL02000	-1.00	20	25.00	43.00	1.04	0.60	165.00	R13TSS		46.50		MODRES	CR		58.90	27M0F8W			P	
CBG	CBG29900	68.00	20	105.00	12.70	1.01	0.90	110.00	R13TSS		44.86		MODRES	CR		59.26	27M0F8W			P	
CHN	CHN15900	79.80	20	109.40	27.30	2.14	1.72	107.00	R13TSS		38.79		MODRES	CL		59.59	27M0F8W			P	
CHN	CHN18400	62.00	20	101.00	37.90	2.78	0.82	144.00	R13TSS		40.87		MODRES	CR		58.67	27M0F8W			P	
DNK	DNK08901	5.00	20	12.30	57.10	1.20	0.60	177.00	R13TSS		45.87		MODRES	CL		59.37	27M0F8W		29	P	
EGY	EGY02600	-7.00	20	29.70	26.80	2.33	1.72	136.00	R13TSS		38.42		MODRES	CL		58.32	27M0F8W			P	
F	F2_A2744	-7.00	20	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2784	-7.00	20	3.40	45.60	2.00	0.95	155.00	R13TSS		42.70		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2784	-7.00	20	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3384	-7.00	20	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2784	-7.00	20	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	55.20	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3384	-7.00	20	3.40	45.60	2.00	0.95	155.00	RAD_TSS		42.70		MODRES	LE	158.00	54.70	33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA2	29.00	20	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	20	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	20	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	20	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	20	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	20	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F /EUT	E2WA7DG2	29.00	20	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
G	G 02700	-33.50	20	-3.50	53.80	1.84	0.72	142.00	R13TSS		43.23		MODRES	CR		60.23	27M0F8W			P	7
IND	IND04101	56.00	20	78.40	16.00	2.08	1.38	35.00	R13TSS		39.87		MODRES	CL		58.77	27M0F8W			P	
IND	IND04200	68.00	20	79.30	27.70	2.14	1.16	147.00	R13TSS		40.50		MODRES	CL		58.80	27M0F8W			P	
INS	INS03000	80.20	20	112.30	-8.10	3.14	1.46	169.00	R13TSS		37.83		MODRES	CR		59.23	27M0F8W			P	
KRE	KRE28600	110.00	20	127.00	39.10	1.30	1.10	31.00	R13TSS		42.89		MODRES	CL		58.99	27M0F8W			P	
MDA	MDA06300	38.00	20	28.41	46.99	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5
MLA	MLA22700	86.00	20	102.10	4.10	1.62	0.82	135.00	R13TSS		43.21		MODRES	CR		58.31	27M0F8W			P	
MLI	MLI32800	-37.00	20	-7.60	13.20	1.74	1.24	171.00	R13TSS		41.11		MODRES	CR		58.91	27M0F8W			P	
MLT	MLT1470A	-13.00	20	14.30	35.90	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		56.18	27M0F8W			P	5, 7
MOZ	MOZ30700	-1.00	20	34.00	-18.00	3.57	1.38	55.00	R13TSS		37.52		MODRES	CL		59.42	27M0F8W			P	
NZL	TKL05800	158.00	20	-171.80	-8.90	0.70	0.60	35.00	R13TSS		48.21		MODRES	CR		58.81	27M0F8W		1	P	
NZL	TKL05801	158.00	20	-171.80	-8.90	0.70	0.60	35.00	R13TSS		48.21		MODRES	CR		58.81	27M0F8W		1	P	
PAK	PAK28200	38.00	20	68.50	25.80	1.32	0.62	133.00	R13TSS		45.32		MODRES	CR		58.32	27M0F8W			P	
PHL	PHL28500	98.00	20	121.30	11.10	3.46	1.76	99.00	R13TSS		36.60		MODRES	CL		58.70	27M0F8W			P	
PLW	PLW00000	146.00	20	132.99	5.52	1.29	0.60	55.84	R13TSS		45.55		MODRES	CR		58.85	27M0F8W			P	7
RRW	RRW31000	11.00	20	30.00	-2.10	0.66	0.60	42.00	R13TSS		48.47		MODRES	CL		59.97	27M0F8W			P	
S	SIRIUS03	5.20	20	14.00	63.00	1.30	0.70	142.00	R13TSS		42.50		R13RES	CR		58.00	27M0F8W	SIRIUS	29	AE	
STP	STP24100	-13.00	20	7.00	0.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		56.68	27M0F8W			P	
SVN	SVN14800	34.00	20	15.01	46.18	0.60	0.60	90.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W			P	5
ZAI	ZAI32200	-19.00	20	22.40	0.00	2.16	1.88	48.00	R13TSS		38.36		MODRES	CR		59.86	27M0F8W			P	
AFS	AFS02100	5.00	21	24.50	-28.00	3.13	1.68	27.00	R13TSS		37.24		MODRES	CL		59.14	27M0F8W			P	
AUS	AUS00900	164.00	21	147.50	-32.10	2.31	1.43	187.00	R13TSS		39.25		MODRES	CR		59.25	27M0F8W		78	P	
AUS	AUS0090A	164.00	21	159.06	-31.52	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		78	P	7
AUS	AUS0090B	164.00	21	167.93	-29.02	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		78	P	7
BEL	BEL01800	-19.00	21	4.60	50.60	0.82	0.60	167.00	R13TSS		47.53		MODRES	CR		59.23	27M0F8W			P	
BFA	BFA10700	-30.00	21	-1.50	12.20	1.45	1.14	29.00	R13TSS		42.26		MODRES	CR		58.96	27M0F8W			P	7
BRM	BRM29800	74.00	21	97.10	19.10	3.58	1.48	104.00	R13TSS		37.21		MODRES	CL		58.91	27M0F8W			P	
CHN	CHN17500	92.00	21	121.40	23.80	1.14	0.82	64.00	R13TSS		44.74		MODRES	CL		59.34	27M0F8W			P	
CHN	CHN17600	79.80	21	113.70	33.90	1.20	0.80	141.00	R13TSS		44.62		MODRES	CR		59.32	27M0F8W			P	
CYP	CYP08600	5.00	21	33.30	35.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.58	27M0F8W			P	
D	D2-21600	-1.00	21	12.60	52.10	0.83	0.63	172.00	R13TSS		47.26		MODRES	CL		59.16	27M0F8W			P	
DJI	DJI09900	23.00	21	42.50	11.60	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.48	27M0F8W			P	
F /EUT	E2WA7DA1	29.00	21	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	21	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	21	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	21	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	21	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	21	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F /EUT	E2WA7DG1	29.00	21	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
IND	IND03800	56.00	21	75.90	33.40	1.52	1.08	33.00	R13TSS		42.29		MODRES	CR		59.39	27M0F8W			P	
IND	IND04601	68.00	21	84.70	20.50	1.60	0.86	30.00	R13TSS		43.06		MODRES	CR		58.66	27M0F8W			P	
INS	INS03200	80.20	21	112.30	-0.30	2.66	2.32	109.00	R13TSS		36.54		MODRES	CL		59.14	27M0F8W			P	
ISL	ISL04900	-33.50	21	-19.00	64.90	1.00	0.60	177.00	R13TSS		46.67		MODRES	CL		60.77	27M0F8W			P	7
ISR	ISR1100A	-13.00	21	34.90	31.40	0.94	0.60	117.00	R13TSS		46.93		MODRES	CL		58.83	27M0F8W			P	5, 7
KEN	KEN24900	11.00	21	37.90	1.10	2.29	1.56	94.00	R13TSS		38.92		MODRES	CR		58.72	27M0F8W			P	
LVA	LVA06100	23.00	21	24.53	56.20	0.83	0.60	0.05	R13TSS		47.50		MODRES	CL		58.90	27M0F8W			P	5
MCO	MCO11600	-37.00	21	7.40	43.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.38	27M0F8W			P	
MRC	MRC20900	-25.00	21	-9.00	29.20	2.72	1.47	43.00	R13TSS		38.43		MODRES	CL		58.33	27M0F8W			P	
NMB	NMB0250A	-19.00	21	17.50	-21.60	2.66	1.90	48.00	R13TSS		37.41		MODRES	CL		59.71	27M0F8W			P	5
NPL	NPL12200	50.00	21	83.70	28.30	1.72	0.60	163.00	R13TSS		44.31		MODRES	CL		59.61	27M0F8W			P	
NZL	NZL28700	128.00	21	173.00	-41.00	3.30	1.28	48.00	R13TSS		38.19		MODRES	CR		59.89	27M0F8W			P	
POR	AZR13400	-30.00	21	-23.40	36.10	2.56	0.70	158.00	R13TSS		41.91		MODRES	CL		58.01	27M0F8W		21	P	7
POR	POR13300	-30.00	21	-8.00	39.60	0.92	0.60	112.00	R13TSS		47.03		MODRES	CL		58.43	27M0F8W		21	P	5, 7
SEN	SEN22201	-37.00	21	-14.40	13.80	1.46	1.04	139.00	R13TSS		42.63		MODRES	CL		58.63	27M0F8W			P	
UAE	UAE27400	17.00	21	53.60	24.20	0.98	0.80	162.00	R13TSS		45.50		MODRES	CR		58.20	27M0F8W			P	1
ALB	ALB29600	-7.00	22	19.80	41.30	0.68	0.60	146.00	R13TSS		48.34		MODRES	CL		58.84	27M0F8W			P	
AUS	AUS00600	152.00	22	136.60	-30.90	2.41	1.52	161.00	R13TSS		38.80		MODRES	CL		58.40	27M0F8W			P	
AUS	AUS00800	164.00	22	145.90	-21.70	3.62	1.63	136.00	R13TSS		36.73		MODRES	CL		58.83	27M0F8W			P	
BDI	BDI27000	11.00	22	29.90	-3.10	0.71	0.60	80.00	R13TSS		48.15		MODRES	CL		58.35	27M0F8W			P	
BGD	BGD22000	74.00	22	90.30	23.60	1.46	0.84	135.00	R13TSS		43.56		MODRES	CR		58.76	27M0F8W			P	
CBG	CBG29900	68.00	22	105.00	12.70	1.01	0.90	110.00	R13TSS		44.86		MODRES	CR		59.26	27M0F8W			P	
CHN	CHN15900	79.80	22	109.40	27.30	2.14	1.72	107.00	R13TSS		38.79		MODRES	CL		59.59	27M0F8W			P	
CHN	CHN16800	92.00	22	124.80	48.10	2.68	0.92	157.00	R13TSS		40.53		MODRES	CL		60.43	27M0F8W			P	
CHN	CHN18300	62.00	22	104.80	39.00	1.48	0.60	142.00	R13TSS		44.96		MODRES	CR		58.76	27M0F8W			P	
COG	COG23500	-13.00	22	14.60	-0.70	2.02	1.18	59.00	R13TSS		40.67		MODRES	CL		58.77	27M0F8W			P	
CTI	CTI23700	-30.00	22	-5.60	7.50	1.60	1.22	108.00	R13TSS		41.54		MODRES	CL		58.74	27M0F8W			P	7
ETH	ETH09200	23.00	22	39.55	8.58	2.48	1.92	128.32	R13TSS		37.67		MODRES	CL		58.87	27M0F8W			P	
F	REU09700	29.00	22	55.60	-19.20	1.56	0.78	96.00	R13TSS		43.59		MODRES	CR		58.89	27M0F8W		5	P	
F	REU09701	29.00	22	55.60	-19.20	1.56	0.78	96.00	R13TSS		43.59		MODRES	CR		58.89	27M0F8W		5	P	
F /EUT	E2WA7DA2	29.00	22	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	22	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	22	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	22	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	22	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	22	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	22	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
FIN	FIN10400	5.00	22	17.00	61.50	2.00	1.00	10.00	R13TSS		41.44		MODRES	CL		62.74	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
G	G UKDBS	-33.50	22	-3.50	53.80	1.84	0.72	142.00	R13TSS		43.20		MODRES	CR		60.10	27M0F8W	UKDBS-3		A	5, 7
GEO	GEO06400	23.00	22	43.35	42.27	1.11	0.60	161.21	R13TSS		46.23		MODRES	CR		58.93	27M0F8W			P	5
HNG	HNG10600	-1.00	22	19.50	47.20	0.92	0.60	176.00	R13TSS		47.03		MODRES	CR		59.03	27M0F8W			P	
IND	IND04101	56.00	22	78.40	16.00	2.08	1.38	35.00	R13TSS		39.87		MODRES	CL		58.77	27M0F8W			P	
IND	IND04200	68.00	22	79.30	27.70	2.14	1.16	147.00	R13TSS		40.50		MODRES	CL		58.80	27M0F8W			P	
INS	INS03000	80.20	22	112.30	-8.10	3.14	1.46	169.00	R13TSS		37.83		MODRES	CR		59.23	27M0F8W			P	
KGZ	KGZ07000	44.00	22	73.88	41.32	1.34	0.64	3.53	R13TSS		45.12		MODRES	CL		58.92	27M0F8W			P	
KRE	KRE28600	110.00	22	127.00	39.10	1.30	1.10	31.00	R13TSS		42.89		MODRES	CL		59.09	27M0F8W			P	
KWT	KWT11300	17.00	22	47.60	29.20	0.68	0.60	145.00	R13TSS		48.34		MODRES	CL		58.14	27M0F8W			P	
MLA	MLA22700	86.00	22	102.10	4.10	1.62	0.82	135.00	R13TSS		43.21		MODRES	CR		58.31	27M0F8W			P	
MTN	MTN22300	-37.00	22	-12.20	18.50	2.62	1.87	150.00	R13TSS		37.55		MODRES	CR		57.85	27M0F8W			P	
NIG	NIG11900	-19.00	22	7.80	9.40	2.16	2.02	45.00	R13TSS		38.05		MODRES	CR		58.95	27M0F8W			P	
PAK	PAK28100	38.00	22	65.20	27.90	1.52	1.42	28.00	R13TSS		41.11		MODRES	CR		58.11	27M0F8W			P	
PHL	PHL28500	98.00	22	121.30	11.10	3.46	1.76	99.00	R13TSS		36.60		MODRES	CL		58.70	27M0F8W			P	
SDN	SDN23100	-7.00	22	28.90	12.70	2.26	1.96	159.00	R13TSS		37.98		MODRES	CR		58.48	27M0F8W			P	
SUI	SUI14000	-19.00	22	8.20	46.60	0.98	0.70	171.00	R13TSS		46.08		MODRES	CL		59.08	27M0F8W			P	
SYR	SYR22900	11.00	22	38.30	34.90	1.04	0.90	7.00	R13TSS		44.73		MODRES	CR		58.23	27M0F8W			P	
TUN	TUN15000	-25.00	22	9.50	33.50	1.88	0.72	135.00	R13TSS		43.13		MODRES	CR		58.83	27M0F8W			P	
ZWE	ZWE13500	-1.00	22	29.60	-18.80	1.46	1.36	37.00	R13TSS		41.47		MODRES	CL		59.17	27M0F8W			P	
AGL	AGL29500	-13.00	23	16.50	-12.00	3.09	2.26	84.00	R13TSS		36.01		MODRES	CR		59.11	27M0F8W			P	
ARS	ARS34000	17.00	23	52.30	24.80	2.68	0.70	143.00	R13TSS		41.71		MODRES	CR		58.21	27M0F8W		71	P	
ARS	ARS34001	17.00	23	52.30	24.80	2.68	0.70	143.00	R13TSS		41.71		MODRES	CR		58.21	27M0F8W		71	P	
AUS	AUS00400	152.00	23	123.00	-24.20	3.06	2.17	102.00	R13TSS		36.22		MODRES	CR		58.22	27M0F8W		76	P	
AUS	AUS0040A	152.00	23	96.83	-12.19	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	
AUS	AUS0040B	152.00	23	105.69	-10.45	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	
AUS	AUS0040C	152.00	23	110.52	-66.28	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		76	P	
AUS	AUS00700	164.00	23	145.20	-38.10	2.12	1.02	147.00	R13TSS		41.09		MODRES	CR		58.49	27M0F8W		77	P	
AUS	AUS0070A	164.00	23	158.94	-54.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.88	27M0F8W		77	P	7
BHR	BHR2550A	17.00	23	50.50	26.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		55.78	27M0F8W		71	P	5
BRM	BRM29800	74.00	23	97.10	19.10	3.58	1.48	104.00	R13TSS		37.21		MODRES	CL		59.01	27M0F8W			P	
CHN	CHN15800	79.80	23	111.80	38.00	2.60	1.74	124.00	R13TSS		37.89		MODRES	CR		59.99	27M0F8W			P	
CVA	CVA08500	-37.00	23	10.80	41.50	2.00	0.60	138.00	R13TSS		43.66		MODRES	CR		58.56	27M0F8W			P	
CZE	CZE14400	17.00	23	15.50	49.79	0.92	0.60	174.55	R13TSS		47.02		MODRES	CL		58.92	27M0F8W			P	5
E	CNR13000	-30.00	23	-15.70	28.40	1.54	0.60	5.00	R13TSS		44.79		MODRES	CL		57.79	27M0F8W		17	P	
E	E 12900	-30.00	23	-3.10	39.90	2.10	1.14	154.00	R13TSS		40.66		MODRES	CL		58.86	27M0F8W		17	P	
E	HISPASA4	-30.00	23	-4.00	39.00					COP	39.80	5.50	R13RES	CL		57.60	27M0F8W	HISPASAT-1	17	AE	
E	HISPASA6	-30.00	23	-4.00	39.00					COP	39.80	5.50	R13RES	CL		57.60	27M0F8W	HISPASAT-1	17	AE	
ERI	ERI09200	23.00	23	39.41	14.98	1.67	0.95	145.48	R13TSS		42.44		MODRES	CR		58.94	27M0F8W			P	5
F /EUT	E2WA7DA1	29.00	23	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F /EUT	E2WA7DB1	29.00	23	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	23	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	23	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	23	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	23	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	23	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
GHA	GHA10800	-25.00	23	-1.20	7.90	1.48	1.06	102.00	R13TSS		42.49		MODRES	CR		58.59	27M0F8W			P	
GNE	GNE30300	-19.00	23	10.30	1.50	0.68	0.60	10.00	R13TSS		48.34		MODRES	CL		58.84	27M0F8W			P	
HOL	HOL21300	-19.00	23	5.40	52.00	0.76	0.60	171.00	R13TSS		47.86		MODRES	CR		59.36	27M0F8W			P	
IND	IND03801	56.00	23	75.90	33.40	1.52	1.08	33.00	R13TSS		42.29		MODRES	CR		59.39	27M0F8W			P	
IND	IND04600	68.00	23	84.70	20.50	1.60	0.86	30.00	R13TSS		43.06		MODRES	CR		58.66	27M0F8W			P	
INS	INS03200	80.20	23	112.30	-0.30	2.66	2.32	109.00	R13TSS		36.54		MODRES	CL		59.14	27M0F8W			P	
ISL	ISL05000	5.00	23	-19.50	61.00	2.20	0.80	4.00	R13TSS		41.99		MODRES	CR		61.29	27M0F8W			P	2
JOR	JOR22400	11.00	23	35.80	31.40	0.84	0.78	114.00	R13TSS		46.28		MODRES	CL		58.08	27M0F8W			P	
KIR	KIR00002	176.00	23	-157.78	-0.33	2.40	0.64	110.62	R13TSS		42.60		MODRES	CL		58.90	27M0F8W			P	5
NOR	BIFROS21	-0.80	23	17.00	61.50					NO9	32.00	6.00	MODRES	CL		54.50	27M0FXF	BIFROST-2		A	
NPL	NPL1220A	50.00	23	83.70	28.30	1.72	0.60	163.00	R13TSS		44.31		MODRES	CL		59.61	27M0F8W			P	5
NZL	NIU05400	158.00	23	-169.80	-19.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		59.08	27M0F8W		2	P	
NZL	NIU05401	158.00	23	-169.80	-19.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	CL		59.08	27M0F8W		2	P	
SDN	SDN23000	-7.00	23	29.20	7.50	2.34	1.12	148.00	R13TSS		40.26		MODRES	CL		59.36	27M0F8W			P	
SRL	SRL25900	-33.50	23	-11.80	8.60	0.78	0.68	114.00	R13TSS		47.20		MODRES	CR		58.40	27M0F8W			P	7
TKM	TKM06800	44.00	23	59.18	38.84	2.25	0.99	164.51	R13TSS		40.94		MODRES	CR		58.94	27M0F8W			P	5
TZA	TZA22500	11.00	23	34.60	-6.20	2.41	1.72	129.00	R13TSS		38.27		MODRES	CR		58.67	27M0F8W			P	
YUG	YUG14800	-7.00	23	20.50	43.98	0.91	0.60	145.16	R13TSS		47.07		MODRES	CR		58.87	27M0F8W			P	
ARM	ARM06400	23.00	24	44.99	39.95	0.73	0.60	148.17	R13TSS		48.02		MODRES	CR		58.92	27M0F8W			P	5
AUS	AUS00500	152.00	24	133.90	-18.40	2.82	1.74	105.00	R13TSS		37.53		MODRES	CL		59.43	27M0F8W			P	
BGD	BGD22000	74.00	24	90.30	23.60	1.46	0.84	135.00	R13TSS		43.56		MODRES	CR		58.76	27M0F8W			P	
CAF	CAF25800	-13.00	24	21.00	6.30	2.25	1.68	31.00	R13TSS		38.67		MODRES	CL		59.27	27M0F8W			P	
CBG	CBG29900	68.00	24	105.00	12.70	1.01	0.90	110.00	R13TSS		44.86		MODRES	CR		59.26	27M0F8W			P	
CHN	CHN16600	92.00	24	121.10	41.70	1.52	0.78	154.00	R13TSS		43.71		MODRES	CL		59.51	27M0F8W			P	
CHN	CHN17700	79.80	24	111.80	30.80	1.42	0.82	160.00	R13TSS		43.79		MODRES	CL		59.69	27M0F8W			P	
CHN	CHN18800	62.00	24	101.50	25.10	1.86	1.08	132.00	R13TSS		41.42		MODRES	CL		60.02	27M0F8W			P	
CPV	CPV30100	-30.00	24	-24.00	16.00	0.86	0.70	144.00	R13TSS		46.65		MODRES	CL		57.15	27M0F8W			P	5, 7
DNK	DNK09000	5.00	24	17.00	61.50	2.00	1.00	10.00	R13TSS		41.44		MODRES	CL		62.54	27M0F8W			P	
F	F2_A2788	-7.00	24	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2728	-7.00	24	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2788	-7.00	24	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2728	-7.00	24	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A2788	-7.00	24	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F	F3_A3328	-7.00	24	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_A3388	-7.00	24	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2728	-7.00	24	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	55.50	27M0G9W	RADIOSAT-3	19	A	
F	F3_D2788	-7.00	24	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	55.50	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3328	-7.00	24	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	55.00	33M0G9W	RADIOSAT-3	19	A	
F	F3_D3388	-7.00	24	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	55.00	33M0G9W	RADIOSAT-3	19	A	
F	MYT09800	29.00	24	45.10	-12.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.38	27M0F8W		7	P	
F	MYT09801	29.00	24	45.10	-12.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.38	27M0F8W		7	P	
F /EUT	E2WA7DA2	29.00	24	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	24	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	24	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	24	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	24	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	24	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	24	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
I	I 08200	-19.00	24	12.30	41.30	2.38	0.98	137.00	R13TSS		40.77		MODRES	CL		59.07	27M0F8W			P	
IND	IND04100	56.00	24	78.40	16.00	2.08	1.38	35.00	R13TSS		39.87		MODRES	CL		58.87	27M0F8W			P	
IND	IND04201	68.00	24	79.30	27.70	2.14	1.16	147.00	R13TSS		40.50		MODRES	CL		58.90	27M0F8W			P	
INS	INS03000	80.20	24	112.30	-8.10	3.14	1.46	169.00	R13TSS		37.83		MODRES	CR		59.33	27M0F8W			P	
IRQ	IRQ25600	11.00	24	43.60	32.80	1.88	0.96	143.00	R13TSS		41.88		MODRES	CR		58.28	27M0F8W			P	1
KAZ	KAZ06600	44.00	24	64.72	46.40	4.31	1.70	172.22	R13TSS		35.79		MODRES	CL		58.89	27M0F8W			P	
LSO	LSO30500	5.00	24	27.80	-29.80	0.66	0.60	36.00	R13TSS		48.47		MODRES	CR		59.17	27M0F8W			P	
MLA	MLA22700	86.00	24	102.10	4.10	1.62	0.82	135.00	R13TSS		43.21		MODRES	CR		58.41	27M0F8W			P	
MTN	MTN28800	-37.00	24	-7.80	23.40	1.63	1.10	141.00	R13TSS		41.91		MODRES	CR		58.01	27M0F8W			P	
MWI	MWI30800	-1.00	24	34.10	-13.00	1.54	0.60	87.00	R13TSS		44.79		MODRES	CL		59.19	27M0F8W			P	
NGR	NGR11500	-25.00	24	8.30	16.80	2.54	2.08	44.00	R13TSS		37.22		MODRES	CL		59.52	27M0F8W			P	
NOR	BIFROS22	-0.80	24	17.00	61.50					NO9	32.00	6.00	MODRES	CR		54.50	27M0FXF	BIFROST-2		A	
NZL	TKL05800	158.00	24	-171.80	-8.90	0.70	0.60	35.00	R13TSS		48.21		MODRES	CR		58.91	27M0F8W		1	P	
NZL	TKL05801	158.00	24	-171.80	-8.90	0.70	0.60	35.00	R13TSS		48.21		MODRES	CR		58.91	27M0F8W		1	P	
OMA	OMA12300	17.00	24	55.60	21.00	1.88	1.02	100.00	R13TSS		41.62		MODRES	CL		58.32	27M0F8W			P	
PAK	PAK28200	38.00	24	68.50	25.80	1.32	0.62	133.00	R13TSS		45.32		MODRES	CR		58.42	27M0F8W			P	
PHL	PHL28500	98.00	24	121.30	11.10	3.46	1.76	99.00	R13TSS		36.60		MODRES	CL		58.80	27M0F8W			P	
SDN	SDN23200	-7.00	24	30.40	19.00	2.44	1.52	176.00	R13TSS		38.75		MODRES	CR		58.25	27M0F8W			P	
AFS	AFS02100	5.00	25	24.50	-28.00	3.13	1.68	27.00	R13TSS		37.24		MODRES	CL		59.14	27M0F8W			P	
BEL	BEL01800	-19.00	25	4.60	50.60	0.82	0.60	167.00	R13TSS		47.53		MODRES	CR		59.13	27M0F8W			P	
BFA	BFA10700	-30.00	25	-1.50	12.20	1.45	1.14	29.00	R13TSS		42.26		MODRES	CR		58.96	27M0F8W			P	7
CYP	CYP08600	5.00	25	33.30	35.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.58	27M0F8W			P	
D	D2-21600	-1.00	25	12.60	52.10	0.83	0.63	172.00	R13TSS		47.26		MODRES	CL		59.26	27M0F8W			P	
DJI	DJI09900	23.00	25	42.50	11.60	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.58	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F /EUT	E2WA7DA1	29.00	25	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	25	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	25	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	25	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	25	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	25	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	25	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
ISL	ISL04900	-33.50	25	-19.00	64.90	1.00	0.60	177.00	R13TSS		46.67		MODRES	CL		60.87	27M0F8W			P	7
ISR	ISR11000	-13.00	25	34.90	31.40	0.94	0.60	117.00	R13TSS		46.93		MODRES	CL		58.83	27M0F8W			P	
KEN	KEN24900	11.00	25	37.90	1.10	2.29	1.56	94.00	R13TSS		38.92		MODRES	CR		58.82	27M0F8W			P	
LVA	LVA06100	23.00	25	24.53	56.20	0.83	0.60	0.05	R13TSS		47.50		MODRES	CL		58.90	27M0F8W			P	5
MCO	MCO11600	-37.00	25	7.40	43.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.48	27M0F8W			P	
MNG	MNG24800	74.00	25	102.20	46.60	3.60	1.13	169.00	R13TSS		38.35		MODRES	CR		59.05	27M0F8W			P	
MRC	MRC20900	-25.00	25	-9.00	29.20	2.72	1.47	43.00	R13TSS		38.43		MODRES	CL		58.33	27M0F8W			P	
NMB	NMB02500	-19.00	25	17.50	-21.60	2.66	1.90	48.00	R13TSS		37.41		MODRES	CL		59.71	27M0F8W			P	
POR	AZR13400	-30.00	25	-23.40	36.10	2.56	0.70	158.00	R13TSS		41.91		MODRES	CL		58.11	27M0F8W		21	P	7
POR	POR13300	-30.00	25	-8.00	39.60	0.92	0.60	112.00	R13TSS		47.03		MODRES	CL		58.43	27M0F8W		21	P	5, 7
RUS	RSTRSA11	36.00	25	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	25	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	25	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	25	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	25	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	25	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	25	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	25	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-5	42	P	
RUS	RUS00400	110.00	25	127.76	57.81	3.59	1.65	165.75	R13TSS		36.73		MODRES	CL		58.93	27M0F8W			P	5, 7
SEN	SEN22201	-37.00	25	-14.40	13.80	1.46	1.04	139.00	R13TSS		42.63		MODRES	CL		58.73	27M0F8W			P	
UAE	UAE27400	17.00	25	53.60	24.20	0.98	0.80	162.00	R13TSS		45.50		MODRES	CR		58.20	27M0F8W			P	
ALB	ALB29600	-7.00	26	19.80	41.30	0.68	0.60	146.00	R13TSS		48.34		MODRES	CL		58.84	27M0F8W			P	
BDI	BDI27000	11.00	26	29.90	-3.10	0.71	0.60	80.00	R13TSS		48.15		MODRES	CL		58.35	27M0F8W			P	
COG	COG23500	-13.00	26	14.60	-0.70	2.02	1.18	59.00	R13TSS		40.67		MODRES	CL		58.77	27M0F8W			P	
CTI	CTI23700	-30.00	26	-5.60	7.50	1.60	1.22	108.00	R13TSS		41.54		MODRES	CL		58.74	27M0F8W			P	
ETH	ETH09200	23.00	26	39.55	8.58	2.48	1.92	128.32	R13TSS		37.67		MODRES	CL		58.87	27M0F8W			P	
F	REU09700	29.00	26	55.60	-19.20	1.56	0.78	96.00	R13TSS		43.59		MODRES	CR		58.99	27M0F8W		5	P	
F	REU09701	29.00	26	55.60	-19.20	1.56	0.78	96.00	R13TSS		43.59		MODRES	CR		58.99	27M0F8W		5	P	
F /EUT	E2WA7DA2	29.00	26	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	26	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	26	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	26	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F /EUT	E2WA7DE2	29.00	26	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	26	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	26	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
FIN	FIN10400	5.00	26	17.00	61.50	2.00	1.00	10.00	R13TSS		41.44		MODRES	CL		62.54	27M0F8W			P	
G	G UKDBS	-33.50	26	-3.50	53.80	1.84	0.72	142.00	R13TSS		43.20		MODRES	CR		60.10	27M0F8W	UKDBS-3		A	5, 7
GEO	GEO06400	23.00	26	43.35	42.27	1.11	0.60	161.21	R13TSS		46.23		MODRES	CR		58.93	27M0F8W			P	5, 7
HNG	HNG10600	-1.00	26	19.50	47.20	0.92	0.60	176.00	R13TSS		47.03		MODRES	CR		59.03	27M0F8W			P	
KGZ	KGZ07000	44.00	26	73.88	41.32	1.34	0.64	3.53	R13TSS		45.12		MODRES	CL		58.92	27M0F8W			P	5, 7
KWT	KWT11300	17.00	26	47.60	29.20	0.68	0.60	145.00	R13TSS		48.34		MODRES	CL		58.14	27M0F8W			P	
MTN	MTN22300	-37.00	26	-12.20	18.50	2.62	1.87	150.00	R13TSS		37.55		MODRES	CR		57.95	27M0F8W			P	
NIG	NIG11900	-19.00	26	7.80	9.40	2.16	2.02	45.00	R13TSS		38.05		MODRES	CR		58.95	27M0F8W			P	
RUS	RSTRSA12	36.00	26	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	26	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	26	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	26	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	26	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	26	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	26	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	26	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-5	42	P	
SDN	SDN23100	-7.00	26	28.90	12.70	2.26	1.96	159.00	R13TSS		37.98		MODRES	CR		58.48	27M0F8W			P	
SUI	SUI14000	-19.00	26	8.20	46.60	0.98	0.70	171.00	R13TSS		46.08		MODRES	CL		59.08	27M0F8W			P	
SYR	SYR22900	11.00	26	38.30	34.90	1.04	0.90	7.00	R13TSS		44.73		MODRES	CR		58.33	27M0F8W			P	
TUN	TUN15000	-25.00	26	9.50	33.50	1.88	0.72	135.00	R13TSS		43.13		MODRES	CR		58.93	27M0F8W			P	
ZWE	ZWE13500	-1.00	26	29.60	-18.80	1.46	1.36	37.00	R13TSS		41.47		MODRES	CL		59.17	27M0F8W			P	
AGL	AGL29500	-13.00	27	16.50	-12.00	3.09	2.26	84.00	R13TSS		36.01		MODRES	CR		59.21	27M0F8W			P	
BHR	BHR25500	17.00	27	50.50	26.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		55.78	27M0F8W			P	
CVA	CVA08300	-37.00	27	12.40	41.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		60.18	27M0F8W			P	
CZE	CZE14400	17.00	27	15.50	49.79	0.92	0.60	174.55	R13TSS		47.02		MODRES	CL		58.92	27M0F8W			P	5
DNK	DNK09100	5.00	27	-19.50	61.00	2.20	0.80	4.00	R13TSS		41.99		MODRES	CR		61.19	27M0F8W			P	2
E	CNR13000	-30.00	27	-15.70	28.40	1.54	0.60	5.00	R13TSS		44.79		MODRES	CL		57.79	27M0F8W		17	P	
E	E 12900	-30.00	27	-3.10	39.90	2.10	1.14	154.00	R13TSS		40.66		MODRES	CL		58.96	27M0F8W		17	P	
E	HISPASA4	-30.00	27	-4.00	39.00					COP	39.80	5.50	R13RES	CL		57.60	27M0F8W	HISPASAT-1	17	AE	
E	HISPASA6	-30.00	27	-4.00	39.00					COP	39.80	5.50	R13RES	CL		57.60	27M0F8W	HISPASAT-1	17	AE	
ERI	ERI09200	23.00	27	39.41	14.98	1.67	0.95	145.48	R13TSS		42.44		MODRES	CR		58.94	27M0F8W			P	5
F /EUT	E2WA7DA1	29.00	27	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	27	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	27	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	27	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	27	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F /EUT	E2WA7DF1	29.00	27	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	27	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
GHA	GHA10800	-25.00	27	-1.20	7.90	1.48	1.06	102.00	R13TSS		42.49		MODRES	CR		58.69	27M0F8W			P	
GNE	GNE30300	-19.00	27	10.30	1.50	0.68	0.60	10.00	R13TSS		48.34		MODRES	CL		58.84	27M0F8W			P	
HOL	HOL21300	-19.00	27	5.40	52.00	0.76	0.60	171.00	R13TSS		47.86		MODRES	CR		59.46	27M0F8W			P	
JOR	JOR22400	11.00	27	35.80	31.40	0.84	0.78	114.00	R13TSS		46.28		MODRES	CL		58.08	27M0F8W			P	
NOR	BIFROS21	-0.80	27	17.00	61.50					NO9	32.00	6.00	MODRES	CL		54.50	27M0FXF	BIFROST-2		A	
RUS	RSTRSA11	36.00	27	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	27	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	27	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	27	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	27	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	27	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	27	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	27	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-5	42	P	
RUS	RUS00400	110.00	27	127.76	57.81	3.59	1.65	165.75	R13TSS		36.73		MODRES	CL		58.93	27M0F8W			P	5, 7
SDN	SDN23000	-7.00	27	29.20	7.50	2.34	1.12	148.00	R13TSS		40.26		MODRES	CL		59.46	27M0F8W			P	
SRL	SRL25900	-33.50	27	-11.80	8.60	0.78	0.68	114.00	R13TSS		47.20		MODRES	CR		58.50	27M0F8W			P	6
TKM	TKM06800	44.00	27	59.18	38.84	2.25	0.99	164.51	R13TSS		40.94		MODRES	CR		58.94	27M0F8W			P	5
TZA	TZA22500	11.00	27	34.60	-6.20	2.41	1.72	129.00	R13TSS		38.27		MODRES	CR		58.77	27M0F8W			P	
YUG	YUG14800	-7.00	27	20.50	43.98	0.91	0.60	145.16	R13TSS		47.07		MODRES	CR		58.87	27M0F8W			P	
ARM	ARM06400	23.00	28	44.99	39.95	0.73	0.60	148.17	R13TSS		48.02		MODRES	CR		58.92	27M0F8W			P	5, 7
CAF	CAF25800	-13.00	28	21.00	6.30	2.25	1.68	31.00	R13TSS		38.67		MODRES	CL		59.27	27M0F8W			P	
CPV	CPV30100	-30.00	28	-24.00	16.00	0.86	0.70	144.00	R13TSS		46.65		MODRES	CL		57.15	27M0F8W			P	
F	F2_A2788	-7.00	28	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2728	-7.00	28	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2788	-7.00	28	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2728	-7.00	28	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A2788	-7.00	28	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3328	-7.00	28	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_A3388	-7.00	28	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2728	-7.00	28	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	55.40	27M0G9W	RADIOSAT-3	19	A	
F	F3_D2788	-7.00	28	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	55.40	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3328	-7.00	28	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	54.80	33M0G9W	RADIOSAT-3	19	A	
F	F3_D3388	-7.00	28	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	54.80	33M0G9W	RADIOSAT-3	19	A	
F	MYT09800	29.00	28	45.10	-12.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.48	27M0F8W		7	P	
F	MYT09801	29.00	28	45.10	-12.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.48	27M0F8W		7	P	
F /EUT	E2WA7DA2	29.00	28	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	28	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F /EUT	E2WA7DC2	29.00	28	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	28	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	28	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	28	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	28	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
I	I 08200	-19.00	28	12.30	41.30	2.38	0.98	137.00	R13TSS		40.77		MODRES	CL		59.17	27M0F8W			P	
IRQ	IRQ25600	11.00	28	43.60	32.80	1.88	0.96	143.00	R13TSS		41.88		MODRES	CR		58.38	27M0F8W			P	
KAZ	KAZ06600	44.00	28	64.72	46.40	4.31	1.70	172.22	R13TSS		35.79		MODRES	CL		58.89	27M0F8W			P	7
LSO	LSO30500	5.00	28	27.80	-29.80	0.66	0.60	36.00	R13TSS		48.47		MODRES	CR		59.17	27M0F8W			P	
MTN	MTN28800	-37.00	28	-7.80	23.40	1.63	1.10	141.00	R13TSS		41.91		MODRES	CR		58.01	27M0F8W			P	
MWI	MWI30800	-1.00	28	34.10	-13.00	1.54	0.60	87.00	R13TSS		44.79		MODRES	CL		59.29	27M0F8W			P	
NGR	NGR11500	-25.00	28	8.30	16.80	2.54	2.08	44.00	R13TSS		37.22		MODRES	CL		59.52	27M0F8W			P	
NOR	BIFROS22	-0.80	28	17.00	61.50					NO9	32.00	6.00	MODRES	CR		54.50	27M0FXF	BIFROST-2		A	
NOR	NOR12101	5.00	28	17.00	61.50	2.00	1.00	10.00	R13TSS		41.44		MODRES	CL		61.84	27M0F8W			P	
OMA	OMA12300	17.00	28	55.60	21.00	1.88	1.02	100.00	R13TSS		41.62		MODRES	CL		58.32	27M0F8W			P	
RUS	RSTRSA12	36.00	28	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	28	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	28	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	28	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	28	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	28	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	28	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	28	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-5	42	P	
SDN	SDN23200	-7.00	28	30.40	19.00	2.44	1.52	176.00	R13TSS		38.75		MODRES	CR		58.25	27M0F8W			P	
AFS	AFS02100	5.00	29	24.50	-28.00	3.13	1.68	27.00	R13TSS		37.24		MODRES	CL		59.24	27M0F8W			P	
BEL	BEL01800	-19.00	29	4.60	50.60	0.82	0.60	167.00	R13TSS		47.53		MODRES	CR		58.53	27M0F8W			P	
BFA	BFA10700	-30.00	29	-1.50	12.20	1.45	1.14	29.00	R13TSS		42.26		MODRES	CR		59.06	27M0F8W			P	
CYP	CYP08600	5.00	29	33.30	35.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.68	27M0F8W			P	
D	D2-21600	-1.00	29	12.60	52.10	0.83	0.63	172.00	R13TSS		47.26		MODRES	CL		59.26	27M0F8W			P	
DJI	DJI09900	23.00	29	42.50	11.60	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.58	27M0F8W			P	
F /EUT	E2WA7DA1	29.00	29	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	29	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	29	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	29	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	29	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	29	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	29	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
ISL	ISL04900	-33.50	29	-19.00	64.90	1.00	0.60	177.00	R13TSS		46.67		MODRES	CL		60.87	27M0F8W			P	5, 6
ISR	ISR11000	-13.00	29	34.90	31.40	0.94	0.60	117.00	R13TSS		46.93		MODRES	CL		58.93	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
KEN	KEN24900	11.00	29	37.90	1.10	2.29	1.56	94.00	R13TSS		38.92		MODRES	CR		58.82	27M0F8W			P	
LVA	LVA06100	23.00	29	24.53	56.20	0.83	0.60	0.05	R13TSS		47.50		MODRES	CL		58.90	27M0F8W			P	5
MCO	MCO11600	-37.00	29	7.40	43.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.48	27M0F8W			P	
MNG	MNG24800	74.00	29	102.20	46.60	3.60	1.13	169.00	R13TSS		38.35		MODRES	CR		59.15	27M0F8W			P	
MRC	MRC20900	-25.00	29	-9.00	29.20	2.72	1.47	43.00	R13TSS		38.43		MODRES	CL		58.43	27M0F8W			P	
NMB	NMB02500	-19.00	29	17.50	-21.60	2.66	1.90	48.00	R13TSS		37.41		MODRES	CL		59.81	27M0F8W			P	
POR	AZR13400	-30.00	29	-23.40	36.10	2.56	0.70	158.00	R13TSS		41.91		MODRES	CL		58.11	27M0F8W		21	P	
POR	POR13300	-30.00	29	-8.00	39.60	0.92	0.60	112.00	R13TSS		47.03		MODRES	CL		58.53	27M0F8W		21	P	5
RUS	RSTRSA11	36.00	29	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	29	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	29	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	29	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	29	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	29	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	29	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	29	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-5	42	P	
SEN	SEN22200	-37.00	29	-14.40	13.80	1.46	1.04	139.00	R13TSS		42.63		MODRES	CL		58.73	27M0F8W			P	
UAE	UAE27400	17.00	29	53.60	24.20	0.98	0.80	162.00	R13TSS		45.50		MODRES	CR		58.30	27M0F8W			P	
ALB	ALB29600	-7.00	30	19.80	41.30	0.68	0.60	146.00	R13TSS		48.34		MODRES	CL		58.94	27M0F8W			P	
BDI	BDI27000	11.00	30	29.90	-3.10	0.71	0.60	80.00	R13TSS		48.15		MODRES	CL		58.45	27M0F8W			P	
COG	COG23500	-13.00	30	14.60	-0.70	2.02	1.18	59.00	R13TSS		40.67		MODRES	CL		58.87	27M0F8W			P	
CTI	CTI23700	-30.00	30	-5.60	7.50	1.60	1.22	108.00	R13TSS		41.54		MODRES	CL		58.84	27M0F8W			P	
ETH	ETH09200	23.00	30	39.55	8.58	2.48	1.92	128.32	R13TSS		37.67		MODRES	CL		58.87	27M0F8W			P	
F	REU09700	29.00	30	55.60	-19.20	1.56	0.78	96.00	R13TSS		43.59		MODRES	CR		59.09	27M0F8W		5	P	
F	REU09701	29.00	30	55.60	-19.20	1.56	0.78	96.00	R13TSS		43.59		MODRES	CR		59.09	27M0F8W		5	P	
F /EUT	E2WA7DA2	29.00	30	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	30	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	30	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	30	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	30	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	30	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	30	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
G	G UKDBS	-33.50	30	-3.50	53.80	1.84	0.72	142.00	R13TSS		43.20		MODRES	CR		60.10	27M0F8W	UKDBS-3		A	5, 6
GEO	GEO06400	23.00	30	43.35	42.27	1.11	0.60	161.21	R13TSS		46.23		MODRES	CR		58.93	27M0F8W			P	5, 7
HNG	HNG10600	-1.00	30	19.50	47.20	0.92	0.60	176.00	R13TSS		47.03		MODRES	CR		59.13	27M0F8W			P	
KGZ	KGZ07000	44.00	30	73.88	41.32	1.34	0.64	3.53	R13TSS		45.12		MODRES	CL		58.92	27M0F8W			P	5, 7
KWT	KWT11300	17.00	30	47.60	29.20	0.68	0.60	145.00	R13TSS		48.34		MODRES	CL		58.24	27M0F8W			P	
MTN	MTN22300	-37.00	30	-12.20	18.50	2.62	1.87	150.00	R13TSS		37.55		MODRES	CR		57.95	27M0F8W			P	
NIG	NIG11900	-19.00	30	7.80	9.40	2.16	2.02	45.00	R13TSS		38.05		MODRES	CR		59.05	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
RUS	RSTRSA12	36.00	30	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	30	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	30	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	30	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	30	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	30	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	30	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	30	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-5	42	P	
S	S 13900	5.00	30	17.00	61.50	2.00	1.00	10.00	R13TSS		41.44		MODRES	CL		62.14	27M0F8W			P	
SDN	SDN23100	-7.00	30	28.90	12.70	2.26	1.96	159.00	R13TSS		37.98		MODRES	CR		58.58	27M0F8W			P	
SUI	SUI14000	-19.00	30	8.20	46.60	0.98	0.70	171.00	R13TSS		46.08		MODRES	CL		59.18	27M0F8W			P	
SYR	SYR22900	11.00	30	38.30	34.90	1.04	0.90	7.00	R13TSS		44.73		MODRES	CR		58.33	27M0F8W			P	
TUN	TUN15000	-25.00	30	9.50	33.50	1.88	0.72	135.00	R13TSS		43.13		MODRES	CR		58.93	27M0F8W			P	
ZWE	ZWE13500	-1.00	30	29.60	-18.80	1.46	1.36	37.00	R13TSS		41.47		MODRES	CL		59.27	27M0F8W			P	
AGL	AGL29500	-13.00	31	16.50	-12.00	3.09	2.26	84.00	R13TSS		36.01		MODRES	CR		59.21	27M0F8W			P	
BHR	BHR25500	17.00	31	50.50	26.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		55.88	27M0F8W			P	
CVA	CVA08300	-37.00	31	12.40	41.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		60.28	27M0F8W			P	
CZE	CZE14400	17.00	31	15.50	49.79	0.92	0.60	174.55	R13TSS		47.02		MODRES	CL		58.92	27M0F8W			P	5
E	CNR13000	-30.00	31	-15.70	28.40	1.54	0.60	5.00	R13TSS		44.79		MODRES	CL		57.89	27M0F8W		17	P	
E	E 12900	-30.00	31	-3.10	39.90	2.10	1.14	154.00	R13TSS		40.66		MODRES	CL		58.96	27M0F8W		17	P	
E	HISPASA4	-30.00	31	-4.00	39.00					COP	39.80	5.50	R13RES	CL		57.60	27M0F8W	HISPASAT-1	17	AE	
E	HISPASA6	-30.00	31	-4.00	39.00					COP	39.80	5.50	R13RES	CL		57.60	27M0F8W	HISPASAT-1	17	AE	
ERI	ERI09200	23.00	31	39.41	14.98	1.67	0.95	145.48	R13TSS		42.44		MODRES	CR		58.94	27M0F8W			P	5
F /EUT	E2WA7DA1	29.00	31	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	31	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	31	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	31	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	31	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	31	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	31	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
GHA	GHA10800	-25.00	31	-1.20	7.90	1.48	1.06	102.00	R13TSS		42.49		MODRES	CR		58.69	27M0F8W			P	
GNE	GNE30300	-19.00	31	10.30	1.50	0.68	0.60	10.00	R13TSS		48.34		MODRES	CL		58.94	27M0F8W			P	
HOL	HOL21300	-19.00	31	5.40	52.00	0.76	0.60	171.00	R13TSS		47.86		MODRES	CR		59.56	27M0F8W			P	
ISL	ISL05000	5.00	31	-19.50	61.00	2.20	0.80	4.00	R13TSS		41.99		MODRES	CR		61.39	27M0F8W			P	2
JOR	JOR22400	11.00	31	35.80	31.40	0.84	0.78	114.00	R13TSS		46.28		MODRES	CL		58.18	27M0F8W			P	
NOR	BIFROS21	-0.80	31	17.00	61.50					NO9	32.00	6.00	MODRES	CL		54.50	27M0FXF	BIFROST-2		A	
RUS	RSTRSA11	36.00	31	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	31	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	31	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-3	40	P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
RUS	RSTRSA51	140.00	31	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	31	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	31	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	31	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	31	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-5	42	P	
RUS	RUS00400	110.00	31	127.76	57.81	3.59	1.65	165.75	R13TSS		36.73		MODRES	CL		58.93	27M0F8W			P	5, 7
SDN	SDN23000	-7.00	31	29.20	7.50	2.34	1.12	148.00	R13TSS		40.26		MODRES	CL		59.46	27M0F8W			P	
SRL	SRL25900	-33.50	31	-11.80	8.60	0.78	0.68	114.00	R13TSS		47.20		MODRES	CR		58.60	27M0F8W			P	6
TKM	TKM06800	44.00	31	59.18	38.84	2.25	0.99	164.51	R13TSS		40.94		MODRES	CR		58.94	27M0F8W			P	5
TZA	TZA22500	11.00	31	34.60	-6.20	2.41	1.72	129.00	R13TSS		38.27		MODRES	CR		58.77	27M0F8W			P	
YUG	YUG14800	-7.00	31	20.50	43.98	0.91	0.60	145.16	R13TSS		47.07		MODRES	CR		58.87	27M0F8W			P	
ARM	ARM06400	23.00	32	44.99	39.95	0.73	0.60	148.17	R13TSS		48.02		MODRES	CR		58.92	27M0F8W			P	5, 7
CAF	CAF25800	-13.00	32	21.00	6.30	2.25	1.68	31.00	R13TSS		38.67		MODRES	CL		59.37	27M0F8W			P	
CPV	CPV30100	-30.00	32	-24.00	16.00	0.86	0.70	144.00	R13TSS		46.65		MODRES	CL		57.25	27M0F8W			P	
F	F2_A2788	-7.00	32	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2728	-7.00	32	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2788	-7.00	32	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2728	-7.00	32	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A2788	-7.00	32	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3328	-7.00	32	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_A3388	-7.00	32	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2728	-7.00	32	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	55.30	27M0G9W	RADIOSAT-3	19	A	
F	F3_D2788	-7.00	32	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	55.30	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3328	-7.00	32	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	54.80	33M0G9W	RADIOSAT-3	19	A	
F	F3_D3388	-7.00	32	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	54.80	33M0G9W	RADIOSAT-3	19	A	
F	MYT09800	29.00	32	45.10	-12.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.48	27M0F8W		7	P	
F	MYT09801	29.00	32	45.10	-12.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.48	27M0F8W		7	P	
F /EUT	E2WA7DA2	29.00	32	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	32	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	32	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	32	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	32	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	32	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	32	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
I	I 08200	-19.00	32	12.30	41.30	2.38	0.98	137.00	R13TSS		40.77		MODRES	CL		59.17	27M0F8W			P	
IRQ	IRQ25600	11.00	32	43.60	32.80	1.88	0.96	143.00	R13TSS		41.88		MODRES	CR		58.38	27M0F8W			P	
KAZ	KAZ06600	44.00	32	64.72	46.40	4.31	1.70	172.22	R13TSS		35.79		MODRES	CL		58.89	27M0F8W			P	7
LSO	LSO30500	5.00	32	27.80	-29.80	0.66	0.60	36.00	R13TSS		48.47		MODRES	CR		59.27	27M0F8W			P	
MTN	MTN28800	-37.00	32	-7.80	23.40	1.63	1.10	141.00	R13TSS		41.91		MODRES	CR		58.11	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
MWI	MWI30800	-1.00	32	34.10	-13.00	1.54	0.60	87.00	R13TSS		44.79		MODRES	CL		59.39	27M0F8W			P	
NGR	NGR11500	-25.00	32	8.30	16.80	2.54	2.08	44.00	R13TSS		37.22		MODRES	CL		59.62	27M0F8W			P	
NOR	BIFROS22	-0.80	32	17.00	61.50					NO9	32.00	6.00	MODRES	CR		54.50	27M0FXF	BIFROST-2		A	
NOR	NOR12102	5.00	32	17.00	61.50	2.00	1.00	10.00	R13TSS		41.44		R13RES	CL		66.94	27M0F8W			PE	
OMA	OMA12300	17.00	32	55.60	21.00	1.88	1.02	100.00	R13TSS		41.62		MODRES	CL		58.42	27M0F8W			P	
RUS	RSTRSA12	36.00	32	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	32	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	32	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	32	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	32	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	32	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	32	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	32	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-5	42	P	
SDN	SDN23200	-7.00	32	30.40	19.00	2.44	1.52	176.00	R13TSS		38.75		MODRES	CR		58.35	27M0F8W			P	
AFS	AFS02100	5.00	33	24.50	-28.00	3.13	1.68	27.00	R13TSS		37.24		MODRES	CL		59.24	27M0F8W			P	
BEL	BEL01800	-19.00	33	4.60	50.60	0.82	0.60	167.00	R13TSS		47.53		MODRES	CR		58.93	27M0F8W			P	
BFA	BFA10700	-30.00	33	-1.50	12.20	1.45	1.14	29.00	R13TSS		42.26		MODRES	CR		59.06	27M0F8W			P	
CYP	CYP08600	5.00	33	33.30	35.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.68	27M0F8W			P	
D	D2-21600	-1.00	33	12.60	52.10	0.83	0.63	172.00	R13TSS		47.26		MODRES	CL		59.36	27M0F8W			P	
DJI	DJI09900	23.00	33	42.50	11.60	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.68	27M0F8W			P	
F /EUT	E2WA7DA1	29.00	33	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	33	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	33	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	33	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	33	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	33	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	33	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
ISL	ISL04900	-33.50	33	-19.00	64.90	1.00	0.60	177.00	R13TSS		46.67		MODRES	CL		60.97	27M0F8W			P	5, 6
ISR	ISR11000	-13.00	33	34.90	31.40	0.94	0.60	117.00	R13TSS		46.93		MODRES	CL		58.93	27M0F8W			P	
KEN	KEN24900	11.00	33	37.90	1.10	2.29	1.56	94.00	R13TSS		38.92		MODRES	CR		58.92	27M0F8W			P	
LVA	LVA06100	23.00	33	24.53	56.20	0.83	0.60	0.05	R13TSS		47.50		MODRES	CL		58.90	27M0F8W			P	5
MCO	MCO11600	-37.00	33	7.40	43.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.58	27M0F8W			P	
MNG	MNG24800	74.00	33	102.20	46.60	3.60	1.13	169.00	R13TSS		38.35		MODRES	CR		59.15	27M0F8W			P	
MRC	MRC20900	-25.00	33	-9.00	29.20	2.72	1.47	43.00	R13TSS		38.43		MODRES	CL		58.43	27M0F8W			P	
NMB	NMB02500	-19.00	33	17.50	-21.60	2.66	1.90	48.00	R13TSS		37.41		MODRES	CL		59.81	27M0F8W			P	
POR	AZR13400	-30.00	33	-23.40	36.10	2.56	0.70	158.00	R13TSS		41.91		MODRES	CL		58.21	27M0F8W		21	P	5
POR	POR13300	-30.00	33	-8.00	39.60	0.92	0.60	112.00	R13TSS		47.03		MODRES	CL		58.63	27M0F8W		21	P	5
RUS	RSTRSA11	36.00	33	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	33	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0F8W	RST-2	39	P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
RUS	RSTRSA31	86.00	33	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	33	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	33	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	33	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	33	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	33	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-5	42	P	
SEN	SEN22200	-37.00	33	-14.40	13.80	1.46	1.04	139.00	R13TSS		42.63		MODRES	CL		58.83	27M0F8W			P	
UAE	UAE27400	17.00	33	53.60	24.20	0.98	0.80	162.00	R13TSS		45.50		MODRES	CR		58.30	27M0F8W			P	
ALB	ALB29600	-7.00	34	19.80	41.30	0.68	0.60	146.00	R13TSS		48.34		MODRES	CL		58.94	27M0F8W			P	
BDI	BDI27000	11.00	34	29.90	-3.10	0.71	0.60	80.00	R13TSS		48.15		MODRES	CL		58.45	27M0F8W			P	
COG	COG23500	-13.00	34	14.60	-0.70	2.02	1.18	59.00	R13TSS		40.67		MODRES	CL		58.87	27M0F8W			P	
CTI	CTI23700	-30.00	34	-5.60	7.50	1.60	1.22	108.00	R13TSS		41.54		MODRES	CL		58.94	27M0F8W			P	
ETH	ETH09200	23.00	34	39.55	8.58	2.48	1.92	128.32	R13TSS		37.67		MODRES	CL		58.87	27M0F8W			P	
F	REU09700	29.00	34	55.60	-19.20	1.56	0.78	96.00	R13TSS		43.59		MODRES	CR		59.09	27M0F8W		5	P	
F	REU09701	29.00	34	55.60	-19.20	1.56	0.78	96.00	R13TSS		43.59		MODRES	CR		59.09	27M0F8W		5	P	
F /EUT	E2WA7DA2	29.00	34	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	34	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	34	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	34	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	34	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	34	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	34	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
G	G UKDBS	-33.50	34	-3.50	53.80	1.84	0.72	142.00	R13TSS		43.20		MODRES	CR		60.10	27M0F8W	UKDBS-3		A	5, 6
GEO	GEO06400	23.00	34	43.35	42.27	1.11	0.60	161.21	R13TSS		46.23		MODRES	CR		58.93	27M0F8W			P	5, 7
HNG	HNG10600	-1.00	34	19.50	47.20	0.92	0.60	176.00	R13TSS		47.03		MODRES	CR		59.13	27M0F8W			P	
KGZ	KGZ07000	44.00	34	73.88	41.32	1.34	0.64	3.53	R13TSS		45.12		MODRES	CL		58.92	27M0F8W			P	5, 7
KWT	KWT11300	17.00	34	47.60	29.20	0.68	0.60	145.00	R13TSS		48.34		MODRES	CL		58.24	27M0F8W			P	
MTN	MTN22300	-37.00	34	-12.20	18.50	2.62	1.87	150.00	R13TSS		37.55		MODRES	CR		58.05	27M0F8W			P	
NIG	NIG11900	-19.00	34	7.80	9.40	2.16	2.02	45.00	R13TSS		38.05		MODRES	CR		59.15	27M0F8W			P	
RUS	RSTRSA12	36.00	34	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	34	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	34	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	34	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	34	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	34	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	34	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	34	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-5	42	P	
S	S 13800	5.00	34	16.20	61.00	1.04	0.98	14.00	R13TSS		44.36		MODRES	CL		62.36	27M0F8W		27	P	
SDN	SDN23100	-7.00	34	28.90	12.70	2.26	1.96	159.00	R13TSS		37.98		MODRES	CR		58.58	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
SUI	SUI14000	-19.00	34	8.20	46.60	0.98	0.70	171.00	R13TSS		46.08		MODRES	CL		59.28	27M0F8W			P	
SYR	SYR22900	11.00	34	38.30	34.90	1.04	0.90	7.00	R13TSS		44.73		MODRES	CR		58.43	27M0F8W			P	
TUN	TUN15000	-25.00	34	9.50	33.50	1.88	0.72	135.00	R13TSS		43.13		MODRES	CR		59.03	27M0F8W			P	
ZWE	ZWE13500	-1.00	34	29.60	-18.80	1.46	1.36	37.00	R13TSS		41.47		MODRES	CL		59.27	27M0F8W			P	
AGL	AGL29500	-13.00	35	16.50	-12.00	3.09	2.26	84.00	R13TSS		36.01		MODRES	CR		59.31	27M0F8W			P	
BHR	BHR25500	17.00	35	50.50	26.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		55.98	27M0F8W			P	
CVA	CVA08300	-37.00	35	12.40	41.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		60.28	27M0F8W			P	
CZE	CZE14400	17.00	35	15.50	49.79	0.92	0.60	174.55	R13TSS		47.02		MODRES	CL		58.92	27M0F8W			P	5
DNK	DNK09100	5.00	35	-19.50	61.00	2.20	0.80	4.00	R13TSS		41.99		MODRES	CR		61.29	27M0F8W			P	2
E	CNR13000	-30.00	35	-15.70	28.40	1.54	0.60	5.00	R13TSS		44.79		MODRES	CL		57.99	27M0F8W		17	P	
E	E 12900	-30.00	35	-3.10	39.90	2.10	1.14	154.00	R13TSS		40.66		MODRES	CL		59.06	27M0F8W		17	P	
E	HISPASA4	-30.00	35	-4.00	39.00					COP	39.80	5.50	R13RES	CL		57.60	27M0F8W	HISPASAT-1	17	AE	
E	HISPASA6	-30.00	35	-4.00	39.00					COP	39.80	5.50	R13RES	CL		57.60	27M0F8W	HISPASAT-1	17	AE	
ERI	ERI09200	23.00	35	39.41	14.98	1.67	0.95	145.48	R13TSS		42.44		MODRES	CR		58.94	27M0F8W			P	5
F /EUT	E2WA7DA1	29.00	35	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	35	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	35	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	35	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	35	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	35	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	35	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
GHA	GHA10800	-25.00	35	-1.20	7.90	1.48	1.06	102.00	R13TSS		42.49		MODRES	CR		58.79	27M0F8W			P	
GNE	GNE30300	-19.00	35	10.30	1.50	0.68	0.60	10.00	R13TSS		48.34		MODRES	CL		58.94	27M0F8W			P	
HOL	HOL21300	-19.00	35	5.40	52.00	0.76	0.60	171.00	R13TSS		47.86		MODRES	CR		59.56	27M0F8W			P	
JOR	JOR22400	11.00	35	35.80	31.40	0.84	0.78	114.00	R13TSS		46.28		MODRES	CL		58.18	27M0F8W			P	
NOR	BIFROS21	-0.80	35	17.00	61.50					NO9	32.00	6.00	MODRES	CL		54.50	27M0FXF	BIFROST-2		A	
RUS	RSTRSA11	36.00	35	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	35	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	35	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	35	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	35	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	35	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	35	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	35	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-5	42	P	
RUS	RUS00400	110.00	35	127.76	57.81	3.59	1.65	165.75	R13TSS		36.73		MODRES	CL		58.93	27M0F8W			P	5, 7
SDN	SDN23000	-7.00	35	29.20	7.50	2.34	1.12	148.00	R13TSS		40.26		MODRES	CL		59.56	27M0F8W			P	
SRL	SRL25900	-33.50	35	-11.80	8.60	0.78	0.68	114.00	R13TSS		47.20		MODRES	CR		58.60	27M0F8W			P	6
TKM	TKM06800	44.00	35	59.18	38.84	2.25	0.99	164.51	R13TSS		40.94		MODRES	CR		58.94	27M0F8W			P	5
TZA	TZA22500	11.00	35	34.60	-6.20	2.41	1.72	129.00	R13TSS		38.27		MODRES	CR		58.87	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
YUG	YUG14800	-7.00	35	20.50	43.98	0.91	0.60	145.16	R13TSS		47.07		MODRES	CR		58.87	27M0F8W			P	
ARM	ARM06400	23.00	36	44.99	39.95	0.73	0.60	148.17	R13TSS		48.02		MODRES	CR		58.92	27M0F8W			P	5, 7
CAF	CAF25800	-13.00	36	21.00	6.30	2.25	1.68	31.00	R13TSS		38.67		MODRES	CL		59.37	27M0F8W			P	
CPV	CPV30100	-30.00	36	-24.00	16.00	0.86	0.70	144.00	R13TSS		46.65		MODRES	CL		57.35	27M0F8W			P	
DNK	DNK09000	5.00	36	17.00	61.50	2.00	1.00	10.00	R13TSS		41.44		MODRES	CL		63.24	27M0F8W			P	
F	F2_A2788	-7.00	36	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2728	-7.00	36	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2788	-7.00	36	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2728	-7.00	36	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A2788	-7.00	36	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A3328	-7.00	36	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_A3388	-7.00	36	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2728	-7.00	36	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	55.40	27M0G9W	RADIOSAT-3	19	A	
F	F3_D2788	-7.00	36	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	55.40	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3328	-7.00	36	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	54.90	33M0G9W	RADIOSAT-3	19	A	
F	F3_D3388	-7.00	36	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	54.90	33M0G9W	RADIOSAT-3	19	A	
F	MYT09800	29.00	36	45.10	-12.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.58	27M0F8W		7	P	
F	MYT09801	29.00	36	45.10	-12.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.58	27M0F8W		7	P	
F /EUT	E2WA7DA2	29.00	36	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	36	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	36	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	36	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	36	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	36	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	36	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
I	I 08200	-19.00	36	12.30	41.30	2.38	0.98	137.00	R13TSS		40.77		MODRES	CL		59.27	27M0F8W			P	
IRQ	IRQ25600	11.00	36	43.60	32.80	1.88	0.96	143.00	R13TSS		41.88		MODRES	CR		58.48	27M0F8W			P	
KAZ	KAZ06600	44.00	36	64.72	46.40	4.31	1.70	172.22	R13TSS		35.79		MODRES	CL		58.89	27M0F8W			P	7
LSO	LSO30500	5.00	36	27.80	-29.80	0.66	0.60	36.00	R13TSS		48.47		MODRES	CR		59.27	27M0F8W			P	
MTN	MTN28800	-37.00	36	-7.80	23.40	1.63	1.10	141.00	R13TSS		41.91		MODRES	CR		58.11	27M0F8W			P	
MWI	MWI30800	-1.00	36	34.10	-13.00	1.54	0.60	87.00	R13TSS		44.79		MODRES	CL		59.39	27M0F8W			P	
NGR	NGR11500	-25.00	36	8.30	16.80	2.54	2.08	44.00	R13TSS		37.22		MODRES	CL		59.72	27M0F8W			P	
NOR	BIFROS22	-0.80	36	17.00	61.50					NO9	32.00	6.00	MODRES	CR		54.50	27M0FXF	BIFROST-2		A	
OMA	OMA12300	17.00	36	55.60	21.00	1.88	1.02	100.00	R13TSS		41.62		MODRES	CL		58.42	27M0F8W			P	
RUS	RSTRSA12	36.00	36	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	36	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	36	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	36	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	36	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0G7W	RST-1	38	P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
RUS	RSTRSD22	56.00	36	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	36	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	36	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-5	42	P	
SDN	SDN23200	-7.00	36	30.40	19.00	2.44	1.52	176.00	R13TSS		38.75		MODRES	CR		58.35	27M0F8W			P	
AFS	AFS02100	5.00	37	24.50	-28.00	3.13	1.68	27.00	R13TSS		37.24		MODRES	CL		59.34	27M0F8W			P	
BEL	BEL01800	-19.00	37	4.60	50.60	0.82	0.60	167.00	R13TSS		47.53		MODRES	CR		59.43	27M0F8W			P	
BFA	BFA10700	-30.00	37	-1.50	12.20	1.45	1.14	29.00	R13TSS		42.26		MODRES	CR		59.16	27M0F8W			P	
CYP	CYP08600	5.00	37	33.30	35.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.78	27M0F8W			P	
D	D2-21600	-1.00	37	12.60	52.10	0.83	0.63	172.00	R13TSS		47.26		MODRES	CL		59.36	27M0F8W			P	
DJI	DJI09900	23.00	37	42.50	11.60	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.68	27M0F8W			P	
F /EUT	E2WA7DA1	29.00	37	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	37	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	37	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	37	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	37	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	37	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	37	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
ISL	ISL04900	-33.50	37	-19.00	64.90	1.00	0.60	177.00	R13TSS		46.67		MODRES	CL		60.97	27M0F8W			P	5, 6
ISR	ISR11000	-13.00	37	34.90	31.40	0.94	0.60	117.00	R13TSS		46.93		MODRES	CL		59.03	27M0F8W			P	
KEN	KEN24900	11.00	37	37.90	1.10	2.29	1.56	94.00	R13TSS		38.92		MODRES	CR		58.92	27M0F8W			P	
LVA	LVA06100	23.00	37	24.53	56.20	0.83	0.60	0.05	R13TSS		47.50		MODRES	CL		58.90	27M0F8W			P	5
MCO	MCO11600	-37.00	37	7.40	43.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		57.58	27M0F8W			P	
MNG	MNG24800	74.00	37	102.20	46.60	3.60	1.13	169.00	R13TSS		38.35		MODRES	CR		59.25	27M0F8W			P	
MRC	MRC20900	-25.00	37	-9.00	29.20	2.72	1.47	43.00	R13TSS		38.43		MODRES	CL		58.53	27M0F8W			P	
NMB	NMB02500	-19.00	37	17.50	-21.60	2.66	1.90	48.00	R13TSS		37.41		MODRES	CL		59.91	27M0F8W			P	
POR	AZR13400	-30.00	37	-23.40	36.10	2.56	0.70	158.00	R13TSS		41.91		MODRES	CL		58.21	27M0F8W		21	P	5
POR	POR13300	-30.00	37	-8.00	39.60	0.92	0.60	112.00	R13TSS		47.03		MODRES	CL		58.63	27M0F8W		21	P	5
RUS	RSTRSA11	36.00	37	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	37	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	37	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	37	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	37	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	37	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	37	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	37	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-5	42	P	
SEN	SEN22200	-37.00	37	-14.40	13.80	1.46	1.04	139.00	R13TSS		42.63		MODRES	CL		58.93	27M0F8W			P	
UAE	UAE27400	17.00	37	53.60	24.20	0.98	0.80	162.00	R13TSS		45.50		MODRES	CR		58.40	27M0F8W			P	
ALB	ALB29600	-7.00	38	19.80	41.30	0.68	0.60	146.00	R13TSS		48.34		MODRES	CL		59.04	27M0F8W			P	
BDI	BDI27000	11.00	38	29.90	-3.10	0.71	0.60	80.00	R13TSS		48.15		MODRES	CL		58.55	27M0F8W			P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
COG	COG23500	-13.00	38	14.60	-0.70	2.02	1.18	59.00	R13TSS		40.67		MODRES	CL		58.97	27M0F8W			P	
CTI	CTI23700	-30.00	38	-5.60	7.50	1.60	1.22	108.00	R13TSS		41.54		MODRES	CL		58.94	27M0F8W			P	
ETH	ETH09200	23.00	38	39.55	8.58	2.48	1.92	128.32	R13TSS		37.67		MODRES	CL		58.87	27M0F8W			P	
F	REU09700	29.00	38	55.60	-19.20	1.56	0.78	96.00	R13TSS		43.59		MODRES	CR		59.19	27M0F8W		5	P	
F	REU09701	29.00	38	55.60	-19.20	1.56	0.78	96.00	R13TSS		43.59		MODRES	CR		59.19	27M0F8W		5	P	
F /EUT	E2WA7DA2	29.00	38	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	38	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	38	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	38	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	38	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	38	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	38	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
G	G UKDBS	-33.50	38	-3.50	53.80	1.84	0.72	142.00	R13TSS		43.20		MODRES	CR		60.10	27M0F8W	UKDBS-3		A	5, 6
GEO	GEO06400	23.00	38	43.35	42.27	1.11	0.60	161.21	R13TSS		46.23		MODRES	CR		58.93	27M0F8W			P	5, 7
HNG	HNG10600	-1.00	38	19.50	47.20	0.92	0.60	176.00	R13TSS		47.03		MODRES	CR		59.23	27M0F8W			P	
KGZ	KGZ07000	44.00	38	73.88	41.32	1.34	0.64	3.53	R13TSS		45.12		MODRES	CL		58.92	27M0F8W			P	5, 7
KWT	KWT11300	17.00	38	47.60	29.20	0.68	0.60	145.00	R13TSS		48.34		MODRES	CL		58.34	27M0F8W			P	
MTN	MTN22300	-37.00	38	-12.20	18.50	2.62	1.87	150.00	R13TSS		37.55		MODRES	CR		58.05	27M0F8W			P	
NIG	NIG11900	-19.00	38	7.80	9.40	2.16	2.02	45.00	R13TSS		38.05		MODRES	CR		59.15	27M0F8W			P	
NOR	NOR12000	5.00	38	13.10	64.10	1.84	0.88	10.00	R13TSS		42.35		MODRES	CL		61.95	27M0F8W			P	
RUS	RSTRSA12	36.00	38	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	38	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	38	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	38	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	38	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	38	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	38	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	38	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-5	42	P	
SDN	SDN23100	-7.00	38	28.90	12.70	2.26	1.96	159.00	R13TSS		37.98		MODRES	CR		58.68	27M0F8W			P	
SUI	SUI14000	-19.00	38	8.20	46.60	0.98	0.70	171.00	R13TSS		46.08		MODRES	CL		59.28	27M0F8W			P	
SYR	SYR33900	11.00	38	37.60	34.20	1.32	0.88	74.00	R13TSS		43.80		MODRES	CR		58.40	27M0F8W			P	1
TUN	TUN27200	-25.00	38	2.50	32.00	3.59	1.75	175.00	R13TSS		36.47		MODRES	CR		56.87	27M0F8W			P	4
ZWE	ZWE13500	-1.00	38	29.60	-18.80	1.46	1.36	37.00	R13TSS		41.47		MODRES	CL		59.37	27M0F8W			P	
AGL	AGL29500	-13.00	39	16.50	-12.00	3.09	2.26	84.00	R13TSS		36.01		MODRES	CR		59.41	27M0F8W			P	
BHR	BHR25500	17.00	39	50.50	26.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		55.98	27M0F8W			P	
CVA	CVA08300	-37.00	39	12.40	41.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		60.38	27M0F8W			P	
CZE	CZE14400	17.00	39	15.50	49.79	0.92	0.60	174.55	R13TSS		47.02		MODRES	CL		58.92	27M0F8W			P	5
E	CNR13000	-30.00	39	-15.70	28.40	1.54	0.60	5.00	R13TSS		44.79		MODRES	CL		57.99	27M0F8W		17	P	
E	E 12900	-30.00	39	-3.10	39.90	2.10	1.14	154.00	R13TSS		40.66		MODRES	CL		59.16	27M0F8W		17	P	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
E	HISPASA4	-30.00	39	-4.00	39.00					COP	39.80	5.50	R13RES	CL		57.60	27M0F8W	HISPASAT-1	17	AE	
E	HISPASA6	-30.00	39	-4.00	39.00					COP	39.80	5.50	R13RES	CL		57.60	27M0F8W	HISPASAT-1	17	AE	
ERI	ERI09200	23.00	39	39.41	14.98	1.67	0.95	145.48	R13TSS		42.44		MODRES	CR		58.94	27M0F8W			P	5
F /EUT	E2WA7DA1	29.00	39	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB1	29.00	39	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CR		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC1	29.00	39	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CR		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD1	29.00	39	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CR		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE1	29.00	39	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CR		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF1	29.00	39	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CR		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG1	29.00	39	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CR		51.30	27M0F9W	EUROPESAT-1	16	AE	8
GHA	GHA10800	-25.00	39	-1.20	7.90	1.48	1.06	102.00	R13TSS		42.49		MODRES	CR		58.79	27M0F8W			P	
GNE	GNE30300	-19.00	39	10.30	1.50	0.68	0.60	10.00	R13TSS		48.34		MODRES	CL		59.04	27M0F8W			P	
HOL	HOL21300	-19.00	39	5.40	52.00	0.76	0.60	171.00	R13TSS		47.86		MODRES	CR		59.66	27M0F8W			P	
ISL	ISL05000	5.00	39	-19.50	61.00	2.20	0.80	4.00	R13TSS		41.99		MODRES	CR		61.49	27M0F8W			P	2
JOR	JOR22400	11.00	39	35.80	31.40	0.84	0.78	114.00	R13TSS		46.28		MODRES	CL		58.28	27M0F8W			P	
MNG	MNG24800	74.00	39	102.20	46.60	3.60	1.13	169.00	R13TSS		38.35		MODRES	CR		59.25	27M0F8W			P	
NOR	BIFROS21	-0.80	39	17.00	61.50					NO9	32.00	6.00	MODRES	CL		54.50	27M0FXF	BIFROST-2		A	
RUS	RSTRSA11	36.00	39	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	39	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	39	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	39	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	39	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	39	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CL		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	39	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	39	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CL		55.00	27M0G7W	RST-5	42	P	
RUS	RUS00400	110.00	39	127.76	57.81	3.59	1.65	165.75	R13TSS		36.73		MODRES	CL		58.93	27M0F8W			P	5, 7
SDN	SDN23000	-7.00	39	29.20	7.50	2.34	1.12	148.00	R13TSS		40.26		MODRES	CL		59.56	27M0F8W			P	
SRL	SRL25900	-33.50	39	-11.80	8.60	0.78	0.68	114.00	R13TSS		47.20		MODRES	CR		58.70	27M0F8W			P	6
TKM	TKM06800	44.00	39	59.18	38.84	2.25	0.99	164.51	R13TSS		40.94		MODRES	CR		58.94	27M0F8W			P	5
TZA	TZA22500	11.00	39	34.60	-6.20	2.41	1.72	129.00	R13TSS		38.27		MODRES	CR		58.87	27M0F8W			P	
YUG	YUG14800	-7.00	39	20.50	43.98	0.91	0.60	145.16	R13TSS		47.07		MODRES	CR		58.87	27M0F8W			P	
ARM	ARM06400	23.00	40	44.99	39.95	0.73	0.60	148.17	R13TSS		48.02		MODRES	CR		58.92	27M0F8W			P	5, 7
CAF	CAF25800	-13.00	40	21.00	6.30	2.25	1.68	31.00	R13TSS		38.67		MODRES	CL		59.47	27M0F8W			P	
CPV	CPV30100	-30.00	40	-24.00	16.00	0.86	0.70	144.00	R13TSS		46.65		MODRES	CL		57.35	27M0F8W			P	
F	F2_A2788	-7.00	40	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2728	-7.00	40	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F2aA2788	-7.00	40	2.60	45.90	2.50	0.98	160.00	R13TSS		41.60		MODRES	CL		58.00	27M0F9W	RADIOSAT-2	19	A	
F	F3_A2728	-7.00	40	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	
F	F3_A2788	-7.00	40	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	27M0F9W	RADIOSAT-3	19	A	

1	2	3	4	5		6			7	8	9		10	11		12	13	14	15	16	17
Admin. Symbol	Beam Identification	Orbital Position	Chan-nel	Boresight		Space Antenna Characteristic			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
				Long.°	Lat.°	Major°	Minor°	Orient.°			Co-polar.	X-polar.		Typ.	Angle°						
F	F3_A3328	-7.00	40	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_A3388	-7.00	40	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	33M0F9W	RADIOSAT-3	19	A	
F	F3_D2728	-7.00	40	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D2788	-7.00	40	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	27M0G9W	RADIOSAT-3	19	A	
F	F3_D3328	-7.00	40	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	F3_D3388	-7.00	40	2.60	45.90	2.50	0.98	160.00	RAD_TSS		41.60		MODRES	LE	158.00	56.00	33M0G9W	RADIOSAT-3	19	A	
F	MYT09800	29.00	40	45.10	-12.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.58	27M0F8W		7	P	
F	MYT09801	29.00	40	45.10	-12.80	0.60	0.60	0.00	R13TSS		48.88		MODRES	CR		58.58	27M0F8W		7	P	
F /EUT	E2WA7DA2	29.00	40	1.90	49.00	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		51.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DB2	29.00	40	12.70	44.50	1.82	1.82	0.00	R13TSS		40.40		R13RES	CL		52.00	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DC2	29.00	40	8.90	61.30	3.06	0.71	9.00	R13TSS		41.50		R13RES	CL		60.50	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DD2	29.00	40	17.50	40.40	2.54	1.07	168.00	R13TSS		40.70		R13RES	CL		53.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DE2	29.00	40	-12.50	35.50	3.75	1.27	25.00	R13TSS		38.30		R13RES	CL		57.30	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DF2	29.00	40	35.40	38.70	2.25	0.93	174.00	R13TSS		41.70		R13RES	CL		54.70	27M0F9W	EUROPESAT-1	16	AE	8
F /EUT	E2WA7DG2	29.00	40	8.00	49.70	2.84	1.45	26.00	R13TSS		39.30		R13RES	CL		51.30	27M0F9W	EUROPESAT-1	16	AE	8
I	I 08200	-19.00	40	12.30	41.30	2.38	0.98	137.00	R13TSS		40.77		MODRES	CL		59.27	27M0F8W			P	
IRQ	IRQ25600	11.00	40	43.60	32.80	1.88	0.96	143.00	R13TSS		41.88		MODRES	CR		58.48	27M0F8W			P	
KAZ	KAZ06600	44.00	40	64.72	46.40	4.31	1.70	172.22	R13TSS		35.79		MODRES	CL		58.89	27M0F8W			P	7
LSO	LSO30500	5.00	40	27.80	-29.80	0.66	0.60	36.00	R13TSS		48.47		MODRES	CR		59.37	27M0F8W			P	
MTN	MTN28800	-37.00	40	-7.80	23.40	1.63	1.10	141.00	R13TSS		41.91		MODRES	CR		58.21	27M0F8W			P	
MWI	MWI30800	-1.00	40	34.10	-13.00	1.54	0.60	87.00	R13TSS		44.79		MODRES	CL		59.49	27M0F8W			P	
NGR	NGR11500	-25.00	40	8.30	16.80	2.54	2.08	44.00	R13TSS		37.22		MODRES	CL		59.72	27M0F8W			P	
NOR	BIFROS22	-0.80	40	17.00	61.50					NO9	32.00	6.00	MODRES	CR		54.50	27M0FXF	BIFROST-2		A	
OMA	OMA12300	17.00	40	55.60	21.00	1.88	1.02	100.00	R13TSS		41.62		MODRES	CL		58.52	27M0F8W			P	
RUS	RSTRSA12	36.00	40	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	40	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	40	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	40	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	40	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		53.00	27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	40	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	CR		55.00	27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	40	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	40	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	CR		55.00	27M0G7W	RST-5	42	P	
S	S 13902	5.00	40	17.00	61.50	2.00	1.00	10.00	R13TSS		41.44		R13RES	CL		68.24	27M0F8W			PE	
SDN	SDN23200	-7.00	40	30.40	19.00	2.44	1.52	176.00	R13TSS		38.75		MODRES	CR		58.45	27M0F8W			P	

NOC ARTICLE 12

ARTICLE 13

Interference

(MOD) 13.1 The Member States of the Union shall endeavour to agree on the action required to reduce harmful interference which might be caused by the application of these provisions and the associated Plans.

ARTICLE 14

Period of Validity of the Provisions and Associated Plans

NOC 14.1 and 14.2

MOD 14.3 In any event, the provisions and associated Plans shall remain in force until their revision by a competent radiocommunication conference convened in accordance with the relevant provisions of the Constitution and Convention in force.

NOC ANNEX 1

ANNEX 2

Basic Characteristics to Be Furnished in Notices[1] Relating to Space Stations in the Broadcasting-Satellite Service[2]

MOD 1. Country and beam identification.

NOC 2.

MOD 3. Assigned frequency.

ADD 4. Assigned frequency band.

NOC 5. and 6.

MOD 7. Service area identified by:

MOD *a)* a set of a maximum of twenty test points, and

ADD *b)* a service-area contour on the surface of the Earth or a service area defined by a minimum elevation angle in degrees, and

ADD *c)* the name of other administration(s) (country/territory symbols) included in the service area.

NOC 8. to 10.

MOD 11. Power supplied to the antenna (dBW) and maximum power density per Hz supplied to the antenna (dB(W/Hz)), averaged over the worst 5 MHz, 4 kHz and 27 MHz, as well as averaged over the worst 40 kHz in the case of Region 2.

NOC 12.

(MOD) [2] In Region 2, only those notices relating to frequency assignments for space stations used for telemetry and tracking purposes associated with the Region 2 Plan shall be furnished in accordance with Appendix **S4** Annexes 2A and 2B to the Radio Regulations.

MOD 12. *a)* co-polar gain of the antenna in the direction of maximum radiation referred to an isotropic antenna (dBi), as well as the cross-polar gain of the antenna in the case of a beam of other than elliptical shape;

NOC 12. *b)* and *c)*

MOD 12. *d)* sense of polarization, and, in the case of a linear polarization, the angle (in degrees) measured counter-clockwise in a plane normal to the beam axis from the equatorial plane to the electric vector of the wave as seen from the satellite in the direction of the nominal boresight or aim point as defined under § 8. above;

MOD 12. *e)* for elliptical beams[1] indicate the following:

– co-polar and cross-polar radiation patterns;

– rotation accuracy;

– orientation;

– major axis (degrees) at the half-power beamwidth;

– minor axis (degrees) at the half-power beamwidth;

MOD 12. *f)* for beams of other than elliptical shape, indicate the following:

NOC 13. to 14. *h)*

ADD 14. *i)* in the case of a digital modulation, the effective and transmitted bit/symbol rates.

NOC 15.

MOD 16. Receiving antenna characteristics of the earth station:

ADD *a)* isotropic gain (dBi) of the antenna in the direction of maximum radiation;

ADD [1] A circular beam is considered as a particular elliptical beam where the major and minor axes are equal and where the major axis orientation and rotational accuracy are equal to 0°.

ADD *b)* beamwidth in degrees between the half-power points (describe in detail if not symmetrical);

ADD *c)* either the measured co-polar and cross-polar radiation patterns of the antenna (taking as a reference the direction of maximum radiation) or the reference co-polar and cross-polar radiation patterns;

ADD *d)* equivalent diameter of the antenna (metres);

(MOD) *e)* type of reception (individual or community) in the case of Regions 1 and 3.

NOC 17. to 20.

MOD 21. Operating administration or agency.

ADD 22. Connection between Earth-to-space and space-to-Earth frequencies in the network in the case of Region 2.

ADD 23. Description of the group(s) required in the case of non-simultaneous emissions.

NOC ANNEX 3

NOC ANNEX 4

ANNEX 5

MOD

Technical Data Used in Establishing the Provisions and Associated Plans and Which Should Be Used for Their Application[1]

1. DEFINITIONS

MOD 1.1 *Downlink service area*

The area on the surface of the Earth in which the administration responsible for the service has the right to demand that the agreed protection conditions be provided.

NOTE – In the definition of service area, it is made clear that within the service area the agreed protection conditions can be demanded. This is the area where there should be at least the wanted power flux-density and protection against interference based on the agreed protection ratio for the agreed percentage of time.

MOD 1.2 *Downlink coverage area*

The area on the surface of the Earth delineated by a contour of a constant given value of power flux-density which would permit the wanted quality of reception in the absence of interference.

NOTE 1 – In accordance with the provisions of No. **S23.13** of the Radio Regulations, the coverage area must be the smallest area which encompasses the service area.

NOTE 2 – The coverage area, which will normally encompass the entire service area, will result from the intersection of the antenna beam (elliptical, circular, or shaped) with the surface of the Earth, and will be defined by a given value of power flux-density. For example, it would be the area delineated by the contour corresponding

---

ADD [1] In revising this Annex at the 1997 World Radiocommunication Conference, no changes have been made to the technical data applicable to the Region 2 Plan. However, for all three Regions, it should be noted that some of the parameters of networks proposed as modifications to the Plans may differ from the technical data presented herein.

to the level specified in § 3.16 of this Annex. There will usually be an area outside the service area but within the coverage area in which the power flux-density will be at least equivalent to the minimum specified value; however, protection against interference will not be provided in this area.

NOTE 3 – If coverage is provided by a steerable beam, the contour delineating the coverage area will depend on the pointing capability of the beam and will not necessarily cover the entire service area.

MOD 1.3 *Downlink beam area*

The area delineated by the intersection of the half-power beam of the satellite transmitting antenna with the surface of the Earth. The downlink beam area concept was generally used for planning purposes in conjunction with elliptical beams.

NOTE – The beam area is simply that area on the Earth's surface corresponding to the –3 dB points on the satellite antenna radiation pattern. In many cases the beam area would almost coincide with the coverage area, the discrepancy being accounted for by the permanent difference in path lengths from the satellite throughout the beam area, and also by the permanent variations, if any, in propagation factors across the area. However, for a service area where the maximum dimension as seen from the satellite position is less than 0.6° in Regions 1 and 3, and less than 0.8° in Region 2 (the agreed minimum practicable satellite antenna half-power beamwidths), there could be a significant difference between the beam area and the coverage area.

NOC 1.4 *Nominal orbital position*

(MOD) 1.5 *Adjacent channel*

The RF channel in the broadcasting-satellite service frequency Plan, or in the associated feeder-link frequency Plan, which is situated immediately higher or lower in frequency with respect to the reference channel.

(MOD) 1.6 *Second adjacent channel*

The RF channel in the broadcasting-satellite service frequency Plan, or in the associated feeder-link frequency Plan, which is situated immediately beyond either of the adjacent channels, with respect to the reference channel.

1.7 *Overall carrier-to-interference ratio*

(MOD) The overall carrier-to-interference ratio is the ratio of the wanted carrier power to the sum of all interfering RF powers in a given channel including both feeder links and downlinks. The overall carrier-to-interference ratio due to interference from the given channel is calculated as the reciprocal of the sum of the reciprocals of the feeder-link carrier-to-interference ratio and the down-link carrier-to-interference ratio referred to the satellite receiver input and earth station receiver input, respectively[1].

(MOD) 1.8 *Overall co-channel protection margin*

The overall co-channel protection margin in a given channel is the difference in decibels between the overall co-channel carrier-to-interference ratio and the co-channel protection ratio.

(MOD) 1.9 *Overall adjacent channel protection margin*

The overall adjacent channel protection margin is the difference in decibels between the overall adjacent channel carrier-to-interference ratio and the adjacent channel protection ratio.

(MOD) 1.10 *Overall second adjacent channel protection margin*

The overall second adjacent channel protection margin is the difference in decibels between the overall second adjacent channel carrier-to-interference ratio and the second adjacent channel protection ratio.

(MOD) [1] There are a total of five overall carrier-to-interference ratios used in the analysis of the Plan for the broadcasting-satellite service in Region 2, namely, co-channel, upper and lower adjacent channels, and upper and lower second adjacent channels. In Regions 1 and 3, three ratios are normally used, namely, co-channel and upper and lower adjacent channels. However, see the footnote to the definition of M_4 and M_5 in § 1.11 of this Annex.

(MOD) 1.11 *Overall equivalent protection margin*[1]

The overall equivalent protection margin M is given in decibels by the expression:

$$M = -10 \log \left(\sum_{i=1}^{5} 10^{(-M_i/10)} \right)$$

where:

M_1 = overall co-channel protection margin, in dB (as defined in § 1.8 of this Annex);

M_2, M_3 = overall adjacent channel protection margins for the upper and lower adjacent channels, respectively, in dB (as defined in § 1.9 of this Annex);

M_4, M_5 = overall second adjacent channel protection margins for the upper and lower second adjacent channels, respectively, in dB (as defined in § 1.10 of this Annex)[2] .

MOD [1] For calculation of overall equivalent protection margin for Regions 1 and 3, as defined at WARC Orb-88, see alternative formula in § 1.12 to Annex 3 of Appendix 30A (S30A).

MOD [2] M_4 and M_5 are normally applicable only for Region 2. However, in certain cases (e.g. when the channel spacing and/or bandwidth of an assignment are different from the values given in § 3.5 and 3.8 of this Annex), these margins may also be used for Regions 1 and 3, provided that appropriate protection masks are included in ITU-R Recommendations. Until a relevant ITU-R Recommendation is incorporated in this Annex by reference, the Bureau will use the worst-case approach as adopted by the Radio Regulations Board.

The adjective “equivalent” indicates that the protection margins for all interference sources from the adjacent and second adjacent channels as well as co-channel interference sources have been included.

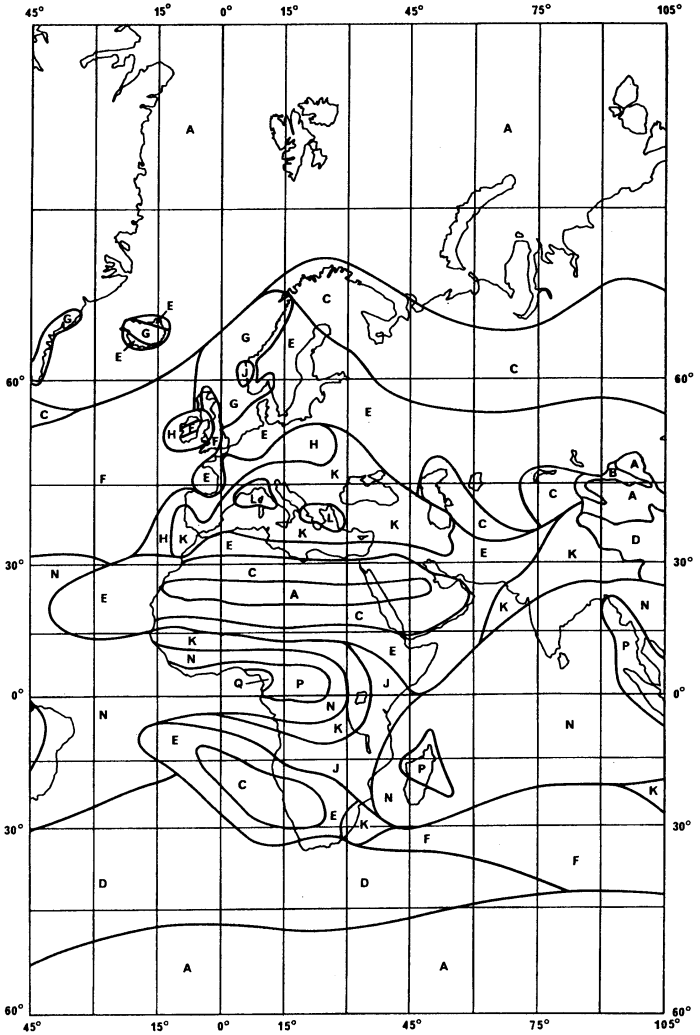
2. RADIO PROPAGATION FACTORS

In Regions 1 and 3:

MOD 2.1 The propagation loss on the space-to-Earth path (used for computing downlink e.i.r.p. and as a guide in choosing orbital locations during the development of the Plan) is equal to the free-space path loss plus the atmospheric absorption and the rain attenuation exceeded for 1% of the worst month. Values of this attenuation can be calculated as a function of angle of elevation for the rain-climatic zones shown in Figures 1 and 2 from Recommendation ITU-R P.837-1 by applying the method described in Recommendation ITU-R P.618-5.

In Region 2:

(MOD) 2.2 The propagation loss on a space-Earth path is equal to the free-space path loss plus the atmospheric absorption loss plus the rain attenuation exceeded for 1% of the worst month.

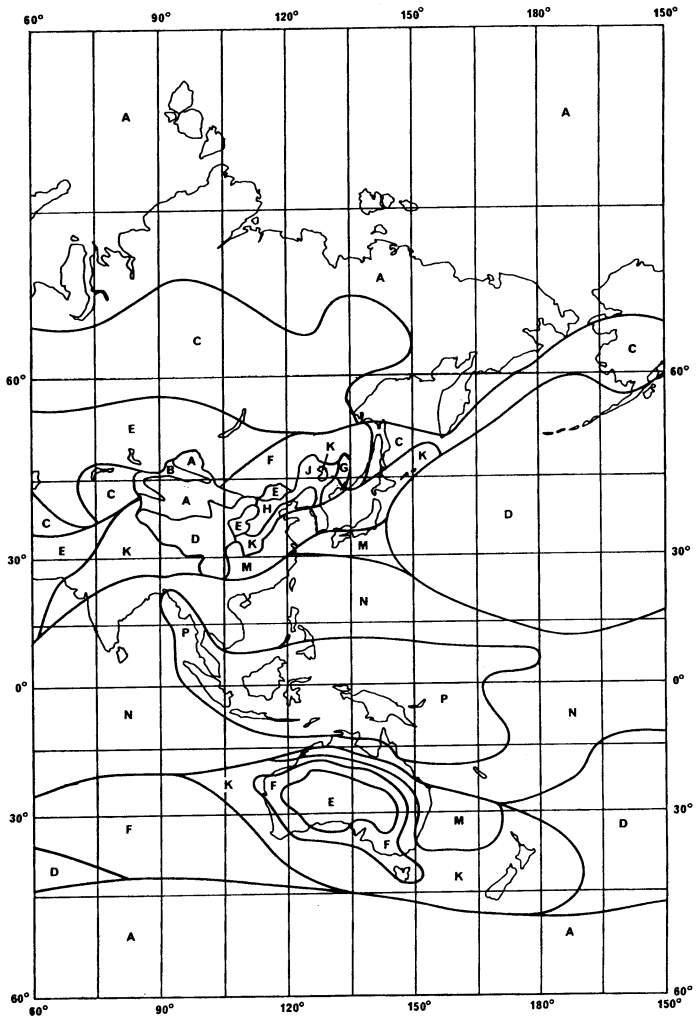


D02-sc

MOD

FIGURE 1

Rain climatic zones for Regions 1 and 3 between longitudes 45° W and 105° E



MOD

FIGURE 2

Rain climatic zones for Regions 1 and 3 between longitudes 60° E and 150° W

(MOD) 2.2.1 *Atmospheric absorption*

The loss due to atmospheric absorption (i.e. clear-sky attenuation) is given by:

$$A_a = \frac{92.20}{\cos\theta}\left[\, 0.017F_o + 0.002\,\rho F_w \,\right] \text{ (dB)} \qquad \text{for } \theta < 5°$$

where:

$$F_o = \left[\, 24.88 \tan\theta + 0.339 \sqrt{1416.77 \tan^2\theta + 5.51} \,\right]^{-1}$$

$$F_w = \left[\, 40.81 \tan\theta + 0.339 \sqrt{3811.66 \tan^2\theta + 5.51} \,\right]^{-1}$$

and:

$$A_a = \frac{0.042 + 0.003\,\rho}{\sin\theta} \text{ (dB)} \qquad \text{for } \theta \geq 5°$$

where:

θ = elevation angle (degrees),

ρ = surface water vapour concentration, g/m^3, being

ρ = 10 g/m^3 for rain climatic zones A to K and

ρ = 20 g/m^3 for rain climatic zones M to P (see Figure 3).

(MOD) 2.2.2 *Rain attenuation*

The rain attenuation A_p of circularly polarized signals exceeded for 1% of the worst month at 12.5 GHz is given by:

$$A_p = 0.21\ \gamma\ L\ r \qquad \text{(dB)} \qquad (1)$$

where:

L: slant path length through rain

$$= \frac{2(h_R - h_0)}{\left\{\sin^2\theta + 2\frac{h_R - h_0}{8500}\right\}^{1/2} + \sin\theta} \quad \text{(km)}$$

r: rain path length reduction factor

$$= \frac{90}{90 + 4L\cos\theta}$$

h_R: rain height (km)

$$= c\left\{5.1 - 2.15\log\left(1 + 10^{(\zeta - 27)/25}\right)\right\} \quad \text{(km)}$$

where:

$c = 0.6$ for $|\zeta| \leq 20°$

$c = 0.6 + 0.02\,(|\zeta| - 20)$ for $20° < |\zeta| \leq 40°$

$c = 1.0$ for $|\zeta| > 40°$

h_0: height (km) above mean sea level of the earth station;

ζ: earth station latitude (degrees);

θ: elevation angle (degrees);

γ: specific rain attenuation = $0.0202\,R^{1.198}$ dB/km;

R: rain intensity (mm/h) obtained from the table below for the rain climatic zones identified in Figure 3.

(NOTE – The method is based on R exceeded for 0.01% of an average year.)

Rainfall intensity (R) for the rain climatic zones (exceeded for 0.01% of an average year) (see Figure 3)

Rain climatic zone	A	B	C	D	E	F	G	K	M	N	P
Rainfall intensity (mm/h)	8	12	15	19	22	28	30	42	63	95	145

Figure 4 presents plots of rain attenuation, as calculated using equation (1), of circularly polarized signals exceeded for 1% of the worst month at 12.5 GHz, as a function of earth station latitude and elevation angle for each of the rain climatic zones shown in Figure 3.

(MOD) 2.2.3 *Rain attenuation limit*

In the analysis of the Plan for the broadcasting-satellite service in Region 2, a maximum downlink attenuation of 9 dB was agreed in order to limit the inhomogeneity of broadcasting-satellite power flux-density and to facilitate sharing during clear-sky conditions.

NOC FIGURE 3

(MOD) 2.2.4 *Procedure for calculating the carrier-to-interference ratio at a test point*

The calculation of the down-link carrier-to-interference ratio (exceeded for 99% of the worst month) used to obtain the overall equivalent protection margin at a test point is the minimum value of the carrier-to-interference ratio obtained assuming:

i) clear-sky conditions (i.e. including atmospheric absorption); *or*

ii) rain-faded conditions corresponding to an attenuation value exceeded for 1% of the worst month.

(MOD) 2.3 *Depolarization*

Rain and ice can cause depolarization of radio frequency signals. The level of the co-polar component relative to the depolarized component is given by the cross-polarization discrimination (XPD) ratio. For circularly polarized emissions, the XPD ratio, in dB, exceeded for 99% of the worst month is obtained from:

$$XPD = 30 \log f - 40 \log (\cos \theta) - 20 \log A_p \quad (2)$$

$$\text{for } 5° \leq \theta \leq 60°$$

where A_p (dB) is the co-polar rain attenuation exceeded for 1% of the worst month (calculated in § 2.2), f is the frequency in GHz and θ is the elevation angle. For angles of θ greater than 60°, use $\theta = 60°$ in equation (2).

NOC FIGURE 4

3. BASIC TECHNICAL CHARACTERISTICS

NOC 3.1

(MOD) 3.1.1 In Regions 1 and 3, planning of the broadcasting-satellite service is normally based on the use of a signal consisting of a video signal with an associated carrier, frequency-modulated by a sound signal, both frequency-modulating a carrier in the 12 GHz band, with a pre-emphasis characteristic in accordance with Figure 5 (from Recommendation ITU-R F.405-1).

NOC FIGURE 5

NOC 3.1.2

(MOD) 3.1.3 Nevertheless, other modulating signals having different characteristics (e.g. modulation with sound channels frequency-multiplexed within the bandwidth of a television channel, digital modulation of sound and television signals, or other pre-emphasis characteristics) are not precluded, provided that

appropriate protection masks and calculation methods[1] are applied or if the use of such characteristics complies with the provisions of § 3.2 of Article 3 of this Appendix.

NOC 3.2 *Polarization*

(MOD) 3.2.1 For the planning of the broadcasting-satellite service, circular polarization is generally used. However, for implementation of assignments in the Plan, linear polarization may also be used, subject to the successful application of the modification procedure of Article 4.

NOC 3.2.2 and 3.2.3

ADD 3.2.4 Linear polarization is defined in Recommendation ITU-R BO.1212. This Recommendation should be used when analysing linearly polarized signals.

NOC 3.3

ADD [1] Protection masks for verifying that this provision is met are not yet fully defined in existing ITU-R Recommendations. Recommendations for interference between analogue and digital signals are still under development. In absence of criteria to evaluate interference, the Bureau will use the worst-case approach as adopted by the Radio Regulations Board.

MOD 3.4 *Protection ratio between television signals*

For developing the original 1977 broadcasting-satellite service Plan for Regions 1 and 3, the following protection ratios were used[1, 2]:

– 31 dB for co-channel signals;

– 15 dB for adjacent channel signals.

For revising this Plan at the 1997 World Radiocommunication Conference, the following aggregate downlink protection ratios were specified in Recommendation ITU-R BO.1297 for the purpose of calculating downlink equivalent protection margins[2]:

– 24 dB for co-channel signals;

– 16 dB for adjacent channel signals;

ADD [1] These protection ratio values may be used for the assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997.

ADD [2] The equivalent protection margin M is given in dB by the formula

$$M = -10 \log (10^{-M_1/10} + 10^{-M_2/10} + 10^{-M_3/10})$$

where M_1 is the value in dB of the protection margin for the same channel. This is defined in the following expression where the powers are evaluated at the receiver input:

$$\frac{\text{wanted power}}{\text{sum of the co-channel interfering powers}} \text{ (dB)} - \text{co-channel protection ratio (dB)}$$

M_2 and M_3 are the values in dB of the upper and lower adjacent-channel protection margins respectively.

The definition of the adjacent-channel protection margin is similar to that for the co-channel case except that the adjacent-channel protection ratio and the sum of the interfering powers due to emissions in the adjacent channel are considered.

In revising the Regions 1 and 3 Plan at the 1997 World Radiocommunication Conference, the following aggregate overall protection ratio values were used (as specified in Recommendation **521 (WRC-95)**) for calculating the overall co-channel and adjacent-channel protection margins as defined in § 1.8 and 1.9 of this Annex:

– 23 dB for co-channel signals;

– 15 dB for adjacent channel signals.

Recommendation **521 (WRC-95)** also specified that for the revision of the Regions 1 and 3 Plan, no overall co-channel single entry *C/I* should be lower than 28 dB.

However, for the assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997, the overall equivalent protection margins were calculated using a co-channel overall protection ratio of 30 dB and lower and upper overall adjacent channel protection ratios of 14 dB[1].

Revision of the Regions 1 and 3 Plan at the 1997 World Radiocommunication Conference was generally based on a set of reference parameters such as the average e.i.r.p., the reference earth station receiving antenna, all test points placed within the –3 dB contour, a bandwidth of 27 MHz and the predetermined value of *C/N*.

Protection masks and associated calculation methods for interference into broadcast satellite systems involving digital emissions are given in Recommendation ITU-R BO.1293.

ADD

[1] The overall protection margin calculation method used is based on the first formula in § 1.12 of Annex 3 to Appendix **30A (S30A)**.

In Region 2, the following protection ratios have been adopted for the purpose of calculating the overall equivalent protection margin[1]:

28 dB for co-channel signals;

13.6 dB for adjacent-channel signals;

–9.9 dB for second adjacent-channel signals.

In Region 2, as a guide for planning, the reduction in the overall *C/I* ratio due to co-channel interference in the feeder link is taken as equivalent to a degradation in the down-link co-channel *C/I* ratio of approximately 0.5 dB not exceeded for 99% of the worst month, but the feeder-link and downlink Plans are evaluated on the basis of the overall equivalent protection margin, which includes the combined downlink and feeder-link contributions.

In Region 2, an overall equivalent protection margin of zero decibels, or greater, indicates that the individual protection ratios have been met for the co-channel, the adjacent channels and the second adjacent channels.

(MOD) 3.4.1 *Adjacent channel protection ratio template for Region 2*[2] *(FMTV into FMTV)*

NOC FIGURE 6

NOC 3.5

MOD 3.5.1 *Channel spacing in the Plans*

In Regions 1 and 3, the spacing between the assigned frequencies of two adjacent channels is 19.18 MHz.

(MOD) [1] The definitions in § 1.7, 1.8, 1.9, 1.10 and 1.11 of this Annex apply to these calculations.

MOD [2] See Annex 6 for the protection ratio template for interference between TV/FM signals in Regions 1 and 3.

In Region 2, the spacing between the assigned frequencies of two adjacent channels is 14.58 MHz, which corresponds to 32 channels in the 500 MHz bandwidth allocated to the broadcasting-satellite service.

The Plans give the assigned frequencies for each channel.

However, in the Regions 1 and 3 Plan, for the implementation of assignments different frequency spacing may be used subject to the successful application of the modification procedure of Article 4, ITU-R Recommendations for protection masks should be used if available. In the absence of such Recommendations, the Radiocommunication Bureau should apply the worst-case approach as adopted by the Radio Regulations Board.

MOD 3.5.2 *Arrangement of channels in the same beam*

Planning in Region 1 at the 1977 Conference (WARC-77) was carried out by trying to restrict all the channels radiated within a single antenna beam within a frequency range of 400 MHz, in order to simplify receiver construction. Such a restriction was considered unnecessary for the revision of the Regions 1 and 3 Plan at the 1997 World Radiocommunication Conference.

MOD 3.5.3 *Spacing between assigned channel frequencies feeding a common antenna*

In the 1977 Plan for Regions 1 and 3, owing to technical difficulties in the output circuit of a satellite transmitter, spacing between the assigned frequencies of two channels feeding a common antenna was required to be greater than 40 MHz. This restriction was not imposed in the revision of the Plan.

MOD 3.6 *Figure of merit (G/T) of a receiving station in the broadcasting-satellite service*

In planning the broadcasting-satellite service, the value of the figure of merit *G*/*T* for clear-sky conditions is:

for Regions 1 and 3:

The original 1977 broadcasting-satellite service Plan used values[1] of:

6 dB(K^{-1}) for individual reception

14 dB(K^{-1}) for community reception, *and*

for Region 2:

10 dB(K^{-1}) for individual reception.

The 1997 revision of the Regions 1 and 3 Plan is based on a uniform value of the figure of merit G/T equal to 11 dB(K^{-1}).

These values were calculated from a formula which allows for pointing error, polarization effects and equipment ageing.

See also Report ITU-R BO.473-3 (Annex 1).

NOC 3.7

MOD 3.7.1 *Half-power beamwidth of receiving antennas*

In the development of the original 1977 broadcasting-satellite service Plan for Regions 1 and 3, the minimum receiving antenna diameter was such that the half-power beamwidth was 2^o for individual reception and 1^o for community reception.

In revising this Plan at the 1997 World Radiocommunication Conference, the minimum receiving antenna diameter was such that the half-power beamwidth was 2.96^o.

For planning the broadcasting-satellite service in Region 2, the minimum receiving antenna diameter must be such that the half-power beamwidth φ_0 is 1.7°.

ADD [1] These values are still used for assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997.

MOD 3.7.2 *Receiving antenna reference patterns*

The co-polar and cross-polar receiving antenna reference patterns are given in Figures 7, 7*bis* and 8.

a) For Regions 1 and 3, the original WARC-77 Plan was based on the antenna pattern[1] shown in Figure 7 where the relative antenna gain (dB) is given by the curves for:

- individual reception, for which use should be made of:
  - Curve A for the co-polar component;
  - Curve B for the cross-polar component;
- community reception, for which use should be made of:
  - Curve A′ up to the intersection with Curve C, then Curve C, for the co-polar component;
  - Curve B for the cross-polar component.

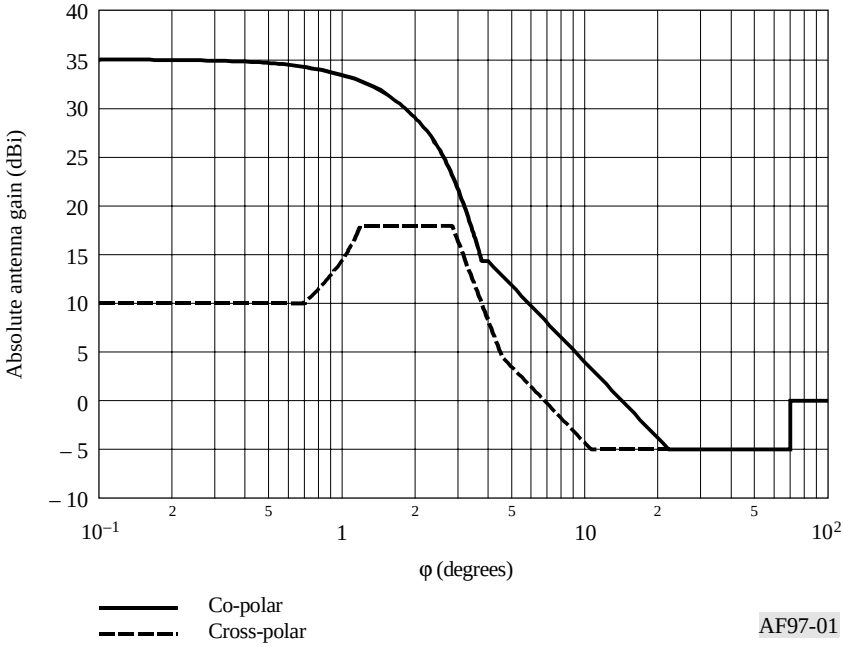
The 1997 World Radiocommunication Conference revision of the Regions 1 and 3 broadcasting-satellite service Plan was based on the absolute gain (dBi) patterns for a 60 cm antenna given in Recommendation ITU-R BO.1213 as shown in Figure 7*bis*.

b) For Region 2, the relative antenna gain (dB) is given by the curves in Figure 8 for individual reception, for which use should be made of:

- Curve A for the co-polar component;
- Curve B for the cross-polar component.

NOC FIGURE 7

ADD [1] This antenna pattern is used in the broadcasting-satellite service Plan for Regions 1 and 3 for assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997.



ADD FIGURE 7*bis*

Reference receiving earth station antenna patterns used at the 1997 World Radiocommunication Conference for revising the Regions 1 and 3 broadcasting-satellite service Plan

Co-polar pattern:

$$G_{co}(\varphi) = G_{max} - 2.5 \times 10^{-3} \left(\frac{D}{\lambda} \varphi \right)^2 \qquad \text{for} \quad 0 \le \varphi < \varphi_m$$

where

$$\varphi_m = \frac{\lambda}{D} \sqrt{\frac{G_{max} - G_1}{0.0025}}$$

$$G_{co}(\varphi) = G_1 = 29 - 25 \log \varphi_r \qquad \text{for} \qquad \varphi_m \le \varphi < \varphi_r$$

where

$$\varphi_r = 95\ \frac{\lambda}{D}$$

$G_{co}\ (\varphi) = 29 - 25 \log \varphi$ for $\varphi_r \le \varphi < \varphi_b$

where

$$\varphi_b = 10^{(34/25)}$$

$G_{co}\ (\varphi) = -5$ dBi for $\varphi_b \le \varphi < 70°$

$G_{co}\ (\varphi) = 0$ dBi for $70° \le \varphi < 180°$

Cross-polar pattern:

$G_{cross}\ (\varphi) = G_{max} - 25$ for $0 \le \varphi < 0.25\ \varphi_0$

where

$$\varphi_0 = 2\frac{\lambda}{D}\sqrt{\frac{3}{0.0025}} = 3 \text{ dB beamwidth}$$

$$G_{cross}\ (\varphi) = G_{max} - 25 + 8\left(\frac{\varphi - 0.25\ \varphi_0}{0.19\ \varphi_0}\right) \quad \text{for} \quad 0.25\ \varphi_0 \le \varphi < 0.44\ \varphi_0$$

$G_{cross}\ (\varphi) = G_{max} - 17$ for $0.44\ \varphi_0 \le \varphi < \varphi_0$

$$G_{cross}\ (\varphi) = G_{max} - 17 - 13.625\left|\frac{\varphi - \varphi_0}{\varphi_1 - \varphi_0}\right| \quad \text{for} \quad \varphi_0 \le \varphi < \varphi_1$$

where

$$\varphi_1 = \frac{\varphi_0}{2}\sqrt{10.1875}$$

$G_{cross}\ (\varphi) = 21 - 25 \log \varphi$ for $\varphi_1 \le \varphi < \varphi_2$

where

$$\varphi_2 = 10^{(26/25)}$$

$G_{cross}\ (\varphi) = -5$ dBi for $\varphi_2 \le \varphi < 70°$

$G_{cross}\ (\varphi) = 0$ dBi for $70° \le \varphi < 180°$

For the 60 cm antenna pattern which is to be used as a reference for replanning, the following parameters apply:

Co-polar:			*Cross-polar*:		
G_{max}	=	35.5 dBi			
G_1	=	13.84 dBi			
D/λ	=	23.4			
φ_m	=	3.66°	φ_0	=	2.96°
φ_r	=	4.04°	φ_1	=	4.73°
φ_b	=	$10^{(34/25)}$	φ_2	=	10.96°

NOC FIGURE 8

MOD 3.8 *Necessary bandwidth*

The necessary bandwidths considered are as follows for:

– 625-line systems in Regions 1 and 3: 27 MHz;

– 525-line systems in Region 3: 27 MHz.

However, in Regions 1 and 3, if different bandwidths are submitted, they will be treated in accordance with applicable ITU-R Recommendations for protection masks when available. In the absence of such Recommendations, the Bureau will use the worst-case approach as adopted by the Radio Regulations Board.

In Region 2, the Plan is based on a channel bandwidth of 24 MHz[1], but different bandwidths may be implemented in accordance with the provisions of this Appendix, provided that applicable ITU-R Recommendations are available. In the absence of such Recommendations, the Bureau will use the worst-case approach as adopted by the Radio Regulations Board.

[1] For France, Denmark and some of the United Kingdom requirements which use 625-line standards with greater video bandwidth, the channels shown in the Plan have a necessary bandwidth of 27 MHz. This is indicated by an appropriate symbol in the Plan.

NOC 3.9 and 3.9.1

MOD 3.9.2 For the planning of the broadcasting-satellite service, the guardbands chosen at the 1977 Conference (WARC-77) to protect the services in adjacent frequency bands are shown in the table below.

Regions	Guardband at the lower edge of the band	Guardband at the upper edge of the band
1	14 MHz	11 MHz
2	12 MHz	12 MHz
3	14 MHz	11 MHz

For Regions 1 and 3, for analogue emissions the guardbands assume a maximum beam centre e.i.r.p. of 67 dBW (value relating to individual reception), and a filter roll-off of 2 dB/MHz. If smaller e.i.r.p. values are assumed, the guardbands can be reduced in width by 0.5 MHz for each decibel decrease in e.i.r.p. The degree of possible reduction also depends on improvements in technology and on the type of modulation. However, an appropriate ITU-R Recommendation concerning the sharing requirements is not yet available.

SUP 3.9.3

NOC 3.9.4 and 3.10

MOD 3.11 *Satellite station-keeping*

Space stations in the broadcasting-satellite service must be maintained in position with an accuracy equal to or better than $\pm 0.1°$ in the E-W directions. For such space stations, the maintenance of the tolerance $\pm 0.1°$ in the N-S direction is recommended but is not a requirement.

MOD 3.12 *Elevation angle of receiving antennas*

The Plans have been based on the desirability of a minimum angle of elevation of 20° to minimize the required e.i.r.p. of the satellite and to reduce the effects of shadowing and the possibility of interference from terrestrial services. However, for areas situated in latitudes above about 60°, the angle of elevation is of necessity less than 20°. Attention is also drawn to § 2.2 for the Regions 1 and 3 Plan and to § 2.4.3 for the Region 2 Plan.

For mountainous areas where an elevation angle of 20° may not suffice, an angle of at least 30° has been provided, where possible, to provide an acceptable service. An angle of elevation of at least 40° has been considered for service areas subject to high precipitation, but exceptions were made in some cases in Region 2.

Some dry, non-mountainous areas may be given an acceptable service at angles of elevation less than 20°.

In areas with small elevation angles, the shadowing effect of tall buildings may have to be taken into account.

In choosing a satellite position designed to give the maximum angle of elevation at the ground, the influence of such a position on the eclipse period was taken into account at the 1977 Conference (WARC-77). In the revision of the Regions 1 and 3 Plan at the 1997 World Radiocommunication Conference, this influence was not considered to be a significant constraint on the choice of orbital position.

NOC 3.13

MOD 3.13.1 *Cross-section of transmitted beam*

Planning in Regions 1, 2 and 3 has been generally based on the use of satellite transmitting antennas with beams of elliptical cross-section.

If the cross-section of the emitted beam is elliptical, the effective beamwidth φ_0 is a function of the angle of rotation between the plane containing the satellite and the major axis of the beam cross-section and the plane in which the beamwidth is required.

The relationship between the maximum gain of an antenna and the half-power beamwidth can be derived from the expression:

$$G_m = \frac{27\,843}{ab}$$

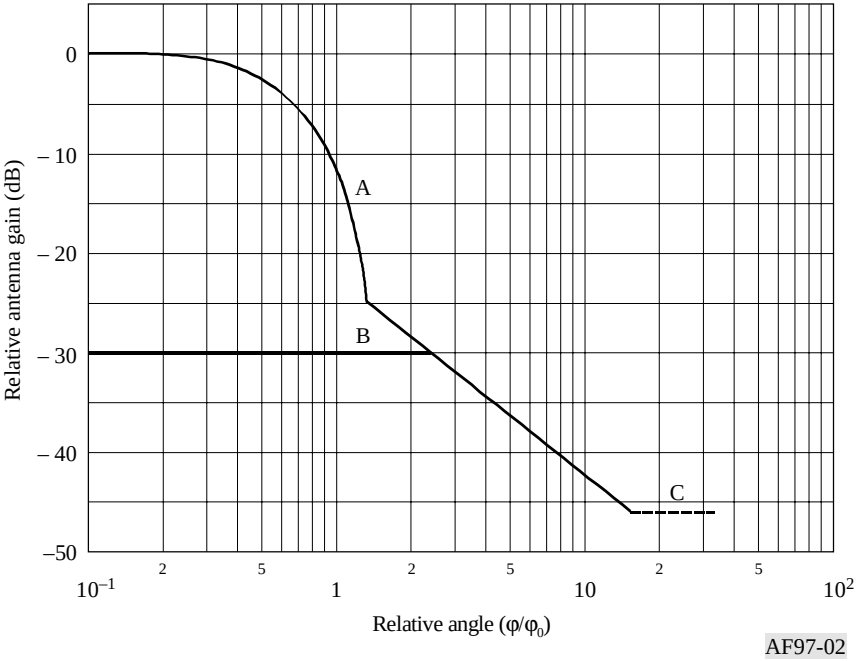
where:

a and *b* are the angles (degrees) subtended at the satellite by the major and minor axes of the elliptical cross-section of the beam; an antenna efficiency of 55% was assumed.

However, in implementing their assignments, administrations can choose beams other than elliptical, as described in Annex 2 to this Appendix, subject to successful application of the modification procedure of this Appendix.

NOC 3.13.2 and 3.13.3

NOC FIGURE 9



MOD FIGURE 10

Reference patterns for co-polar and cross-polar components for satellite transmitting antennas in Region 2

Curve A: Co-polar component (dB relative to main beam gain)

$-12\ (\varphi/\varphi_0)^2$ for $0 \le (\varphi/\varphi_0) \le 1.45$

$-(22 + 20 \log (\varphi/\varphi_0))$ for $(\varphi/\varphi_0) > 1.45$

after intersection with curve C: Curve C

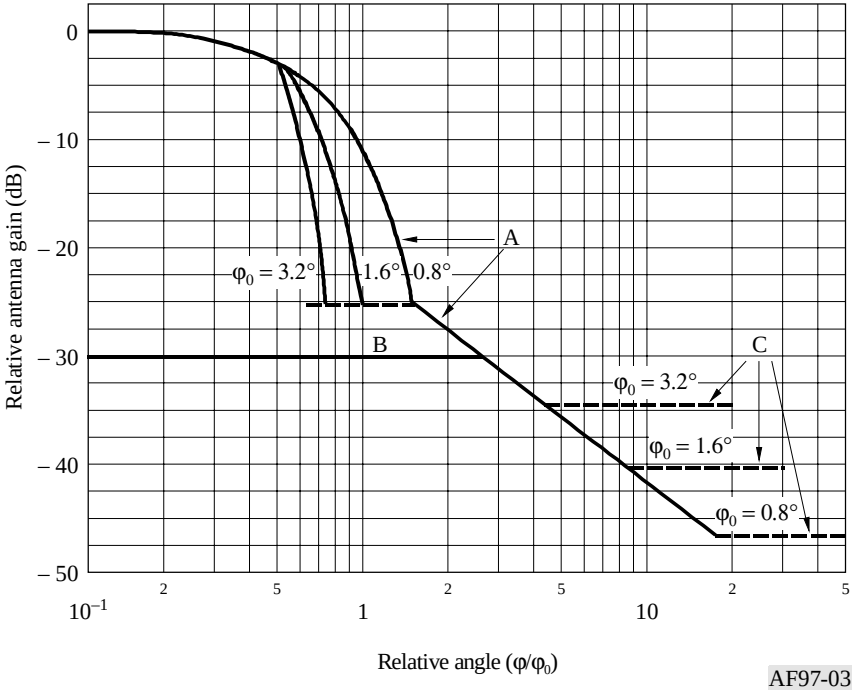
Curve B: Cross-polar component (dB relative to main beam gain)

-30 for $0 \le (\varphi/\varphi_0) \le 2.51$

after intersection with co-polar pattern: co-polar pattern

Curve C: Minus the on-axis gain (Curve C in this figure illustrates the particular case of an antenna with an on-axis gain of 46 dBi).

In Region 2, when it was necessary to reduce interference, the pattern shown in Figure 11A was used; this use is indicated in the Plan by an appropriate symbol. This pattern is derived from an antenna producing an elliptical beam with fast roll-off in the main lobe assuming a "beamlet" half-power beamwidth of 0.8^o. For Regions 1 and 3, the pattern shown in Figure 11B, based on a "beamlet" beamwidth of 0.6^o was used. Curves for three different values of φ_0 are shown as examples in Figure 11A and in Figure 11B.



MOD

FIGURE 11A

Reference patterns for co-polar and cross-copolar components for satellite transmitting antennas with roll-off in the main beam for Region 2

Curve A: Co-polar component (dB relative to main beam gain)

$-12\ (\varphi/\varphi_0)^2$ for $0 \le (\varphi/\varphi_0) \le 0.5$

$$-12\left(\frac{\frac{\varphi}{\varphi_0} - x}{\frac{B_{min}}{\varphi_0}}\right)^2 \quad \text{for} \quad 0.5 < (\varphi/\varphi_0) \le \left(\frac{1.45}{\varphi_0} B_{min} + x\right)$$

-25.23 for $\left(\frac{1.45}{\varphi_0} B_{min} + x\right) < (\varphi/\varphi_0) \le 1.45$

$-(22 + 20 \log (\varphi/\varphi_0))$ for $(\varphi/\varphi_0) > 1.45$

after intersection with curve C: Curve C

Curve B: Cross-polar component (dB relative to main beam gain)

-30 for $0 \le (\varphi/\varphi_0) < 2.51$

after intersection with co-polar pattern: co-polar pattern

Curve C: Minus the on-axis gain (Curves A and C represent examples of three antennas having different values of φ_0 as labelled in Figure 11A. The on-axis gains of these antennas are approximately 34, 40 and 46 dBi, respectively).

where:

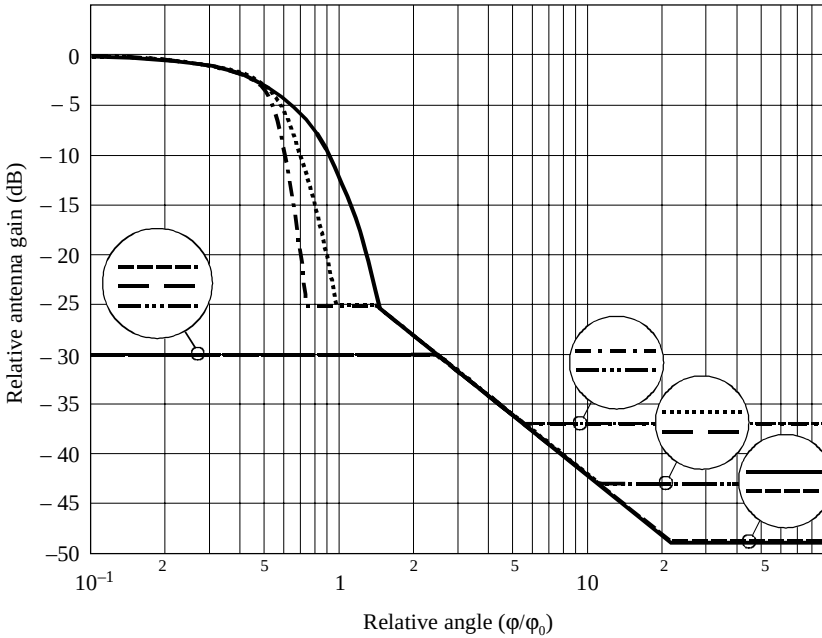
φ = off-axis angle (degrees)

φ_0 = dimension of the minimum ellipse fitted around the downlink service area in the direction of interest (degrees)

B_{min} = 0.8° for Region 2 and B_{min} = 0.6° for Regions 1 and 3

$x = 0.5\left(1 - \frac{0.8}{\varphi_0}\right)$ in Region 2

$x = 0.5\left(1 - \frac{0.6}{\varphi_0}\right)$ in Regions 1 and 3

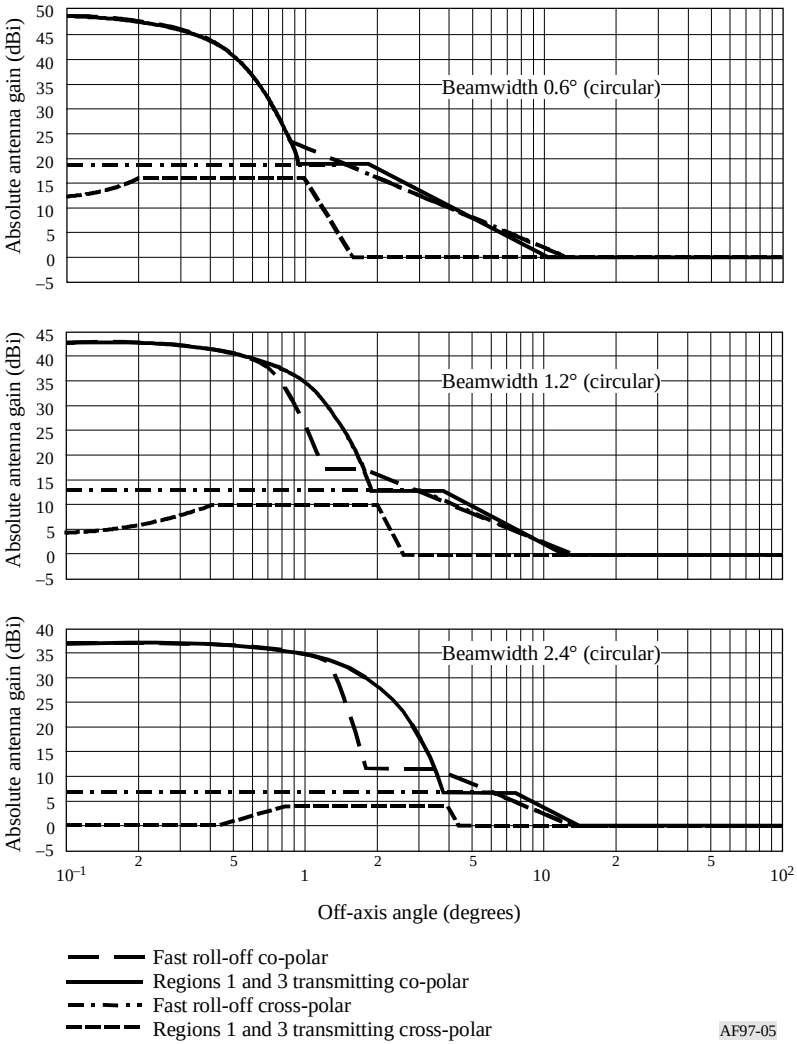


AF97-

ADD FIGURE 11B

Fast roll-off antenna for Regions 1 and 3 Plan revision (beamlet beamwidth of 0.6°)

ADD The difference in performance between the fast roll-off satellite transmitting antenna and the reference satellite transmitting antenna for Regions 1 and 3 is shown in Figure 12.



ADD FIGURE 12

Comparison between fast roll-off and Regions 1 and 3 reference satellite transmitting antennas

NOC 3.14

MOD 3.14.1 The deviation of the antenna beam from its nominal pointing direction must not exceed a limit of 0.1° in any direction. Moreover, the angular rotation of a transmitting beam about its axis must not exceed a limit of ±1°; the limit on rotation is not necessary for beams of circular cross-section using circular polarization[1].

NOC 3.14.2 to 3.15

MOD 3.16 *Power flux-density at edge of coverage area*

The original 1977 broadcasting-satellite service Plan used the following values[2] of the power flux-density at the edge of the coverage area exceeded for 99% of the worst month:

– 103 dB(W/m^2) for individual reception in Regions 1 and 3;

– 107 dB(W/m^2) for individual reception in Region 2 for 24 MHz, as well as for 27 MHz with respect to the cases mentioned in the footnote to § 3.8.

– 111 dB(W/m^2) for community reception in Regions 1 and 3.

The 1997 revision of the Regions 1 and 3 Plan was generally based on a uniform value of the power flux-density at the edge of coverage area equal to –108 dB(W/m^2). This corresponds to the general reduction in e.i.r.p. of 5 dB referenced to the average e.i.r.p. of 63.9 dBW in the 1977 broadcasting-satellite service Plan.

ADD [1] In the original 1977 broadcasting-satellite service Plan for Regions 1 and 3, the angular rotation of a transmitting beam about its axis must not exceed a limit of ±2°. This limit is still applied for assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997.

ADD [2] These values are still used for assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997.

NOC 3.17

MOD 3.18 *Use of energy dispersal*

For planning, an energy dispersal value has been adopted which reduces by 22 dB the spectral power flux-density measured in a 4 kHz bandwidth in relation to that measured in the entire bandwidth: For frequency-modulated television signals, this reduction corresponds to a peak-to-peak deviation of 600 kHz. Digital modulation can achieve appropriate energy dispersal by proper implementation of digital modulation (e.g. by applying spectrum scrambling and/or interleaving).

ANNEX 6

Criteria for Sharing Between Services

1. Protection requirements for sharing between services in the 12 GHz band

NOC 1.1 to 1.4

MOD 1.5 The specified values of protection ratio (i.e. the carrier-to-interference power ratio corresponding to a specified picture quality) are applicable, for planning purposes, to television signals of any of the several television standards.

Wanted service[1]	Wanted signal[1]	Interfering service[1]	Interfering signal[1]	Protection requirements[2]	
				Total acceptable[3]	Single entry
BSS	TV/FM	BSS, FSS, FS, BS	TV/FM	C/I = 30 dB[4, 7]	C/I = 35 dB[4]
FSS	FDM/FM	BSS	TV/FM	N = 500 pWOp [8]	N = 300 pWOp
FSS	TV/FM	BSS, FSS	TV/FM	C/I = 32 dB [5]	C/I = 37 dB[5]
FSS	4φ-PSK	BSS, FSS	TV/FM	C/I = 30 dB	C/I = 35 dB
FSS	FDM/FM	FSS	FDM/FM	N = 1000 pWOp	N = 400 pWOp
FS	FDM/FM	BSS	TV/FM	N = 1000 pWOp	–125 dB(W/m^2/4 kHz) [6]
BS	TV/VSB	BSS	TV/FM	C/I = 50 dB	not applicable

NOTES: [1] BSS = broadcasting-satellite service; FSS = fixed-satellite service; BS = broadcasting service; FS = fixed service; TV = television; FM = frequency modulation; FDM = frequency division multiplex; 4φ-PSK = four-level phase shift keying; VSB = vestigial sideband.

[2] These limits include both up-link and down-link contributions.

[3] Values in dB are protection ratios for the sum of interfering signals. Values in pWOp represent interference noise in the worst telephone channels caused by the sum of interfering signals.

[4] For BSS satellites located at the interfaces of the Regions 1 and 3 Plan and the Region 2 Plan, the C/I ratios should be 1 dB higher.

[5] See Recommendation ITU-R S.483-3.

[6] This value may be suitably modified for tropical regions to take account of rain attenuation. Allowance may also be made for polarization discrimination.

[7] C/I = ratio of carrier-to-interfering signal.

[8] N = noise power.

NOC 1.6 and 1.6 *a)*

MOD 1.6 *b)* quality of the wanted service (grade 4.5)[1];

NOC 1.6 *c)* to 1.8

2. Reference antenna diameter for a fixed-satellite earth station to be used in calculating interference from space stations in the broadcasting-satellite service

MOD 2.1 For antennas larger than 100 λ (2.5 m) in the fixed-satellite service, the gain of the side-lobes is given by the expression $32 - 25 \log \theta$, where θ is the angle from the boresight (Recommendation ITU-R S.465-5). The side-lobe gain is independent of antenna diameter.

NOC 2.2 to 3.4

NOC ANNEX 7

MOD [1] Impairment grade on a 5-point scale as defined in Recommendation ITU-R BT.500-7.

APPENDIX S30A

Provisions and Associated Plans for Feeder Links for the Broadcasting-Satellite Service (11.7-12.5 GHz in Region 1, 12.2-12.7 GHz in Region 2 and 11.7-12.2 GHz in Region 3) in the Frequency Bands 14.5-14.8 GHz [1] and 17.3-18.1 GHz in Regions 1 and 3, and 17.3-17.8 GHz in Region 2

NOC ARTICLE 1

NOC ARTICLE 2

ARTICLE 3

Execution of the Provisions and Associated Plans

(MOD) 3.1 The Member States of the Union in Regions 1, 2 and 3 shall adopt, for their feeder-link space and earth stations in the fixed-satellite service (Earth-to-space) in the frequency bands referred to in this Appendix, the characteristics specified in the appropriate Regional Plan and the associated provisions.

(MOD) 3.2 The Member States of the Union shall not change the characteristics specified in the Region 1 and Region 3 Plans or in the Region 2 Plan, or bring into use assignments to receiving space stations or transmitting earth stations in

[1] This use of the band 14.5-14.8 GHz is reserved for countries outside Europe.

the fixed-satellite service or to stations of the other services to which these frequency bands are allocated, except as provided for in the Radio Regulations and the appropriate Articles and Annexes of this Appendix.

NOC 3.3

ARTICLE 4

Procedure for Modifications to the Plans

(MOD) 4.1 When an administration intends to make a modification to one of the Regional Plans, i.e. either:

a) to modify the characteristics of any of its frequency assignments in the fixed-satellite service which are shown in the appropriate Regional Plan, or for which the procedure in this Article has been successfully applied, whether or not the station has been brought into use; *or*

b) to include in the Plan a new frequency assignment in the fixed-satellite service; *or*

c) to cancel a frequency assignment in the fixed-satellite service,

the following procedure shall be applied before any notification of the frequency assignment is made to the Radiocommunication Bureau (see Article 5 of this Appendix and Resolution **42 (Rev.Orb-88)**).

MOD 4.1.1 Before an administration proposes to include in the Plan, under the provisions of § 4.1 *b)*, a new frequency assignment to a space station or to include in the Plan new frequency assignments to a space station whose orbital position is not designated in the Plan for this administration, all the assignments to the service area involved should have been brought into service or have been notified to the Bureau in accordance with the relevant provisions of the Plan.

NOC 4.2 to 4.2.1.1

(MOD) 4.2.1.2 having a frequency assignment in the band 17.7-18.1 GHz to an earth station in the fixed-satellite service (space-to-Earth), which is recorded in the Master Register or which has been coordinated or is being coordinated under the provisions of No. **S9.7** of the Radio Regulations and which is located within the coordination area of the feeder-link fixed-satellite earth station; *or*

NOC 4.2.1.3 to 4.2.3.1

(MOD) 4.2.3.2 having a frequency assignment in the band 17.7-17.8 GHz to an earth station in the fixed-satellite service (space-to-Earth), which is recorded in the Master Register or which has been coordinated or is being coordinated under the provisions of No. **S9.7** of the Radio Regulations and which is located within the coordination area of the feeder-link fixed-satellite earth station; *or*

NOC 4.2.3.3 to 4.4.2

ARTICLE 5

Coordination, Notification, Examination and Recording in the Master International Frequency Register of Frequency Assignments to Feeder-Link Transmitting Earth Stations and Receiving Space Stations in the Fixed-Satellite Service

NOC 5.1 to 5.1.4

MOD 5.1.5 If an administration with which coordination is sought under § 5.1.4 does not respond within three months, the administration intending to bring into use a frequency assignment to a feeder-link earth station shall notify this frequency assignment in accordance with § 5.1.2 above.

NOC 5.1.6 to 5.2

MOD 5.2.1 The Bureau shall examine each notice:

a) with respect to its conformity with the Convention and the relevant provisions of the Radio Regulations (with the exception of those relating to § *b), c), d)* and *e)* below); *and*

b) with respect to its conformity with the appropriate Regional Plan; *or*

c) with respect to its conformity with the appropriate Regional Plan, however, having characteristics differing from those in the Plan in one or more of the following aspects:

– use of a reduced e.i.r.p.,

– use of a reduced coverage area entirely situated within the coverage area appearing in the Plan,

– use of other modulating signals in accordance with the provisions of § 3.1.3 to Annex 5 of Appendix **S30**,

– in the case of Region 2, use of an orbital position under the conditions specified in § B. of Annex 7 to Appendix **S30**,

– in the case of Regions 1 and 3, use of an orbital position under the conditions specified in § 3.15 of Annex 3 to Appendix **S30A**[1],

NOC 5.2.1 *d)* to 5.3.2

NOC ARTICLE 6

NOC ARTICLE 7

NOC ARTICLE 8

NOC ARTICLE 9

MOD ARTICLE 9A

Plan for Feeder Links for the Broadcasting-Satellite Service in the Fixed-Satellite Service in the Frequency Bands 14.5-14.8 GHz and 17.3-18.1 GHz in Regions 1 and 3

9A.1 COLUMN HEADINGS OF THE PLAN

Col. 1. *Notifying administration symbol*.

Col. 2. *Beam identification* (Column 2, normally, contains the symbol designating the country or the geographical area taken from Table B1 of the Preface to the International Frequency List, followed by the symbol designating the service area).

Col. 3. *Nominal orbital position*, in degrees and hundredths of a degree from the Greenwich meridian (negative values indicate longitudes which are west of the Greenwich meridian; positive values indicate longitudes which are east of the Greenwich meridian).

Col. 4. *Channel number*.

Col. 5. *Assigned frequency*, in MHz.

Col. 6. *Nominal intersection of the beam axis with the Earth* (boresight or aim point in the case of a non-elliptical beam), longitude and latitude, in degrees and hundredths of a degree.

Col. 7. *Space station receiving antenna characteristics* (elliptical beams). This column contains three numerical values corresponding to the major axis, the minor axis and the major axis orientation respectively of the elliptical cross-section half-power beam, in degrees and hundredths of a degree. Orientation of the ellipse determined as follows: in a plane normal to the beam axis, the direction of a major axis of the ellipse is specified as the angle measured anticlockwise from a line parallel to the equatorial plane to the major axis of the ellipse, to the nearest degree.

Col. 8. S*pace station receiving antenna pattern code*.

Col. 9. *Space station receiving antenna shaped (non-elliptical) beam identification.*

Col. 10. *Maximum space station receiving antenna co-polar and cross-polar (in the case of shaped beam) isotropic gain*, in dBi.

Col. 11. *Earth station transmitting antenna pattern code*.

Col. 12. *Polarization* (CL - circular left, CR - circular right, LE - linear referenced to the equatorial plane) and polarization angle in degrees and hundredths of a degree (in the case of linear polarization only).

Col. 13. *e.i.r.p.* in the direction of maximum radiation, in dBW.

Col. 14. *Permitted increase in earth station e.i.r.p.* in dB for the purpose of power control (see § 3.11 of Annex 3 to this Appendix)[1] .

Col. 15. *Designation of emission*.

---

[1] Because the applicable versions of ITU-R Recommendations relating to propagation loss due to rain and depolarization have not been defined, the power-control values will be calculated after WRC-97.

Col. 16. *Identity of the space station*.

Col. 17. *Group code* (An identification code which indicates that all assignments with the same group identification code will be treated as a group.)

Col. 18. *Assignment status*.

Col. 19. *Remarks*.

The codes used for the antenna pattern of the receiving space station (feeder link) antenna are defined as follows:

R13RSS	Figure B and § 3.7.3 in Annex 3 of Appendix **S30A**
R123FR	Figure C and § 3.7.3 in Annex 3 of Appendix **S30A**
MODRSS	Recommendation ITU-R BO.1296

In cases where the “Space station receiving antenna pattern code” field is blank, the necessary antenna pattern data are provided by shaped beam data submitted by the administration. These data are stored in column 8. A particular shaped beam is identified by the combination of column 1, column 9 and column 16. In such cases the maximum cross-polar gain is given in column 10, “Cross-polar gain” field.

The codes used for transmitting earth station (feeder-link) antenna patterns are defined as follows:

R13TES	Figure A and § 3.5.3 in Annex 3 of Appendix **S30A**
MODTES	Recommendation ITU-R BO.1295

The assignment status codes used for beams are defined as follows:

P	Assignment in the Plan for which § 4.2.5 (in terms of 8 years lapsing period) of this Appendix does not apply.
PE	Assignment in the Plan for which § 4.2.5 (in terms of 8 years lapsing period) of this Appendix does not apply. These assignments have been notified and brought into use and the date of bringing into use has been confirmed to the Bureau. For this category of assignments, the parameters in force before WRC-97 are applied.
A	Assignment in the Plan for which § 4.2.5 (in terms of 8 years lapsing period) of this Appendix applies.
AE	Assignment in the Plan for which § 4.2.5 (in terms of 8 years lapsing period) of this Appendix applies. These assignments have been notified and brought into use and the date of bringing into use has been confirmed to the Bureau. For this category of assignments, parameters in force before WRC-97 are applied.

Group code: If an assignment is part of the group:

a) The equivalent protection margin to be used for the application of Article 4 of this Appendix shall be calculated on the following basis:

– for the calculation of interference to assignments that are part of a group, only the interference contributions from assignments that are not part of the same group are to be included; *and*

– for the calculation of interference from assignments belonging to a group of assignments that are not part of that same group, only the worst interference contribution from that group shall be used on a test point to test point basis.

b) If an administration notifies the same frequency in more than one beam of a group for use at the same time, the aggregate carrier-to-interference (*C/I*) ratio produced by all emissions from that group shall not exceed the *C/I* ratio calculated on the basis of § *a)* above.

9A.2 TEXT FOR SYMBOLS IN REMARKS COLUMN OF THE PLAN

1. India may also locate feeder-link earth stations near the point 29° N, 77.3° E, on condition that this does not affect the equivalent protection margins of other administrations.

2. Germany and Switzerland have agreed that their feeder-link channels can be interchanged for a limited period of time ending in the year 2001, as follows:

2 with 22, 6 with 26, 10 with 30, 14 with 34, 18 with 38.

3. Before an administration notifies to the Bureau or brings into use this frequency assignment to a transmitting feeder-link earth station in the band 17.7-18.1 GHz, it shall effect coordination of this assignment, using the method described in Annex 4 of Appendix **S30A**, in respect of a specific earth station in the fixed-satellite service (space-to-Earth) in the band 17.7-18.1 GHz:

a) either recorded in the Master Register prior to 27 October 1997 with a favourable finding; or

b) for which a notice is received by the Bureau prior to 27 October 1997 for recording in the Master Register and which subsequently receives a favourable finding based on the Plan as it existed on 27 October 1997.

4. Before an administration notifies to the Bureau or brings into use this frequency assignment to a transmitting feeder-link earth station in the bands 14.5-14.8 GHz and 17.7-18.1 GHz, it shall effect coordination of this assignment with each administration whose territory lies wholly or partly within the coordination area of the feeder-link earth station, using the method described in Appendix **S7**, in respect of stations of the fixed and mobile services in the bands 14.5-14.8 GHz and 17.7-18.1 GHz:

a) either recorded in the Master Register prior to 27 October 1997 with a favourable finding; or

b) for which a notice is received by the Bureau prior to 27 October 1997 for recording in the Master Register and which subsequently receives a favourable finding based on the Plan as it existed on 27 October 1997.

5. This assignment shall be brought into use only when the limits given in § 5. of Annex 1 are not exceeded, or with the agreement of administrations identified in Table 1A with respect to assignments which are in conformity with the Region 2 Plan on 27 October 1997.

These administrations shall be informed by the notifying administration of changes in characteristics before these beams are brought into use.

6. This assignment shall not claim protection from the assignments of the administrations indicated in Table 1B which are in conformity with the Region 2 Plan on 27 October 1997.

7. This assignment shall not claim protection from the assignments of the administrations indicated in Table 1B which are recorded in the Master Register with a favourable finding prior to 27 October 1997 to which No. **S5.487/838** and No. **S5.43/435** of the Radio Regulations do not apply.

8. Provisional beam. This assignment has been included in the Plan by WRC-97. This assignment is for exclusive use by Palestine, subject to the Israeli-Palestinian Interim Agreement of 28 September 1995, Resolution 741 of the ITU Council notwithstanding.

9. Pending clarification of bringing into service of the satellite network.

TABLE 1A

Beam name	Channels	Affected administrations*
G 02700	4, 8, 12	GUY JMC
IRL21100	2, 10	GUY JMC
	6	JMC
LBR24400	3	JMC
	7, 11	GUY JMC

TABLE 1B

Beam name	Channels	Affecting administrations**
AZR13400	28, 36, 40	USA
BFA10700	29, 37	USA
CNR13000	27, 39	USA
CTI23700	26, 38	USA
D2-21600	21, 25, 29, 33, 37	USA/IT
G 02700	4, 8, 12	GUY JMC
HISPASA2	27, 29, 37, 39	USA
IRL21100	2, 10	GUY JMC
	6	JMC
KAZ06600	24, 32	F/EUT
	28, 36, 40	F/EUT USA
KGZ07000	22, 30, 34	F/EUT
	26, 38	F/EUT USA
LBR24400	3	JMC
	7, 11	GUY JMC

* Administrations whose assignment(s) may receive interference from the beam shown in the left-hand column.

** Administrations whose assignment(s) may cause interference to the beam shown in the left-hand column.

TABLE 1B (*end*)

Beam name	Channels	Affecting administrations**
MDA06300	20	G PAK
MLT1470A	20	F/EUT USA
NPL1220A	23	IND
RUS00400	39	USA
TKM06800	23, 27, 31, 35	F/EUT
	39	F/EUT USA

TABLE 2A

Table showing correspondence between channel numbers and assigned frequencies for the feeder links in the frequency band 14.5-14.8 GHz

Channel No.	Assigned feeder-link frequency (MHz)
1	14 525.30
2	14 544.48
3	14 563.66
4	14 582.84
5	14 602.02
6	14 621.20
7	14 640.38
8	14 659.56
9	14 678.74
10	14 697.92
11	14 717.10
12	14 736.28
13	14 755.46
14	14 774.64

** Administrations whose assignment(s) may cause interference to the beam shown in the left-hand column.

TABLE 2B

Table showing correspondence between channel numbers and assigned frequencies for the feeder links in the frequency band 17.3 GHz-18.1 GHz

Channel No.	Assigned feeder-link frequency (MHz)	Channel No.	Assigned feeder-link frequency (MHz)
1	17 327.48	21	17 711.08
2	17 346.66	22	17 730.26
3	17 365.84	23	17 749.44
4	17 385.02	24	17 768.62
5	17 404.20	25	17 787.80
6	17 423.38	26	17 806.98
7	17 442.56	27	17 826.16
8	17 461.74	28	17 845.34
9	17 480.92	29	17 864.52
10	17 500.10	30	17 883.70
11	17 519.28	31	17 902.88
12	17 538.46	32	17 922.06
13	17 557.64	33	17 941.24
14	17 576.82	34	17 960.42
15	17 596.00	35	17 979.60
16	17 615.18	36	17 998.78
17	17 634.36	37	18 017.96
18	17 653.54	38	18 037.14
19	17 672.72	39	18 056.32
20	17 691.90	40	18 075.50

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
AFS	AFS02100	5.00	1	14525.30	24.50	-28.00	3.13	1.68	27.00	MODRSS		37.24		MODTES	CR		82.00		27M0F8W			P	
ARS	ARS34001	17.00	1	14525.30	44.60	23.40	4.21	2.48	145.00	MODRSS		34.26		MODTES	CR		82.00		27M0F8W			P	
IND	IND04301	56.00	1	14525.30	77.80	11.10	1.36	1.28	172.00	MODRSS		42.04		MODTES	CL		82.00		27M0F8W			P	1
IND	IND04401	68.00	1	14525.30	79.50	22.30	2.19	1.42	146.00	MODRSS		39.52		MODTES	CL		82.00		27M0F8W			P	1
ISR	ISR11000	-13.00	1	14525.30	34.90	31.40	0.94	0.60	117.00	MODRSS		46.93		MODTES	CL		82.00		27M0F8W			P	
MRC	MRC20900	-25.00	1	14525.30	-8.90	28.90	3.96	1.55	50.00	MODRSS		36.57		MODTES	CR		82.00		27M0F8W			P	
NMB	NMB02500	-19.00	1	14525.30	17.50	-21.60	2.66	1.90	48.00	MODRSS		37.41		MODTES	CR		82.00		27M0F8W			P	
YEM	YEM26700	11.00	1	14525.30	48.61	14.42	1.68	1.44	157.35	MODRSS		40.61		MODTES	CR		82.00		27M0F8W			P	4
CPV	CPV30100	-30.00	2	14544.48	-24.00	16.00	0.86	0.70	144.00	MODRSS		46.65		MODTES	CR		82.00		27M0F8W			P	4
ETH	ETH09200	23.00	2	14544.48	40.35	9.19	2.66	2.23	166.11	MODRSS		36.72		MODTES	CR		82.00		27M0F8W			P	4
IND	IND04501	56.00	2	14544.48	76.20	19.50	1.58	1.58	21.00	MODRSS		40.47		MODTES	CR		82.00		27M0F8W			P	1
IND	IND04801	68.00	2	14544.48	86.20	25.00	1.56	0.90	120.00	MODRSS		42.97		MODTES	CR		82.00		27M0F8W			P	1
KOR	KO11201D	116.00	2	14544.48	127.50	36.00	1.24	1.02	168.00	R13RSS		43.40		R13TES	CL		82.00		27M0G7W	KOREASAT-1	20	AE	4
KOR	KOR11201	116.00	2	14544.48	127.50	36.00	1.24	1.02	168.00	R13RSS		43.40		R13TES	CL		82.00		27M0F8W	KOREASAT-1	20	AE	4
MOZ	MOZ30700	-1.00	2	14544.48	34.00	-18.00	3.57	1.38	55.00	MODRSS		37.52		MODTES	CR		82.00		27M0F8W			P	
NIG	NIG11900	-19.00	2	14544.48	7.80	9.40	2.16	2.02	45.00	MODRSS		38.05		MODTES	CL		82.00		27M0F8W			P	
PAK	PAK12701	38.00	2	14544.48	69.60	29.50	2.30	2.16	14.00	MODRSS		37.49		MODTES	CL		82.00		27M0F8W			P	
PNG	PNG13100	110.00	2	14544.48	147.70	-6.30	2.50	2.18	169.00	MODRSS		37.08		MODTES	CL		89.00		27M0F8W			P	
SNG	SNG15100	74.00	2	14544.48	103.80	1.30	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		82.00		27M0F8W			P	
STP	STP24100	-13.00	2	14544.48	7.00	0.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		82.00		27M0F8W			P	
TGO	TGO22600	-25.00	2	14544.48	0.80	8.60	1.52	0.60	105.00	MODRSS		44.85		MODTES	CR		82.00		27M0F8W			P	
UGA	UGA05100	11.00	2	14544.48	32.30	1.20	1.46	1.12	60.00	MODRSS		42.31		MODTES	CL		82.00		27M0F8W			P	
IND	IND03801	56.00	3	14563.66	75.90	33.40	1.52	1.08	33.00	MODRSS		42.29		MODTES	CL		82.00		27M0F8W			P	1
IND	IND04701	68.00	3	14563.66	93.30	11.10	1.92	0.60	96.00	MODRSS		43.83		MODTES	CL		82.00		27M0F8W			P	1
IRN	IRN10901	34.00	3	14563.66	54.20	32.40	3.82	1.82	149.00	MODRSS		36.03		MODTES	CR		82.00		27M0F8W			P	
YEM	YEM26700	11.00	3	14563.66	48.61	14.42	1.68	1.44	157.35	MODRSS		40.61		MODTES	CR		82.00		27M0F8W			P	4
ZMB	ZMB31400	-1.00	3	14563.66	27.50	-13.10	2.38	1.48	39.00	MODRSS		38.98		MODTES	CL		82.00		27M0F8W			P	
ARS	ARS00301	17.00	4	14582.84	44.60	23.40	4.21	2.48	145.00	MODRSS		34.26		MODTES	CL		82.00		27M0F8W			P	
CPV	CPV30100	-30.00	4	14582.84	-24.00	16.00	0.86	0.70	144.00	MODRSS		46.65		MODTES	CR		82.00		27M0F8W			P	4
IND	IND04001	56.00	4	14582.84	73.00	25.00	1.82	1.48	58.00	MODRSS		40.14		MODTES	CR		82.00		27M0F8W			P	1
IND	IND04201	68.00	4	14582.84	79.30	27.70	2.14	1.16	147.00	MODRSS		40.50		MODTES	CR		82.00		27M0F8W			P	1
KOR	KO11201D	116.00	4	14582.84	127.50	36.00	1.24	1.02	168.00	R13RSS		43.40		R13TES	CL		82.00		27M0G7W	KOREASAT-1	20	AE	4
KOR	KOR11201	116.00	4	14582.84	127.50	36.00	1.24	1.02	168.00	R13RSS		43.40		R13TES	CL		82.00		27M0F8W	KOREASAT-1	20	AE	4
MOZ	MOZ30700	-1.00	4	14582.84	34.00	-18.00	3.57	1.38	55.00	MODRSS		37.52		MODTES	CR		82.00		27M0F8W			P	
NIG	NIG11900	-19.00	4	14582.84	7.80	9.40	2.16	2.02	45.00	MODRSS		38.05		MODTES	CL		82.00		27M0F8W			P	
PAK	PAK28301	38.00	4	14582.84	74.70	33.90	1.34	1.13	160.00	MODRSS		42.65		MODTES	CL		82.00		27M0F8W			P	
PNG	PNG27100	128.00	4	14582.84	148.00	-6.70	2.80	2.05	155.00	MODRSS		36.86		MODTES	CL		89.00		27M0F8W			P	
STP	STP24100	-13.00	4	14582.84	7.00	0.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		82.00		27M0F8W			P	
TGO	TGO22600	-25.00	4	14582.84	0.80	8.60	1.52	0.60	105.00	MODRSS		44.85		MODTES	CR		82.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
UGA	UGA05100	11.00	4	14582.84	32.30	1.20	1.46	1.12	60.00	MODRSS		42.31		MODTES	CL		82.00		27M0F8W			P	
AFS	AFS02100	5.00	5	14602.02	24.50	-28.00	3.13	1.68	27.00	MODRSS		37.24		MODTES	CR		82.00		27M0F8W			P	
IND	IND03901	56.00	5	14602.02	72.70	11.20	1.26	0.60	107.00	MODRSS		45.66		MODTES	CL		82.00		27M0F8W			P	1
IND	IND04601	68.00	5	14602.02	84.70	20.50	1.60	0.86	30.00	MODRSS		43.06		MODTES	CL		82.00		27M0F8W			P	1
ISR	ISR11000	-13.00	5	14602.02	34.90	31.40	0.94	0.60	117.00	MODRSS		46.93		MODTES	CL		82.00		27M0F8W			P	
MRC	MRC20900	-25.00	5	14602.02	-8.90	28.90	3.96	1.55	50.00	MODRSS		36.57		MODTES	CR		82.00		27M0F8W			P	
NMB	NMB02500	-19.00	5	14602.02	17.50	-21.60	2.66	1.90	48.00	MODRSS		37.41		MODTES	CR		82.00		27M0F8W			P	
YEM	YEM26700	11.00	5	14602.02	48.61	14.42	1.68	1.44	157.35	MODRSS		40.61		MODTES	CR		82.00		27M0F8W			P	4
ZMB	ZMB31400	-1.00	5	14602.02	27.50	-13.10	2.38	1.48	39.00	MODRSS		38.98		MODTES	CL		82.00		27M0F8W			P	
CPV	CPV30100	-30.00	6	14621.20	-24.00	16.00	0.86	0.70	144.00	MODRSS		46.65		MODTES	CR		82.00		27M0F8W			P	4
ETH	ETH09200	23.00	6	14621.20	40.35	9.19	2.66	2.23	166.11	MODRSS		36.72		MODTES	CR		82.00		27M0F8W			P	4
IND	IND03701	68.00	6	14621.20	93.00	25.50	1.46	1.13	40.00	MODRSS		42.27		MODTES	CR		82.00		27M0F8W			P	1
IND	IND04101	56.00	6	14621.20	78.40	16.00	2.08	1.38	35.00	MODRSS		39.87		MODTES	CR		82.00		27M0F8W			P	1
KOR	KO11201D	116.00	6	14621.20	127.50	36.00	1.24	1.02	168.00	R13RSS		43.40		R13TES	CL		82.00		27M0G7W	KOREASAT-1	20	AE	4
KOR	KOR11201	116.00	6	14621.20	127.50	36.00	1.24	1.02	168.00	R13RSS		43.40		R13TES	CL		82.00		27M0F8W	KOREASAT-1	20	AE	4
MOZ	MOZ30700	-1.00	6	14621.20	34.00	-18.00	3.57	1.38	55.00	MODRSS		37.52		MODTES	CR		82.00		27M0F8W			P	
NIG	NIG11900	-19.00	6	14621.20	7.80	9.40	2.16	2.02	45.00	MODRSS		38.05		MODTES	CL		82.00		27M0F8W			P	
PAK	PAK12701	38.00	6	14621.20	69.60	29.50	2.30	2.16	14.00	MODRSS		37.49		MODTES	CL		82.00		27M0F8W			P	
PNG	PNG13100	110.00	6	14621.20	147.70	-6.30	2.50	2.18	169.00	MODRSS		37.08		MODTES	CL		89.00		27M0F8W			P	
SNG	SNG15100	74.00	6	14621.20	103.80	1.30	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		82.00		27M0F8W			P	
STP	STP24100	-13.00	6	14621.20	7.00	0.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		82.00		27M0F8W			P	
TGO	TGO22600	-25.00	6	14621.20	0.80	8.60	1.52	0.60	105.00	MODRSS		44.85		MODTES	CR		82.00		27M0F8W			P	
UGA	UGA05100	11.00	6	14621.20	32.30	1.20	1.46	1.12	60.00	MODRSS		42.31		MODTES	CL		82.00		27M0F8W			P	
AFS	AFS02100	5.00	7	14640.38	24.50	-28.00	3.13	1.68	27.00	MODRSS		37.24		MODTES	CR		82.00		27M0F8W			P	
IND	IND04301	56.00	7	14640.38	77.80	11.10	1.36	1.28	172.00	MODRSS		42.04		MODTES	CL		82.00		27M0F8W			P	1
IND	IND04601	68.00	7	14640.38	84.70	20.50	1.60	0.86	30.00	MODRSS		43.06		MODTES	CL		82.00		27M0F8W			P	1
IRN	IRN10901	34.00	7	14640.38	54.20	32.40	3.82	1.82	149.00	MODRSS		36.03		MODTES	CR		82.00		27M0F8W			P	
ISR	ISR1100A	-13.00	7	14640.38	34.90	31.40	0.94	0.60	117.00	MODRSS		46.93		MODTES	CL		82.00		27M0F8W			P	4
MRC	MRC20900	-25.00	7	14640.38	-8.90	28.90	3.96	1.55	50.00	MODRSS		36.57		MODTES	CR		82.00		27M0F8W			P	
SEN	SEN22201	-37.00	7	14640.38	-14.40	13.80	1.46	1.04	139.00	MODRSS		42.63		MODTES	CR		82.00		27M0F8W			P	
YEM	YEM26700	11.00	7	14640.38	48.61	14.42	1.68	1.44	157.35	MODRSS		40.61		MODTES	CR		82.00		27M0F8W			P	4
ZMB	ZMB31400	-1.00	7	14640.38	27.50	-13.10	2.38	1.48	39.00	MODRSS		38.98		MODTES	CL		82.00		27M0F8W			P	
CPV	CPV30100	-30.00	8	14659.56	-24.00	16.00	0.86	0.70	144.00	MODRSS		46.65		MODTES	CR		82.00		27M0F8W			P	4
ETH	ETH09200	23.00	8	14659.56	40.35	9.19	2.66	2.23	166.11	MODRSS		36.72		MODTES	CR		82.00		27M0F8W			P	4
IND	IND04101	56.00	8	14659.56	78.40	16.00	2.08	1.38	35.00	MODRSS		39.87		MODTES	CR		82.00		27M0F8W			P	1
IND	IND04801	68.00	8	14659.56	86.20	25.00	1.56	0.90	120.00	MODRSS		42.97		MODTES	CR		82.00		27M0F8W			P	1
KOR	KO11201D	116.00	8	14659.56	127.50	36.00	1.24	1.02	168.00	R13RSS		43.40		R13TES	CL		82.00		27M0G7W	KOREASAT-1	20	AE	4
KOR	KOR11201	116.00	8	14659.56	127.50	36.00	1.24	1.02	168.00	R13RSS		43.40		R13TES	CL		82.00		27M0F8W	KOREASAT-1	20	AE	4
MOZ	MOZ30700	-1.00	8	14659.56	34.00	-18.00	3.57	1.38	55.00	MODRSS		37.52		MODTES	CR		82.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
NIG	NIG11900	-19.00	8	14659.56	7.80	9.40	2.16	2.02	45.00	MODRSS		38.05		MODTES	CL		82.00		27M0F8W			P	
PAK	PAK28301	38.00	8	14659.56	74.70	33.90	1.34	1.13	160.00	MODRSS		42.65		MODTES	CL		82.00		27M0F8W			P	
PNG	PNG27100	128.00	8	14659.56	148.00	-6.70	2.80	2.05	155.00	MODRSS		36.86		MODTES	CL		89.00		27M0F8W			P	
STP	STP24100	-13.00	8	14659.56	7.00	0.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		82.00		27M0F8W			P	
UGA	UGA05100	11.00	8	14659.56	32.30	1.20	1.46	1.12	60.00	MODRSS		42.31		MODTES	CL		82.00		27M0F8W			P	
AFS	AFS02100	5.00	9	14678.74	24.50	-28.00	3.13	1.68	27.00	MODRSS		37.24		MODTES	CR		82.00		27M0F8W			P	
IND	IND03801	56.00	9	14678.74	75.90	33.40	1.52	1.08	33.00	MODRSS		42.29		MODTES	CL		82.00		27M0F8W			P	1
IND	IND04401	68.00	9	14678.74	79.50	22.30	2.19	1.42	146.00	MODRSS		39.52		MODTES	CL		82.00		27M0F8W			P	1
ISR	ISR11000	-13.00	9	14678.74	34.90	31.40	0.94	0.60	117.00	MODRSS		46.93		MODTES	CL		82.00		27M0F8W			P	
MRC	MRC20900	-25.00	9	14678.74	-8.90	28.90	3.96	1.55	50.00	MODRSS		36.57		MODTES	CR		82.00		27M0F8W			P	
NMB	NMB02500	-19.00	9	14678.74	17.50	-21.60	2.66	1.90	48.00	MODRSS		37.41		MODTES	CR		82.00		27M0F8W			P	
YEM	YEM26700	11.00	9	14678.74	48.61	14.42	1.68	1.44	157.35	MODRSS		40.61		MODTES	CR		82.00		27M0F8W			P	4
ZMB	ZMB31400	-1.00	9	14678.74	27.50	-13.10	2.38	1.48	39.00	MODRSS		38.98		MODTES	CL		82.00		27M0F8W			P	
ETH	ETH09200	23.00	10	14697.92	40.35	9.19	2.66	2.23	166.11	MODRSS		36.72		MODTES	CR		82.00		27M0F8W			P	4
IND	IND04201	68.00	10	14697.92	79.30	27.70	2.14	1.16	147.00	MODRSS		40.50		MODTES	CR		82.00		27M0F8W			P	1
IND	IND04501	56.00	10	14697.92	76.20	19.50	1.58	1.58	21.00	MODRSS		40.47		MODTES	CR		82.00		27M0F8W			P	1
KOR	KO11201D	116.00	10	14697.92	127.50	36.00	1.24	1.02	168.00	R13RSS		43.40		R13TES	CL		82.00		27M0G7W	KOREASAT-1	20	AE	4
KOR	KOR11201	116.00	10	14697.92	127.50	36.00	1.24	1.02	168.00	R13RSS		43.40		R13TES	CL		82.00		27M0F8W	KOREASAT-1	20	AE	4
NIG	NIG11900	-19.00	10	14697.92	7.80	9.40	2.16	2.02	45.00	MODRSS		38.05		MODTES	CL		82.00		27M0F8W			P	
PNG	PNG13100	110.00	10	14697.92	147.70	-6.30	2.50	2.18	169.00	MODRSS		37.08		MODTES	CL		89.00		27M0F8W			P	
SNG	SNG15100	74.00	10	14697.92	103.80	1.30	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		82.00		27M0F8W			P	
TGO	TGO22600	-25.00	10	14697.92	0.80	8.60	1.52	0.60	105.00	MODRSS		44.85		MODTES	CR		82.00		27M0F8W			P	
UGA	UGA05100	11.00	10	14697.92	32.30	1.20	1.46	1.12	60.00	MODRSS		42.31		MODTES	CL		82.00		27M0F8W			P	
AFS	AFS02100	5.00	11	14717.10	24.50	-28.00	3.13	1.68	27.00	MODRSS		37.24		MODTES	CR		82.00		27M0F8W			P	
IND	IND04701	68.00	11	14717.10	93.30	11.10	1.92	0.60	96.00	MODRSS		43.83		MODTES	CL		82.00		27M0F8W			P	1
IRN	IRN10901	34.00	11	14717.10	54.20	32.40	3.82	1.82	149.00	MODRSS		36.03		MODTES	CR		82.00		27M0F8W			P	
ISR	ISR11000	-13.00	11	14717.10	34.90	31.40	0.94	0.60	117.00	MODRSS		46.93		MODTES	CL		82.00		27M0F8W			P	
MRC	MRC20900	-25.00	11	14717.10	-8.90	28.90	3.96	1.55	50.00	MODRSS		36.57		MODTES	CR		82.00		27M0F8W			P	
NMB	NMB0250A	-19.00	11	14717.10	17.50	-21.60	2.66	1.90	48.00	MODRSS		37.41		MODTES	CR		82.00		27M0F8W			P	4
SEN	SEN22201	-37.00	11	14717.10	-14.40	13.80	1.46	1.04	139.00	MODRSS		42.63		MODTES	CR		82.00		27M0F8W			P	
ZMB	ZMB31400	-1.00	11	14717.10	27.50	-13.10	2.38	1.48	39.00	MODRSS		38.98		MODTES	CL		82.00		27M0F8W			P	
CPV	CPV30100	-30.00	12	14736.28	-24.00	16.00	0.86	0.70	144.00	MODRSS		46.65		MODTES	CR		82.00		27M0F8W			P	4
ETH	ETH09200	23.00	12	14736.28	40.35	9.19	2.66	2.23	166.11	MODRSS		36.72		MODTES	CR		82.00		27M0F8W			P	4
IND	IND04001	56.00	12	14736.28	73.00	25.00	1.82	1.48	58.00	MODRSS		40.14		MODTES	CR		82.00		27M0F8W			P	1
KOR	KO11201D	116.00	12	14736.28	127.50	36.00	1.24	1.02	168.00	R13RSS		43.40		R13TES	CL		82.00		27M0G7W	KOREASAT-1	20	AE	4
KOR	KOR11201	116.00	12	14736.28	127.50	36.00	1.24	1.02	168.00	R13RSS		43.40		R13TES	CL		82.00		27M0F8W	KOREASAT-1	20	AE	4
MOZ	MOZ30700	-1.00	12	14736.28	34.00	-18.00	3.57	1.38	55.00	MODRSS		37.52		MODTES	CR		82.00		27M0F8W			P	
PAK	PAK21001	38.00	12	14736.28	72.10	30.80	1.16	0.72	90.00	MODRSS		45.23		MODTES	CL		82.00		27M0F8W			P	
PNG	PNG27100	128.00	12	14736.28	148.00	-6.70	2.80	2.05	155.00	MODRSS		36.86		MODTES	CL		89.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
STP	STP24100	-13.00	12	14736.28	7.00	0.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		82.00		27M0F8W			P	
IND	IND03901	56.00	13	14755.46	72.70	11.20	1.26	0.60	107.00	MODRSS		45.66		MODTES	CL		82.00		27M0F8W			P	1
NMB	NMB02500	-19.00	13	14755.46	17.50	-21.60	2.66	1.90	48.00	MODRSS		37.41		MODTES	CR		82.00		27M0F8W			P	
IND	IND03701	68.00	14	14774.64	93.00	25.50	1.46	1.13	40.00	MODRSS		42.27		MODTES	CR		82.00		27M0F8W			P	1
PNG	PNG13100	110.00	14	14774.64	147.70	-6.30	2.50	2.18	169.00	MODRSS		37.08		MODTES	CL		89.00		27M0F8W			P	
SNG	SNG15100	74.00	14	14774.64	103.80	1.30	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		82.00		27M0F8W			P	
TGO	TGO22600	-25.00	14	14774.64	0.80	8.60	1.52	0.60	105.00	MODRSS		44.85		MODTES	CR		82.00		27M0F8W			P	
AFG	AFG24600	50.00	1	17327.48	67.00	34.30	1.89	1.19	18.00	MODRSS		40.93		MODTES	CL		84.00		27M0F8W			P	
BLR	BLR06200	38.00	1	17327.48	28.04	53.18	1.17	0.60	9.68	MODRSS		45.96		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN15500	62.00	1	17327.48	101.90	33.50	5.10	2.80	143.00	MODRSS		32.90		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN16200	92.00	1	17327.48	108.10	33.70	5.00	4.00	148.00	MODRSS		31.44		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN16300	79.80	1	17327.48	116.00	39.20	1.20	0.80	132.00	MODRSS		44.62		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN19000	122.00	1	17327.48	114.17	23.32	0.91	0.60	2.88	MODRSS		47.08		MODTES	CL		84.00		27M0F8W			P	
CME	CME30000	-13.00	1	17327.48	12.70	6.20	2.54	1.68	87.00	MODRSS		38.15		MODTES	CL		84.00		27M0F8W			P	
E	E 12900	-30.00	1	17327.48	-3.10	39.90	2.10	1.14	154.00	MODRSS		40.66		MODTES	CR		84.00		27M0F8W		17	P	
E	HISPASA4	-30.00	1	17327.48	-3.10	39.90					ECO	43.00	18.70	R13TES	CR		82.50		27M0F8W	HISPASAT-1	17	AE	
E	HISPASA6	-30.00	1	17327.48	-3.10	39.90					ECO	43.00	18.70	R13TES	CR		83.50		27M0F8W	HISPASAT-1	17	AE	
EST	EST06100	23.00	1	17327.48	25.36	59.31	0.68	0.60	2.17	MODRSS		48.37		MODTES	CR		84.00		27M0F8W			P	
F	F 09300	-19.00	1	17327.48	2.60	45.90	2.50	0.98	160.00	R13RSS		40.56		R13TES	CL		84.00		27M0F8W		19	PE	
F /EUT	E2WA7DA1	29.00	1	17327.48	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	1	17327.48	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	1	17327.48	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	1	17327.48	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	1	17327.48	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	1	17327.48	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	1	17327.48	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
FJI	FJI19300	152.00	1	17327.48	179.40	-17.90	1.04	0.98	67.00	MODRSS		44.36		MODTES	CL		84.00		27M0F8W			P	
GUI	GUI19200	-37.00	1	17327.48	-11.00	10.20	1.58	1.04	147.00	MODRSS		42.29		MODTES	CR		85.00		27M0F8W			P	
HRV	HRV14800	34.00	1	17327.48	16.74	44.54	0.88	0.69	5.30	MODRSS		46.57		MODTES	CR		84.00		27M0F8W			P	
IND	IND03900	56.00	1	17327.48	72.70	11.20	1.26	0.60	107.00	MODRSS		45.66		MODTES	CL		84.00		27M0F8W			P	1
INS	INS03500	104.00	1	17327.48	115.20	-1.70	9.14	3.43	170.00	MODRSS		29.48		MODTES	CL		84.00		27M0F8W			P	
J	000BS-3N	109.85	1	17327.48	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	1	17327.48	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W		33	PE	
LBY	LBY28000	-25.00	1	17327.48	17.50	26.30	3.68	1.84	130.00	MODRSS		36.14		MODTES	CR		84.00		27M0F8W			P	
MDG	MDG23600	29.00	1	17327.48	46.20	-18.60	2.57	0.80	67.00	MODRSS		41.32		MODTES	CR		84.00		27M0F8W			P	
NZL	NZL05500	158.00	1	17327.48	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CL		84.00		27M0F8W			P	
POL	POL13200	-1.00	1	17327.48	17.20	51.80	2.00	2.00	0.00	MODRSS		38.43		MODTES	CR		87.00		27M0F8W			P	
QAT	QAT24700	17.00	1	17327.48	51.10	25.30	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
SLM	SLM00000	146.00	1	17327.48	159.32	-8.40	1.50	1.18	140.48	MODRSS		41.98		MODTES	CR		84.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
SMR	SMR31100	-37.00	1	17327.48	12.50	43.90	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		83.00		27M0F8W			P	
SWZ	SWZ31300	-1.00	1	17327.48	31.50	-26.50	0.62	0.60	66.00	MODRSS		48.74		MODTES	CL		82.00		27M0F8W			P	
THA	THA14200	74.00	1	17327.48	100.70	13.20	2.82	1.54	106.00	MODRSS		38.07		MODTES	CL		84.00		27M0F8W			P	
TJK	TJK06900	44.00	1	17327.48	71.14	38.37	1.25	0.76	159.15	MODRSS		44.65		MODTES	CR		84.00		27M0F8W			P	
TUR	TUR14500	5.00	1	17327.48	34.30	39.00	3.13	1.38	168.00	MODRSS		38.09		MODTES	CL		84.00		27M0F8W			P	
TZA	TZA22500	11.00	1	17327.48	34.60	-6.20	2.41	1.72	129.00	MODRSS		38.27		MODTES	CL		84.00		27M0F8W			P	
USA	PLM33700	170.00	1	17327.48	-166.30	-0.20	7.97	1.04	72.00	MODRSS		35.26		MODTES	CL		87.00		27M0F8W		9	P	
USA	PLM33701	170.00	1	17327.48	-124.80	39.10	4.43	0.73	132.00	MODRSS		39.35		MODTES	CL		87.00		27M0F8W		9	P	
USA	WAK33400	140.00	1	17327.48	152.50	11.70	7.89	3.52	0.00	MODRSS		30.01		MODTES	CR		87.00		27M0F8W		11	P	
USA	WAK33401	140.00	1	17327.48	-157.50	21.00	1.63	0.67	131.00	MODRSS		44.06		MODTES	CL		87.00		27M0F8W		11	P	
YUG	YUG14800	-7.00	1	17327.48	20.50	43.98	0.91	0.60	145.16	MODRSS		47.07		MODTES	CL		84.00		27M0F8W			P	
	YYY00001	11.00	1	17327.48	34.99	31.86	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	8
ALG	ALG25100	-25.00	2	17346.66	1.50	27.60	3.65	2.94	135.00	MODRSS		34.14		MODTES	CL		84.00		27M0F8W			P	
ARS	ARS27500	17.00	2	17346.66	44.60	23.40	4.21	2.48	145.00	MODRSS		34.26		MODTES	CR		84.00		27M0F8W			P	
AUS	AUS00800	164.00	2	17346.66	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CL		87.00		27M0F8W			P	
BIH	BIH14800	34.00	2	17346.66	17.77	44.32	0.62	0.60	166.84	MODRSS		48.71		MODTES	CL		84.00		27M0F8W			P	
BOT	BOT29700	-1.00	2	17346.66	23.30	-22.20	2.13	1.50	36.00	MODRSS		39.40		MODTES	CR		85.00		27M0F8W			P	
CHN	CHN15400	62.00	2	17346.66	101.90	33.50	5.10	2.80	143.00	MODRSS		32.90		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN16100	92.00	2	17346.66	108.10	33.70	5.00	4.00	148.00	MODRSS		31.44		MODTES	CL		84.00		27M0F8W			P	
CLN	CLN21900	50.00	2	17346.66	80.60	7.70	1.18	0.60	106.00	MODRSS		45.95		MODTES	CL		84.00		27M0F8W			P	
D	D 08700	-19.00	2	17346.66	9.60	49.90	1.62	0.72	147.00	MODRSS		43.78		MODTES	CR		84.00		27M0F8W			P	2
F	F2_A2722	-7.00	2	17346.66	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2722	-7.00	2	17346.66	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2728	-7.00	2	17346.66	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2722	-7.00	2	17346.66	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A2728	-7.00	2	17346.66	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3322	-7.00	2	17346.66	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_A3328	-7.00	2	17346.66	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2722	-7.00	2	17346.66	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D2728	-7.00	2	17346.66	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3322	-7.00	2	17346.66	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3328	-7.00	2	17346.66	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	NCL10000	140.00	2	17346.66	166.00	-21.00	1.14	0.72	146.00	MODRSS		45.30		MODTES	CL		84.00		27M0F8W		6	P	
F	NCL10001	140.00	2	17346.66	-177.10	-13.60	1.22	0.60	46.00	MODRSS		45.80		MODTES	CL		84.00		27M0F8W		6	P	
F	WAL10200	140.00	2	17346.66	-176.80	-14.00	0.74	0.60	29.00	MODRSS		47.97		MODTES	CL		84.00		27M0F8W		6	P	
F	WAL10201	140.00	2	17346.66	166.10	-21.30	1.31	0.82	133.00	MODRSS		44.16		MODTES	CL		84.00		27M0F8W		6	P	
F /EUT	E2WA7DA2	29.00	2	17346.66	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	2	17346.66	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	2	17346.66	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F /EUT	E2WA7DD2	29.00	2	17346.66	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	2	17346.66	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	2	17346.66	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	2	17346.66	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
FIN	FIN10300	5.00	2	17346.66	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W			P	
GNB	GNB30400	-30.00	2	17346.66	-15.00	12.00	0.90	0.60	172.00	MODRSS		47.12		MODTES	CR		84.00		27M0F8W			P	
IND	IND03700	68.00	2	17346.66	93.00	25.50	1.46	1.13	40.00	MODRSS		42.27		MODTES	CR		84.00		27M0F8W			P	1
INS	INS02800	80.20	2	17346.66	113.60	-1.40	6.73	3.33	160.00	MODRSS		30.94		MODTES	CR		84.00		27M0F8W			P	
IRL	IRL21100	-33.50	2	17346.66	-8.20	53.20	0.84	0.60	162.00	MODRSS		47.42		MODTES	CL		84.00		27M0F8W			P	5, 6
KOR	KOR11200	110.00	2	17346.66	127.50	36.00	1.24	1.02	168.00	MODRSS		43.43		MODTES	CL		89.00		27M0F8W			P	
LAO	LAO28400	74.00	2	17346.66	103.70	18.10	2.16	0.78	133.00	MODRSS		42.18		MODTES	CR		84.00		27M0F8W			P	
MAU	MAU24200	29.00	2	17346.66	59.80	-18.90	1.62	1.24	55.00	MODRSS		41.42		MODTES	CL		84.00		27M0F8W			P	
MHL	MHL00000	146.00	2	17346.66	167.64	9.83	2.07	0.90	157.42	MODRSS		41.75		MODTES	CL		84.00		27M0F8W			P	
MKD	MKD14800	23.00	2	17346.66	21.53	41.50	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
MLA	MLA22800	86.00	2	17346.66	114.10	3.90	2.34	1.12	45.00	MODRSS		40.26		MODTES	CL		84.00		27M0F8W			P	
MLI	MLI32700	-37.00	2	17346.66	-2.00	19.00	2.66	1.26	127.00	MODRSS		39.19		MODTES	CL		87.00		27M0F8W			P	
NOR	BIFROS22	-0.80	2	17346.66	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CL		84.00		27M0FXF	BIFROST-2		A	
NZL	CKH05200	158.00	2	17346.66	-161.00	-19.80	1.02	0.64	132.00	MODRSS		46.30		MODTES	CR		84.00		27M0F8W		3	P	
NZL	CKH05201	158.00	2	17346.66	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CR		84.00		27M0F8W		3	P	
PAK	PAK12700	38.00	2	17346.66	69.60	29.50	2.30	2.16	14.00	MODRSS		37.49		MODTES	CL		84.00		27M0F8W			P	
SOM	SOM31200	23.00	2	17346.66	45.00	6.40	3.26	1.54	71.00	MODRSS		37.44		MODTES	CL		84.00		27M0F8W			P	
TCD	TCD14300	-13.00	2	17346.66	18.10	15.50	3.40	1.72	107.00	MODRSS		36.78		MODTES	CR		84.00		27M0F8W			P	
TUV	TUV00000	176.00	2	17346.66	177.61	-7.11	0.94	0.60	137.58	MODRSS		46.93		MODTES	CR		84.00		27M0F8W			P	
YEM	YEM26600	11.00	2	17346.66	44.36	15.70	0.77	0.60	104.23	MODRSS		47.78		MODTES	CL		84.00		27M0F8W			P	
ZAI	ZAI32300	-19.00	2	17346.66	21.30	-6.80	2.80	1.52	149.00	MODRSS		38.16		MODTES	CL		84.00		27M0F8W			P	
AFG	AFG24500	50.00	3	17365.84	67.00	34.30	1.89	1.19	18.00	MODRSS		40.93		MODTES	CL		84.00		27M0F8W			P	
AUS	AUS00400	152.00	3	17365.84	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040A	152.00	3	17365.84	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040B	152.00	3	17365.84	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040C	152.00	3	17365.84	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS00700	164.00	3	17365.84	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CR		87.00		27M0F8W		77	P	
AUS	AUS0070A	164.00	3	17365.84	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		77	P	
BEN	BEN23300	-19.00	3	17365.84	2.20	9.50	1.44	0.68	97.00	MODRSS		44.54		MODTES	CR		84.00		27M0F8W			P	
BRU	BRU3300A	74.00	3	17365.84	114.70	4.40	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15700	62.00	3	17365.84	101.90	33.50	5.10	2.80	143.00	MODRSS		32.90		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN16000	92.00	3	17365.84	108.10	33.70	5.00	4.00	148.00	MODRSS		31.44		MODTES	CR		84.00		27M0F8W			P	
COM	COM20700	29.00	3	17365.84	44.10	-12.10	0.76	0.60	149.00	MODRSS		47.86		MODTES	CR		84.00		27M0F8W			P	
F	F2_A2733	-7.00	3	17365.84	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		84.00		27M0F9W	RADIOSAT-2	19	A	
F /EUT	E2WA7DA1	29.00	3	17365.84	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F /EUT	E2WA7DB1	29.00	3	17365.84	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	3	17365.84	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	3	17365.84	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	3	17365.84	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	3	17365.84	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	3	17365.84	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
FSM	FSM00000	146.00	3	17365.84	151.67	5.42	5.34	1.51	166.52	MODRSS		35.37		MODTES	CR		84.00		27M0F8W			P	
GAB	GAB26000	-13.00	3	17365.84	11.80	-0.60	1.43	1.12	64.00	MODRSS		42.40		MODTES	CL		84.00		27M0F8W			P	
GMB	GMB30200	-37.00	3	17365.84	-15.10	13.40	0.79	0.60	4.00	MODRSS		47.69		MODTES	CR		83.00		27M0F8W			P	
GRC	GRC10500	5.00	3	17365.84	24.50	38.00	2.03	1.29	159.00	MODRSS		40.27		MODTES	CL		84.00		27M0F8W			P	
IND	IND04300	56.00	3	17365.84	77.80	11.10	1.36	1.28	172.00	MODRSS		42.04		MODTES	CL		84.00		27M0F8W			P	1
INS	INS03600	104.00	3	17365.84	115.20	-1.70	9.14	3.43	170.00	MODRSS		29.48		MODTES	CL		84.00		27M0F8W			P	
IRN	IRN10900	34.00	3	17365.84	54.20	32.40	3.82	1.82	149.00	MODRSS		36.03		MODTES	CR		84.00		27M0F8W			P	
J	000BS-3N	109.85	3	17365.84	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	3	17365.84	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W		33	PE	
KIR	KIR00001	176.00	3	17365.84	177.16	-0.79	4.47	1.27	163.00	MODRSS		36.91		MODTES	CL		84.00		27M0F8W			P	
LBN	LBN27900	11.00	3	17365.84	35.90	33.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
LBR	LBR24400	-33.50	3	17365.84	-9.30	6.60	1.22	0.70	133.00	MODRSS		45.13		MODTES	CL		84.00		27M0F8W			P	5, 6
LBY	LBY32100	-25.00	3	17365.84	17.50	26.30	3.68	1.84	130.00	MODRSS		36.14		MODTES	CR		84.00		27M0F8W			P	
LIE	LIE25300	-37.00	3	17365.84	9.50	47.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
LTU	LTU06100	23.00	3	17365.84	24.02	55.46	0.72	0.60	173.90	MODRSS		48.11		MODTES	CR		84.00		27M0F8W			P	
LUX	LUX11400	-19.00	3	17365.84	6.00	49.80	0.68	0.68	0.00	MODRSS		47.80		MODTES	CL		84.00		27M0F8W			P	
NRU	NRU30900	134.00	3	17365.84	167.00	-0.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
POR	POR13300	-30.00	3	17365.84	-8.00	39.60	0.92	0.60	112.00	MODRSS		47.03		MODTES	CR		84.00		27M0F8W			P	
ROU	ROU13600	-1.00	3	17365.84	25.00	45.70	1.38	0.66	155.00	MODRSS		44.85		MODTES	CR		86.00		27M0F8W			P	
SMO	SMO05700	158.00	3	17365.84	-172.30	-13.70	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
SVK	SVK14400	17.00	3	17365.84	19.65	48.69	0.82	0.60	5.20	MODRSS		47.53		MODTES	CL		84.00		27M0F8W			P	
UKR	UKR06300	38.00	3	17365.84	31.82	48.19	2.32	0.95	177.32	MODRSS		41.01		MODTES	CR		84.00		27M0F8W			P	
USA	MRA33200	122.00	3	17365.84	151.10	11.60	6.48	3.49	179.00	MODRSS		30.90		MODTES	CL		87.00		27M0F8W		14	P	
USA	MRA33201	122.00	3	17365.84	-157.50	21.00	2.02	0.60	115.00	MODRSS		43.61		MODTES	CL		87.00		27M0F8W		14	P	
USA	SMA33500	170.00	3	17365.84	-166.30	-0.20	7.97	1.04	72.00	MODRSS		35.26		MODTES	CR		87.00		27M0F8W		13	P	
USA	SMA33501	170.00	3	17365.84	-124.80	39.20	4.43	0.73	132.00	MODRSS		39.35		MODTES	CR		87.00		27M0F8W		13	P	
UZB	UZB07100	44.00	3	17365.84	64.01	41.21	2.67	0.96	163.32	MODRSS		40.37		MODTES	CR		84.00		27M0F8W			P	
VTN	VTN32500	86.00	3	17365.84	108.00	14.80	3.80	1.90	126.00	MODRSS		35.86		MODTES	CR		84.00		27M0F8W			P	
VUT	VUT12800	140.00	3	17365.84	168.00	-16.40	1.52	0.68	87.00	MODRSS		44.30		MODTES	CR		84.00		27M0F8W			P	
ALG	ALG25200	-25.00	4	17385.02	1.50	27.60	3.65	2.94	135.00	MODRSS		34.14		MODTES	CL		84.00		27M0F8W			P	
AND	AND34100	-37.00	4	17385.02	1.60	42.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
ARS	ARS00300	17.00	4	17385.02	44.60	23.40	4.21	2.48	145.00	MODRSS		34.26		MODTES	CR		84.00		27M0F8W			P	
AUS	AUS00500	152.00	4	17385.02	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CR		87.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
AUT	AUT01600	-19.00	4	17385.02	12.20	47.50	1.14	0.63	166.00	MODRSS		45.88		MODTES	CR		84.00		27M0F8W			P	
AZE	AZE06400	23.00	4	17385.02	47.47	40.14	0.93	0.60	158.14	MODRSS		46.98		MODTES	CL		84.00		27M0F8W			P	
BUL	BUL02000	-1.00	4	17385.02	25.00	43.00	2.00	2.00	0.00	MODRSS		38.43		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15600	62.00	4	17385.02	101.90	33.50	5.10	2.80	143.00	MODRSS		32.90		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN16100	92.00	4	17385.02	108.10	33.70	5.00	4.00	148.00	MODRSS		31.44		MODTES	CL		84.00		27M0F8W			P	
EGY	EGY02600	-7.00	4	17385.02	29.70	26.80	2.33	1.72	136.00	MODRSS		38.42		MODTES	CR		86.00		27M0F8W			P	
F	F2_A2744	-7.00	4	17385.02	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F	OCE10100	-160.00	4	17385.02	-145.00	-16.30	4.34	3.54	4.00	MODRSS		32.58		MODTES	CR		84.00		27M0F8W			P	
F /EUT	E2WA7DA2	29.00	4	17385.02	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	4	17385.02	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	4	17385.02	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	4	17385.02	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	4	17385.02	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	4	17385.02	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	4	17385.02	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
G	G 02700	-33.50	4	17385.02	-3.50	53.80	1.84	0.72	142.00	MODRSS		43.23		MODTES	CL		84.00		27M0F8W			P	5, 6
IND	IND04800	68.00	4	17385.02	86.20	25.00	1.56	0.90	120.00	MODRSS		42.97		MODTES	CR		86.00		27M0F8W			P	1
INS	INS02800	80.20	4	17385.02	113.60	-1.40	6.73	3.33	160.00	MODRSS		30.94		MODTES	CR		84.00		27M0F8W			P	
KOR	KOR11200	110.00	4	17385.02	127.50	36.00	1.24	1.02	168.00	MODRSS		43.43		MODTES	CL		89.00		27M0F8W			P	
LAO	LAO28400	74.00	4	17385.02	103.70	18.10	2.16	0.78	133.00	MODRSS		42.18		MODTES	CR		84.00		27M0F8W			P	
MAU	MAU24300	29.00	4	17385.02	56.80	-13.90	1.56	1.38	65.00	MODRSS		41.12		MODTES	CL		84.00		27M0F8W			P	
MDA	MDA06300	38.00	4	17385.02	28.41	46.99	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
MLA	MLA22800	86.00	4	17385.02	114.10	3.90	2.34	1.12	45.00	MODRSS		40.26		MODTES	CL		84.00		27M0F8W			P	
MLD	MLD3060A	44.00	4	17385.02	73.10	6.00	0.96	0.60	90.00	MODRSS		46.84		MODTES	CR		84.00		27M0F8W			P	
MLI	MLI32800	-37.00	4	17385.02	-7.60	13.20	1.74	1.24	171.00	MODRSS		41.11		MODTES	CL		87.00		27M0F8W			P	
MLT	MLT14700	-13.00	4	17385.02	14.30	35.90	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
NZL	CKH05300	158.00	4	17385.02	-161.00	-19.80	1.00	0.60	132.00	MODRSS		46.67		MODTES	CR		84.00		27M0F8W		4	P	
NZL	CKH05301	158.00	4	17385.02	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CR		84.00		27M0F8W		4	P	
PAK	PAK28300	38.00	4	17385.02	74.70	33.90	1.34	1.13	160.00	MODRSS		42.65		MODTES	CL		84.00		27M0F8W			P	
PLW	PLW00000	146.00	4	17385.02	132.99	5.52	1.29	0.60	55.84	MODRSS		45.55		MODTES	CL		84.00		27M0F8W			P	
RRW	RRW31000	11.00	4	17385.02	30.00	-2.10	0.66	0.60	42.00	MODRSS		48.47		MODTES	CR		84.00		27M0F8W			P	
S	S 13800	5.00	4	17385.02	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W		27	P	
S	SIRIUS01	5.20	4	17385.02	14.00	63.00	1.30	0.70	142.00	R13RSS		43.00		R13TES	CL		84.00		27M0F8W	SIRIUS	27	AE	
SVN	SVN14800	34.00	4	17385.02	15.01	46.18	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
ZAI	ZAI32200	-19.00	4	17385.02	22.40	0.00	2.16	1.88	48.00	MODRSS		38.36		MODTES	CL		84.00		27M0F8W			P	
AFG	AFG24600	50.00	5	17404.20	67.00	34.30	1.89	1.19	18.00	MODRSS		40.93		MODTES	CL		84.00		27M0F8W			P	
BLR	BLR06200	38.00	5	17404.20	28.04	53.18	1.17	0.60	9.68	MODRSS		45.96		MODTES	CR		84.00		27M0F8W			P	
BTN	BTN03100	86.00	5	17404.20	90.44	27.05	0.72	0.60	175.47	MODRSS		48.11		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15500	62.00	5	17404.20	101.90	33.50	5.10	2.80	143.00	MODRSS		32.90		MODTES	CR		84.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
CHN	CHN16200	92.00	5	17404.20	108.10	33.70	5.00	4.00	148.00	MODRSS		31.44		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN16400	79.80	5	17404.20	112.20	37.40	1.06	0.76	111.00	MODRSS		45.39		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN19000	122.00	5	17404.20	114.17	23.32	0.91	0.60	2.88	MODRSS		47.08		MODTES	CL		84.00		27M0F8W			P	
CME	CME30000	-13.00	5	17404.20	12.70	6.20	2.54	1.68	87.00	MODRSS		38.15		MODTES	CL		84.00		27M0F8W			P	
E	E 12900	-30.00	5	17404.20	-3.10	39.90	2.10	1.14	154.00	MODRSS		40.66		MODTES	CR		84.00		27M0F8W		17	P	
E	HISPASA4	-30.00	5	17404.20	-3.10	39.90					ECO	43.00	18.70	R13TES	CR		82.50		27M0F8W	HISPASAT-1	17	AE	
E	HISPASA6	-30.00	5	17404.20	-3.10	39.90					ECO	43.00	18.70	R13TES	CR		83.50		27M0F8W	HISPASAT-1	17	AE	
EST	EST06100	23.00	5	17404.20	25.36	59.31	0.68	0.60	2.17	MODRSS		48.37		MODTES	CR		84.00		27M0F8W			P	
F	F 09300	-19.00	5	17404.20	2.60	45.90	2.50	0.98	160.00	R13RSS		40.56		R13TES	CL		84.00		27M0F8W		19	PE	
F /EUT	E2WA7DA1	29.00	5	17404.20	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	5	17404.20	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	5	17404.20	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	5	17404.20	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	5	17404.20	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	5	17404.20	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	5	17404.20	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
FJI	FJI19300	152.00	5	17404.20	179.40	-17.90	1.04	0.98	67.00	MODRSS		44.36		MODTES	CL		84.00		27M0F8W			P	
GUI	GUI19200	-37.00	5	17404.20	-11.00	10.20	1.58	1.04	147.00	MODRSS		42.29		MODTES	CR		85.00		27M0F8W			P	
HRV	HRV14800	34.00	5	17404.20	16.74	44.54	0.88	0.69	5.30	MODRSS		46.57		MODTES	CR		84.00		27M0F8W			P	
IND	IND04400	68.00	5	17404.20	79.50	22.30	2.19	1.42	146.00	MODRSS		39.52		MODTES	CL		84.00		27M0F8W			P	1
INS	INS03500	104.00	5	17404.20	115.20	-1.70	9.14	3.43	170.00	MODRSS		29.48		MODTES	CL		84.00		27M0F8W			P	
J	000BS-3N	109.85	5	17404.20	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	5	17404.20	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W		33	PE	
LBY	LBY28000	-25.00	5	17404.20	17.50	26.30	3.68	1.84	130.00	MODRSS		36.14		MODTES	CR		84.00		27M0F8W			P	
MDG	MDG23600	29.00	5	17404.20	46.20	-18.60	2.57	0.80	67.00	MODRSS		41.32		MODTES	CR		84.00		27M0F8W			P	
NZL	NZL05500	158.00	5	17404.20	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CL		84.00		27M0F8W			P	
POL	POL13200	-1.00	5	17404.20	17.20	51.80	2.00	2.00	0.00	MODRSS		38.43		MODTES	CR		87.00		27M0F8W			P	
QAT	QAT24700	17.00	5	17404.20	51.10	25.30	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
SLM	SLM00000	146.00	5	17404.20	159.32	-8.40	1.50	1.18	140.48	MODRSS		41.98		MODTES	CR		84.00		27M0F8W			P	
SMR	SMR31100	-37.00	5	17404.20	12.50	43.90	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		83.00		27M0F8W			P	
SWZ	SWZ31300	-1.00	5	17404.20	31.50	-26.50	0.62	0.60	66.00	MODRSS		48.74		MODTES	CL		82.00		27M0F8W			P	
THA	THA14200	74.00	5	17404.20	100.70	13.20	2.82	1.54	106.00	MODRSS		38.07		MODTES	CL		84.00		27M0F8W			P	
TJK	TJK06900	44.00	5	17404.20	71.14	38.37	1.25	0.76	159.15	MODRSS		44.65		MODTES	CR		84.00		27M0F8W			P	
TUR	TUR14500	5.00	5	17404.20	34.30	39.00	3.13	1.38	168.00	MODRSS		38.09		MODTES	CL		84.00		27M0F8W			P	
TZA	TZA22500	11.00	5	17404.20	34.60	-6.20	2.41	1.72	129.00	MODRSS		38.27		MODTES	CL		84.00		27M0F8W			P	
USA	PLM33700	170.00	5	17404.20	-166.30	-0.20	7.97	1.04	72.00	MODRSS		35.26		MODTES	CL		87.00		27M0F8W		9	P	
USA	PLM33701	170.00	5	17404.20	-124.80	39.10	4.43	0.73	132.00	MODRSS		39.35		MODTES	CL		87.00		27M0F8W		9	P	
USA	WAK33400	140.00	5	17404.20	152.50	11.70	7.89	3.52	0.00	MODRSS		30.01		MODTES	CR		87.00		27M0F8W		11	P	
USA	WAK33401	140.00	5	17404.20	-157.50	21.00	1.63	0.67	131.00	MODRSS		44.06		MODTES	CL		87.00		27M0F8W		11	P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
YUG	YUG14800	-7.00	5	17404.20	20.50	43.98	0.91	0.60	145.16	MODRSS		47.07		MODTES	CL		84.00		27M0F8W			P	
	YYY00001	11.00	5	17404.20	34.99	31.86	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	8
ALG	ALG25100	-25.00	6	17423.38	1.50	27.60	3.65	2.94	135.00	MODRSS		34.14		MODTES	CL		84.00		27M0F8W			P	
ARS	ARS27500	17.00	6	17423.38	44.60	23.40	4.21	2.48	145.00	MODRSS		34.26		MODTES	CR		84.00		27M0F8W			P	
AUS	AUS00800	164.00	6	17423.38	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CL		87.00		27M0F8W			P	
BIH	BIH14800	34.00	6	17423.38	17.77	44.32	0.62	0.60	166.84	MODRSS		48.71		MODTES	CL		84.00		27M0F8W			P	
BOT	BOT29700	-1.00	6	17423.38	23.30	-22.20	2.13	1.50	36.00	MODRSS		39.40		MODTES	CR		85.00		27M0F8W			P	
CHN	CHN15400	62.00	6	17423.38	101.90	33.50	5.10	2.80	143.00	MODRSS		32.90		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN16100	92.00	6	17423.38	108.10	33.70	5.00	4.00	148.00	MODRSS		31.44		MODTES	CL		84.00		27M0F8W			P	
CLN	CLN21900	50.00	6	17423.38	80.60	7.70	1.18	0.60	106.00	MODRSS		45.95		MODTES	CL		84.00		27M0F8W			P	
D	D 08700	-19.00	6	17423.38	9.60	49.90	1.62	0.72	147.00	MODRSS		43.78		MODTES	CR		84.00		27M0F8W			P	2
F	F2_A2722	-7.00	6	17423.38	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2722	-7.00	6	17423.38	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2728	-7.00	6	17423.38	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2722	-7.00	6	17423.38	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A2728	-7.00	6	17423.38	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3322	-7.00	6	17423.38	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_A3328	-7.00	6	17423.38	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2722	-7.00	6	17423.38	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D2728	-7.00	6	17423.38	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3322	-7.00	6	17423.38	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3328	-7.00	6	17423.38	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	NCL10000	140.00	6	17423.38	166.00	-21.00	1.14	0.72	146.00	MODRSS		45.30		MODTES	CL		84.00		27M0F8W		6	P	
F	NCL10001	140.00	6	17423.38	-177.10	-13.60	1.22	0.60	46.00	MODRSS		45.80		MODTES	CL		84.00		27M0F8W		6	P	
F	WAL10200	140.00	6	17423.38	-176.80	-14.00	0.74	0.60	29.00	MODRSS		47.97		MODTES	CL		84.00		27M0F8W		6	P	
F	WAL10201	140.00	6	17423.38	166.10	-21.30	1.31	0.82	133.00	MODRSS		44.16		MODTES	CL		84.00		27M0F8W		6	P	
F /EUT	E2WA7DA2	29.00	6	17423.38	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	6	17423.38	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	6	17423.38	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	6	17423.38	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	6	17423.38	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	6	17423.38	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	6	17423.38	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
FIN	FIN10300	5.00	6	17423.38	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W			P	
GNB	GNB30400	-30.00	6	17423.38	-15.00	12.00	0.90	0.60	172.00	MODRSS		47.12		MODTES	CR		84.00		27M0F8W			P	
IND	IND04500	56.00	6	17423.38	76.20	19.50	1.58	1.58	21.00	MODRSS		40.47		MODTES	CR		84.00		27M0F8W			P	1
INS	INS02800	80.20	6	17423.38	113.60	-1.40	6.73	3.33	160.00	MODRSS		30.94		MODTES	CR		84.00		27M0F8W			P	
IRL	IRL21100	-33.50	6	17423.38	-8.20	53.20	0.84	0.60	162.00	MODRSS		47.42		MODTES	CL		84.00		27M0F8W			P	5, 6
KOR	KOR11200	110.00	6	17423.38	127.50	36.00	1.24	1.02	168.00	MODRSS		43.43		MODTES	CL		89.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
LAO	LAO28400	74.00	6	17423.38	103.70	18.10	2.16	0.78	133.00	MODRSS		42.18		MODTES	CR		84.00		27M0F8W			P	
MAU	MAU24200	29.00	6	17423.38	59.80	-18.90	1.62	1.24	55.00	MODRSS		41.42		MODTES	CL		84.00		27M0F8W			P	
MHL	MHL00000	146.00	6	17423.38	167.64	9.83	2.07	0.90	157.42	MODRSS		41.75		MODTES	CL		84.00		27M0F8W			P	
MKD	MKD14800	23.00	6	17423.38	21.53	41.50	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
MLA	MLA22800	86.00	6	17423.38	114.10	3.90	2.34	1.12	45.00	MODRSS		40.26		MODTES	CL		84.00		27M0F8W			P	
MLI	MLI32700	-37.00	6	17423.38	-2.00	19.00	2.66	1.26	127.00	MODRSS		39.19		MODTES	CL		87.00		27M0F8W			P	
NOR	BIFROS22	-0.80	6	17423.38	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CL		84.00		27M0FXF	BIFROST-2		A	
NZL	CKH05200	158.00	6	17423.38	-161.00	-19.80	1.02	0.64	132.00	MODRSS		46.30		MODTES	CR		84.00		27M0F8W		3	P	
NZL	CKH05201	158.00	6	17423.38	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CR		84.00		27M0F8W		3	P	
PAK	PAK12700	38.00	6	17423.38	69.60	29.50	2.30	2.16	14.00	MODRSS		37.49		MODTES	CL		84.00		27M0F8W			P	
SOM	SOM31200	23.00	6	17423.38	45.00	6.40	3.26	1.54	71.00	MODRSS		37.44		MODTES	CL		84.00		27M0F8W			P	
TCD	TCD14300	-13.00	6	17423.38	18.10	15.50	3.40	1.72	107.00	MODRSS		36.78		MODTES	CR		84.00		27M0F8W			P	
TUV	TUV00000	176.00	6	17423.38	177.61	-7.11	0.94	0.60	137.58	MODRSS		46.93		MODTES	CR		84.00		27M0F8W			P	
YEM	YEM26600	11.00	6	17423.38	44.36	15.70	0.77	0.60	104.23	MODRSS		47.78		MODTES	CL		84.00		27M0F8W			P	
ZAI	ZAI32300	-19.00	6	17423.38	21.30	-6.80	2.80	1.52	149.00	MODRSS		38.16		MODTES	CL		84.00		27M0F8W			P	
AFG	AFG24500	50.00	7	17442.56	67.00	34.30	1.89	1.19	18.00	MODRSS		40.93		MODTES	CL		84.00		27M0F8W			P	
AUS	AUS00400	152.00	7	17442.56	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040A	152.00	7	17442.56	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040B	152.00	7	17442.56	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040C	152.00	7	17442.56	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS00700	164.00	7	17442.56	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CR		87.00		27M0F8W		77	P	
AUS	AUS0070A	164.00	7	17442.56	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		77	P	
BEN	BEN23300	-19.00	7	17442.56	2.20	9.50	1.44	0.68	97.00	MODRSS		44.54		MODTES	CR		84.00		27M0F8W			P	
BRU	BRU3300A	74.00	7	17442.56	114.70	4.40	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15700	62.00	7	17442.56	101.90	33.50	5.10	2.80	143.00	MODRSS		32.90		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN16000	92.00	7	17442.56	108.10	33.70	5.00	4.00	148.00	MODRSS		31.44		MODTES	CR		84.00		27M0F8W			P	
COM	COM20700	29.00	7	17442.56	44.10	-12.10	0.76	0.60	149.00	MODRSS		47.86		MODTES	CR		84.00		27M0F8W			P	
F	F2_A2733	-7.00	7	17442.56	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		84.00		27M0F9W	RADIOSAT-2	19	A	
F /EUT	E2WA7DA1	29.00	7	17442.56	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	7	17442.56	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	7	17442.56	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	7	17442.56	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	7	17442.56	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	7	17442.56	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	7	17442.56	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
FSM	FSM00000	146.00	7	17442.56	151.67	5.42	5.34	1.51	166.52	MODRSS		35.37		MODTES	CR		84.00		27M0F8W			P	
GAB	GAB26000	-13.00	7	17442.56	11.80	-0.60	1.43	1.12	64.00	MODRSS		42.40		MODTES	CL		84.00		27M0F8W			P	
GMB	GMB30200	-37.00	7	17442.56	-15.10	13.40	0.79	0.60	4.00	MODRSS		47.69		MODTES	CR		83.00		27M0F8W			P	
GRC	GRC10500	5.00	7	17442.56	24.50	38.00	2.03	1.29	159.00	MODRSS		40.27		MODTES	CL		84.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
IND	IND04700	68.00	7	17442.56	93.30	11.10	1.92	0.60	96.00	MODRSS		43.83		MODTES	CL		84.00		27M0F8W			P	1
INS	INS03600	104.00	7	17442.56	115.20	-1.70	9.14	3.43	170.00	MODRSS		29.48		MODTES	CL		84.00		27M0F8W			P	
IRN	IRN10900	34.00	7	17442.56	54.20	32.40	3.82	1.82	149.00	MODRSS		36.03		MODTES	CR		84.00		27M0F8W			P	
J	000BS-3N	109.85	7	17442.56	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	7	17442.56	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W		33	PE	
KIR	KIR00001	176.00	7	17442.56	177.16	-0.79	4.47	1.27	163.00	MODRSS		36.91		MODTES	CL		84.00		27M0F8W			P	
LBN	LBN27900	11.00	7	17442.56	35.90	33.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
LBR	LBR24400	-33.50	7	17442.56	-9.30	6.60	1.22	0.70	133.00	MODRSS		45.13		MODTES	CL		84.00		27M0F8W			P	5, 6
LBY	LBY32100	-25.00	7	17442.56	17.50	26.30	3.68	1.84	130.00	MODRSS		36.14		MODTES	CR		84.00		27M0F8W			P	
LIE	LIE25300	-37.00	7	17442.56	9.50	47.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
LTU	LTU06100	23.00	7	17442.56	24.02	55.46	0.72	0.60	173.90	MODRSS		48.11		MODTES	CR		84.00		27M0F8W			P	
LUX	LUX11400	-19.00	7	17442.56	6.00	49.80	0.68	0.68	0.00	MODRSS		47.80		MODTES	CL		84.00		27M0F8W			P	
NRU	NRU30900	134.00	7	17442.56	167.00	-0.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
POR	POR13300	-30.00	7	17442.56	-8.00	39.60	0.92	0.60	112.00	MODRSS		47.03		MODTES	CR		84.00		27M0F8W			P	
ROU	ROU13600	-1.00	7	17442.56	25.00	45.70	1.38	0.66	155.00	MODRSS		44.85		MODTES	CR		86.00		27M0F8W			P	
SMO	SMO05700	158.00	7	17442.56	-172.30	-13.70	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
SVK	SVK14400	17.00	7	17442.56	19.65	48.69	0.82	0.60	5.20	MODRSS		47.53		MODTES	CL		84.00		27M0F8W			P	
UKR	UKR06300	38.00	7	17442.56	31.82	48.19	2.32	0.95	177.32	MODRSS		41.01		MODTES	CR		84.00		27M0F8W			P	
USA	MRA33200	122.00	7	17442.56	151.10	11.60	6.48	3.49	179.00	MODRSS		30.90		MODTES	CL		87.00		27M0F8W		14	P	
USA	MRA33201	122.00	7	17442.56	-157.50	21.00	2.02	0.60	115.00	MODRSS		43.61		MODTES	CL		87.00		27M0F8W		14	P	
USA	SMA33500	170.00	7	17442.56	-166.30	-0.20	7.97	1.04	72.00	MODRSS		35.26		MODTES	CR		87.00		27M0F8W		13	P	
USA	SMA33501	170.00	7	17442.56	-124.80	39.20	4.43	0.73	132.00	MODRSS		39.35		MODTES	CR		87.00		27M0F8W		13	P	
UZB	UZB07100	44.00	7	17442.56	64.01	41.21	2.67	0.96	163.32	MODRSS		40.37		MODTES	CR		84.00		27M0F8W			P	
VTN	VTN32500	86.00	7	17442.56	108.00	14.80	3.80	1.90	126.00	MODRSS		35.86		MODTES	CR		84.00		27M0F8W			P	
VUT	VUT12800	140.00	7	17442.56	168.00	-16.40	1.52	0.68	87.00	MODRSS		44.30		MODTES	CR		84.00		27M0F8W			P	
ALG	ALG25200	-25.00	8	17461.74	1.50	27.60	3.65	2.94	135.00	MODRSS		34.14		MODTES	CL		84.00		27M0F8W			P	
AND	AND34100	-37.00	8	17461.74	1.60	42.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
ARS	ARS00300	17.00	8	17461.74	44.60	23.40	4.21	2.48	145.00	MODRSS		34.26		MODTES	CR		84.00		27M0F8W			P	
AUS	AUS00500	152.00	8	17461.74	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CR		87.00		27M0F8W			P	
AUT	AUT01600	-19.00	8	17461.74	12.20	47.50	1.14	0.63	166.00	MODRSS		45.88		MODTES	CR		84.00		27M0F8W			P	
AZE	AZE06400	23.00	8	17461.74	47.47	40.14	0.93	0.60	158.14	MODRSS		46.98		MODTES	CL		84.00		27M0F8W			P	
BUL	BUL02000	-1.00	8	17461.74	25.00	43.00	2.00	2.00	0.00	MODRSS		38.43		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15600	62.00	8	17461.74	101.90	33.50	5.10	2.80	143.00	MODRSS		32.90		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN17300	92.00	8	17461.74	115.70	27.40	1.14	0.94	99.00	MODRSS		44.15		MODTES	CL		84.00		27M0F8W			P	
EGY	EGY02600	-7.00	8	17461.74	29.70	26.80	2.33	1.72	136.00	MODRSS		38.42		MODTES	CR		86.00		27M0F8W			P	
F	F2_A2744	-7.00	8	17461.74	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F	OCE10100	-160.00	8	17461.74	-145.00	-16.30	4.34	3.54	4.00	MODRSS		32.58		MODTES	CR		84.00		27M0F8W			P	
F /EUT	E2WA7DA2	29.00	8	17461.74	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	8	17461.74	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F /EUT	E2WA7DC2	29.00	8	17461.74	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	8	17461.74	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	8	17461.74	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	8	17461.74	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	8	17461.74	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
G	G 02700	-33.50	8	17461.74	-3.50	53.80	1.84	0.72	142.00	MODRSS		43.23		MODTES	CL		84.00		27M0F8W			P	5, 6
IND	IND04000	56.00	8	17461.74	73.00	25.00	1.82	1.48	58.00	MODRSS		40.14		MODTES	CR		84.00		27M0F8W			P	1
INS	INS02800	80.20	8	17461.74	113.60	-1.40	6.73	3.33	160.00	MODRSS		30.94		MODTES	CR		84.00		27M0F8W			P	
KOR	KOR11200	110.00	8	17461.74	127.50	36.00	1.24	1.02	168.00	MODRSS		43.43		MODTES	CL		89.00		27M0F8W			P	
LAO	LAO28400	74.00	8	17461.74	103.70	18.10	2.16	0.78	133.00	MODRSS		42.18		MODTES	CR		84.00		27M0F8W			P	
MAU	MAU24300	29.00	8	17461.74	56.80	-13.90	1.56	1.38	65.00	MODRSS		41.12		MODTES	CL		84.00		27M0F8W			P	
MDA	MDA06300	38.00	8	17461.74	28.41	46.99	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
MLA	MLA22800	86.00	8	17461.74	114.10	3.90	2.34	1.12	45.00	MODRSS		40.26		MODTES	CL		84.00		27M0F8W			P	
MLD	MLD3060A	44.00	8	17461.74	73.10	6.00	0.96	0.60	90.00	MODRSS		46.84		MODTES	CR		84.00		27M0F8W			P	
MLI	MLI32800	-37.00	8	17461.74	-7.60	13.20	1.74	1.24	171.00	MODRSS		41.11		MODTES	CL		87.00		27M0F8W			P	
MLT	MLT14700	-13.00	8	17461.74	14.30	35.90	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
NZL	CKH05300	158.00	8	17461.74	-161.00	-19.80	1.00	0.60	132.00	MODRSS		46.67		MODTES	CR		84.00		27M0F8W		4	P	
NZL	CKH05301	158.00	8	17461.74	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CR		84.00		27M0F8W		4	P	
PAK	PAK28300	38.00	8	17461.74	74.70	33.90	1.34	1.13	160.00	MODRSS		42.65		MODTES	CL		84.00		27M0F8W			P	
PLW	PLW00000	146.00	8	17461.74	132.99	5.52	1.29	0.60	55.84	MODRSS		45.55		MODTES	CL		84.00		27M0F8W			P	
RRW	RRW31000	11.00	8	17461.74	30.00	-2.10	0.66	0.60	42.00	MODRSS		48.47		MODTES	CR		84.00		27M0F8W			P	
S	S 13800	5.00	8	17461.74	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W		27	P	
S	SIRIUS01	5.20	8	17461.74	14.00	63.00	1.30	0.70	142.00	R13RSS		43.00		R13TES	CL		84.00		27M0F8W	SIRIUS	27	AE	
SVN	SVN14800	34.00	8	17461.74	15.01	46.18	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
ZAI	ZAI32200	-19.00	8	17461.74	22.40	0.00	2.16	1.88	48.00	MODRSS		38.36		MODTES	CL		84.00		27M0F8W			P	
AFG	AFG24600	50.00	9	17480.92	67.00	34.30	1.89	1.19	18.00	MODRSS		40.93		MODTES	CL		84.00		27M0F8W			P	
BLR	BLR06200	38.00	9	17480.92	28.04	53.18	1.17	0.60	9.68	MODRSS		45.96		MODTES	CR		84.00		27M0F8W			P	
BTN	BTN03100	86.00	9	17480.92	90.44	27.05	0.72	0.60	175.47	MODRSS		48.11		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15500	62.00	9	17480.92	101.90	33.50	5.10	2.80	143.00	MODRSS		32.90		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN16200	92.00	9	17480.92	108.10	33.70	5.00	4.00	148.00	MODRSS		31.44		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN16500	79.80	9	17480.92	111.40	41.80	1.58	1.20	15.00	MODRSS		41.67		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN19000	122.00	9	17480.92	114.17	23.32	0.91	0.60	2.88	MODRSS		47.08		MODTES	CL		84.00		27M0F8W			P	
CME	CME30000	-13.00	9	17480.92	12.70	6.20	2.54	1.68	87.00	MODRSS		38.15		MODTES	CL		84.00		27M0F8W			P	
E	E 12900	-30.00	9	17480.92	-3.10	39.90	2.10	1.14	154.00	MODRSS		40.66		MODTES	CR		84.00		27M0F8W		17	P	
E	HISPASA4	-30.00	9	17480.92	-3.10	39.90					ECO	43.00	18.70	R13TES	CR		82.50		27M0F8W	HISPASAT-1	17	AE	
E	HISPASA6	-30.00	9	17480.92	-3.10	39.90					ECO	43.00	18.70	R13TES	CR		83.50		27M0F8W	HISPASAT-1	17	AE	
EST	EST06100	23.00	9	17480.92	25.36	59.31	0.68	0.60	2.17	MODRSS		48.37		MODTES	CR		84.00		27M0F8W			P	
F	F 09300	-19.00	9	17480.92	2.60	45.90	2.50	0.98	160.00	R13RSS		40.56		R13TES	CL		84.00		27M0F8W		19	PE	
F /EUT	E2WA7DA1	29.00	9	17480.92	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F /EUT	E2WA7DB1	29.00	9	17480.92	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	9	17480.92	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	9	17480.92	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	9	17480.92	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	9	17480.92	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	9	17480.92	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
FJI	FJI19300	152.00	9	17480.92	179.40	-17.90	1.04	0.98	67.00	MODRSS		44.36		MODTES	CL		84.00		27M0F8W			P	
GUI	GUI19200	-37.00	9	17480.92	-11.00	10.20	1.58	1.04	147.00	MODRSS		42.29		MODTES	CR		85.00		27M0F8W			P	
HRV	HRV14800	34.00	9	17480.92	16.74	44.54	0.88	0.69	5.30	MODRSS		46.57		MODTES	CR		84.00		27M0F8W			P	
IND	IND03900	56.00	9	17480.92	72.70	11.20	1.26	0.60	107.00	MODRSS		45.66		MODTES	CL		84.00		27M0F8W			P	1
INS	INS03500	104.00	9	17480.92	115.20	-1.70	9.14	3.43	170.00	MODRSS		29.48		MODTES	CL		84.00		27M0F8W			P	
J	000BS-3N	109.85	9	17480.92	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	9	17480.92	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W		33	PE	
LBY	LBY28000	-25.00	9	17480.92	17.50	26.30	3.68	1.84	130.00	MODRSS		36.14		MODTES	CR		84.00		27M0F8W			P	
MDG	MDG23600	29.00	9	17480.92	46.20	-18.60	2.57	0.80	67.00	MODRSS		41.32		MODTES	CR		84.00		27M0F8W			P	
NZL	NZL05500	158.00	9	17480.92	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CL		84.00		27M0F8W			P	
POL	POL13200	-1.00	9	17480.92	17.20	51.80	2.00	2.00	0.00	MODRSS		38.43		MODTES	CR		87.00		27M0F8W			P	
QAT	QAT24700	17.00	9	17480.92	51.10	25.30	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
SLM	SLM00000	146.00	9	17480.92	159.32	-8.40	1.50	1.18	140.48	MODRSS		41.98		MODTES	CR		84.00		27M0F8W			P	
SMR	SMR31100	-37.00	9	17480.92	12.50	43.90	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		83.00		27M0F8W			P	
SWZ	SWZ31300	-1.00	9	17480.92	31.50	-26.50	0.62	0.60	66.00	MODRSS		48.74		MODTES	CL		82.00		27M0F8W			P	
THA	THA14200	74.00	9	17480.92	100.70	13.20	2.82	1.54	106.00	MODRSS		38.07		MODTES	CL		84.00		27M0F8W			P	
TJK	TJK06900	44.00	9	17480.92	71.14	38.37	1.25	0.76	159.15	MODRSS		44.65		MODTES	CR		84.00		27M0F8W			P	
TUR	TUR14500	5.00	9	17480.92	34.30	39.00	3.13	1.38	168.00	MODRSS		38.09		MODTES	CL		84.00		27M0F8W			P	
TZA	TZA22500	11.00	9	17480.92	34.60	-6.20	2.41	1.72	129.00	MODRSS		38.27		MODTES	CL		84.00		27M0F8W			P	
USA	PLM33700	170.00	9	17480.92	-166.30	-0.20	7.97	1.04	72.00	MODRSS		35.26		MODTES	CL		87.00		27M0F8W		9	P	
USA	PLM33701	170.00	9	17480.92	-124.80	39.10	4.43	0.73	132.00	MODRSS		39.35		MODTES	CL		87.00		27M0F8W		9	P	
USA	WAK33400	140.00	9	17480.92	152.50	11.70	7.89	3.52	0.00	MODRSS		30.01		MODTES	CR		87.00		27M0F8W		11	P	
USA	WAK33401	140.00	9	17480.92	-157.50	21.00	1.63	0.67	131.00	MODRSS		44.06		MODTES	CL		87.00		27M0F8W		11	P	
YUG	YUG14800	-7.00	9	17480.92	20.50	43.98	0.91	0.60	145.16	MODRSS		47.07		MODTES	CL		84.00		27M0F8W			P	
	YYY00001	11.00	9	17480.92	34.99	31.86	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	8
ALG	ALG25100	-25.00	10	17500.10	1.50	27.60	3.65	2.94	135.00	MODRSS		34.14		MODTES	CL		84.00		27M0F8W			P	
ARS	ARS27500	17.00	10	17500.10	44.60	23.40	4.21	2.48	145.00	MODRSS		34.26		MODTES	CR		84.00		27M0F8W			P	
AUS	AUS00800	164.00	10	17500.10	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CL		87.00		27M0F8W			P	
BIH	BIH14800	34.00	10	17500.10	17.77	44.32	0.62	0.60	166.84	MODRSS		48.71		MODTES	CL		84.00		27M0F8W			P	
BOT	BOT29700	-1.00	10	17500.10	23.30	-22.20	2.13	1.50	36.00	MODRSS		39.40		MODTES	CR		85.00		27M0F8W			P	
CHN	CHN15400	62.00	10	17500.10	101.90	33.50	5.10	2.80	143.00	MODRSS		32.90		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN17100	92.00	10	17500.10	117.20	32.00	1.20	0.74	126.00	MODRSS		44.96		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN18700	79.80	10	17500.10	106.60	26.70	1.14	0.94	179.00	MODRSS		44.15		MODTES	CR		84.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
CLN	CLN21900	50.00	10	17500.10	80.60	7.70	1.18	0.60	106.00	MODRSS		45.95		MODTES	CL		84.00		27M0F8W			P	
D	D 08700	-19.00	10	17500.10	9.60	49.90	1.62	0.72	147.00	MODRSS		43.78		MODTES	CR		84.00		27M0F8W			P	2
F	F2_A2722	-7.00	10	17500.10	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2722	-7.00	10	17500.10	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2728	-7.00	10	17500.10	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2722	-7.00	10	17500.10	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A2728	-7.00	10	17500.10	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3322	-7.00	10	17500.10	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_A3328	-7.00	10	17500.10	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2722	-7.00	10	17500.10	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D2728	-7.00	10	17500.10	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3322	-7.00	10	17500.10	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3328	-7.00	10	17500.10	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	NCL10000	140.00	10	17500.10	166.00	-21.00	1.14	0.72	146.00	MODRSS		45.30		MODTES	CL		84.00		27M0F8W		6	P	
F	NCL10001	140.00	10	17500.10	-177.10	-13.60	1.22	0.60	46.00	MODRSS		45.80		MODTES	CL		84.00		27M0F8W		6	P	
F	WAL10200	140.00	10	17500.10	-176.80	-14.00	0.74	0.60	29.00	MODRSS		47.97		MODTES	CL		84.00		27M0F8W		6	P	
F	WAL10201	140.00	10	17500.10	166.10	-21.30	1.31	0.82	133.00	MODRSS		44.16		MODTES	CL		84.00		27M0F8W		6	P	
F /EUT	E2WA7DA2	29.00	10	17500.10	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	10	17500.10	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	10	17500.10	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	10	17500.10	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	10	17500.10	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	10	17500.10	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	10	17500.10	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
FIN	FIN10300	5.00	10	17500.10	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W			P	
GNB	GNB30400	-30.00	10	17500.10	-15.00	12.00	0.90	0.60	172.00	MODRSS		47.12		MODTES	CR		84.00		27M0F8W			P	
IND	IND03700	68.00	10	17500.10	93.00	25.50	1.46	1.13	40.00	MODRSS		42.27		MODTES	CR		84.00		27M0F8W			P	1
IRL	IRL21100	-33.50	10	17500.10	-8.20	53.20	0.84	0.60	162.00	MODRSS		47.42		MODTES	CL		84.00		27M0F8W			P	5, 6
KOR	KOR11200	110.00	10	17500.10	127.50	36.00	1.24	1.02	168.00	MODRSS		43.43		MODTES	CL		89.00		27M0F8W			P	
LAO	LAO28400	74.00	10	17500.10	103.70	18.10	2.16	0.78	133.00	MODRSS		42.18		MODTES	CR		84.00		27M0F8W			P	
MAU	MAU24200	29.00	10	17500.10	59.80	-18.90	1.62	1.24	55.00	MODRSS		41.42		MODTES	CL		84.00		27M0F8W			P	
MHL	MHL00000	146.00	10	17500.10	167.64	9.83	2.07	0.90	157.42	MODRSS		41.75		MODTES	CL		84.00		27M0F8W			P	
MKD	MKD14800	23.00	10	17500.10	21.53	41.50	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
MLA	MLA2280A	86.00	10	17500.10	114.10	3.90	2.34	1.12	45.00	MODRSS		40.26		MODTES	CL		84.00		27M0F8W			P	
MLI	MLI32700	-37.00	10	17500.10	-2.00	19.00	2.66	1.26	127.00	MODRSS		39.19		MODTES	CL		87.00		27M0F8W			P	
NOR	BIFROS22	-0.80	10	17500.10	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CL		84.00		27M0FXF	BIFROST-2		A	
NZL	CKH05200	158.00	10	17500.10	-161.00	-19.80	1.02	0.64	132.00	MODRSS		46.30		MODTES	CR		84.00		27M0F8W		3	P	
NZL	CKH05201	158.00	10	17500.10	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CR		84.00		27M0F8W		3	P	
PAK	PAK12700	38.00	10	17500.10	69.60	29.50	2.30	2.16	14.00	MODRSS		37.49		MODTES	CL		84.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
SOM	SOM31200	23.00	10	17500.10	45.00	6.40	3.26	1.54	71.00	MODRSS		37.44		MODTES	CL		84.00		27M0F8W			P	
TCD	TCD14300	-13.00	10	17500.10	18.10	15.50	3.40	1.72	107.00	MODRSS		36.78		MODTES	CR		84.00		27M0F8W			P	
TUV	TUV00000	176.00	10	17500.10	177.61	-7.11	0.94	0.60	137.58	MODRSS		46.93		MODTES	CR		84.00		27M0F8W			P	
YEM	YEM26600	11.00	10	17500.10	44.36	15.70	0.77	0.60	104.23	MODRSS		47.78		MODTES	CL		84.00		27M0F8W			P	
ZAI	ZAI32300	-19.00	10	17500.10	21.30	-6.80	2.80	1.52	149.00	MODRSS		38.16		MODTES	CL		84.00		27M0F8W			P	
AFG	AFG24500	50.00	11	17519.28	67.00	34.30	1.89	1.19	18.00	MODRSS		40.93		MODTES	CL		84.00		27M0F8W			P	
AUS	AUS00400	152.00	11	17519.28	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040A	152.00	11	17519.28	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040B	152.00	11	17519.28	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040C	152.00	11	17519.28	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS00700	164.00	11	17519.28	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CR		87.00		27M0F8W		77	P	
AUS	AUS0070A	164.00	11	17519.28	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		77	P	
BEN	BEN23300	-19.00	11	17519.28	2.20	9.50	1.44	0.68	97.00	MODRSS		44.54		MODTES	CR		84.00		27M0F8W			P	
BRU	BRU3300A	74.00	11	17519.28	114.70	4.40	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15700	62.00	11	17519.28	101.90	33.50	5.10	2.80	143.00	MODRSS		32.90		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN16000	92.00	11	17519.28	108.10	33.70	5.00	4.00	148.00	MODRSS		31.44		MODTES	CR		84.00		27M0F8W			P	
COM	COM20700	29.00	11	17519.28	44.10	-12.10	0.76	0.60	149.00	MODRSS		47.86		MODTES	CR		84.00		27M0F8W			P	
F	F2_A2733	-7.00	11	17519.28	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		84.00		27M0F9W	RADIOSAT-2	19	A	
F /EUT	E2WA7DA1	29.00	11	17519.28	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	11	17519.28	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	11	17519.28	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	11	17519.28	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	11	17519.28	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	11	17519.28	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	11	17519.28	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
FSM	FSM00000	146.00	11	17519.28	151.67	5.42	5.34	1.51	166.52	MODRSS		35.37		MODTES	CR		84.00		27M0F8W			P	
GAB	GAB26000	-13.00	11	17519.28	11.80	-0.60	1.43	1.12	64.00	MODRSS		42.40		MODTES	CL		84.00		27M0F8W			P	
GMB	GMB30200	-37.00	11	17519.28	-15.10	13.40	0.79	0.60	4.00	MODRSS		47.69		MODTES	CR		83.00		27M0F8W			P	
GRC	GRC10500	5.00	11	17519.28	24.50	38.00	2.03	1.29	159.00	MODRSS		40.27		MODTES	CL		84.00		27M0F8W			P	
IND	IND04300	56.00	11	17519.28	77.80	11.10	1.36	1.28	172.00	MODRSS		42.04		MODTES	CL		84.00		27M0F8W			P	1
INS	INS03600	104.00	11	17519.28	115.20	-1.70	9.14	3.43	170.00	MODRSS		29.48		MODTES	CL		84.00		27M0F8W			P	
IRN	IRN10900	34.00	11	17519.28	54.20	32.40	3.82	1.82	149.00	MODRSS		36.03		MODTES	CR		84.00		27M0F8W			P	
J	000BS-3N	109.85	11	17519.28	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	11	17519.28	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W		33	PE	
KIR	KIR00001	176.00	11	17519.28	177.16	-0.79	4.47	1.27	163.00	MODRSS		36.91		MODTES	CL		84.00		27M0F8W			P	
LBN	LBN27900	11.00	11	17519.28	35.90	33.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
LBR	LBR24400	-33.50	11	17519.28	-9.30	6.60	1.22	0.70	133.00	MODRSS		45.13		MODTES	CL		84.00		27M0F8W			P	5, 6
LBY	LBY32100	-25.00	11	17519.28	17.50	26.30	3.68	1.84	130.00	MODRSS		36.14		MODTES	CR		84.00		27M0F8W			P	
LIE	LIE25300	-37.00	11	17519.28	9.50	47.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
LTU	LTU06100	23.00	11	17519.28	24.02	55.46	0.72	0.60	173.90	MODRSS		48.11		MODTES	CR		84.00		27M0F8W			P	
LUX	LUX11400	-19.00	11	17519.28	6.00	49.80	0.68	0.68	0.00	MODRSS		47.80		MODTES	CL		84.00		27M0F8W			P	
NRU	NRU30900	134.00	11	17519.28	167.00	-0.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
POR	POR13300	-30.00	11	17519.28	-8.00	39.60	0.92	0.60	112.00	MODRSS		47.03		MODTES	CR		84.00		27M0F8W			P	
ROU	ROU13600	-1.00	11	17519.28	25.00	45.70	1.38	0.66	155.00	MODRSS		44.85		MODTES	CR		86.00		27M0F8W			P	
SMO	SMO05700	158.00	11	17519.28	-172.30	-13.70	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
SVK	SVK14400	17.00	11	17519.28	19.65	48.69	0.82	0.60	5.20	MODRSS		47.53		MODTES	CL		84.00		27M0F8W			P	
UKR	UKR06300	38.00	11	17519.28	31.82	48.19	2.32	0.95	177.32	MODRSS		41.01		MODTES	CR		84.00		27M0F8W			P	
USA	MRA33200	122.00	11	17519.28	151.10	11.60	6.48	3.49	179.00	MODRSS		30.90		MODTES	CL		87.00		27M0F8W		14	P	
USA	MRA33201	122.00	11	17519.28	-157.50	21.00	2.02	0.60	115.00	MODRSS		43.61		MODTES	CL		87.00		27M0F8W		14	P	
USA	SMA33500	170.00	11	17519.28	-166.30	-0.20	7.97	1.04	72.00	MODRSS		35.26		MODTES	CR		87.00		27M0F8W		13	P	
USA	SMA33501	170.00	11	17519.28	-124.80	39.20	4.43	0.73	132.00	MODRSS		39.35		MODTES	CR		87.00		27M0F8W		13	P	
UZB	UZB07100	44.00	11	17519.28	64.01	41.21	2.67	0.96	163.32	MODRSS		40.37		MODTES	CR		84.00		27M0F8W			P	
VTN	VTN32500	86.00	11	17519.28	108.00	14.80	3.80	1.90	126.00	MODRSS		35.86		MODTES	CR		84.00		27M0F8W			P	
VUT	VUT12800	140.00	11	17519.28	168.00	-16.40	1.52	0.68	87.00	MODRSS		44.30		MODTES	CR		84.00		27M0F8W			P	
ALG	ALG25200	-25.00	12	17538.46	1.50	27.60	3.65	2.94	135.00	MODRSS		34.14		MODTES	CL		84.00		27M0F8W			P	
AND	AND34100	-37.00	12	17538.46	1.60	42.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
ARS	ARS00300	17.00	12	17538.46	44.60	23.40	4.21	2.48	145.00	MODRSS		34.26		MODTES	CR		84.00		27M0F8W			P	
AUS	AUS00500	152.00	12	17538.46	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CR		87.00		27M0F8W			P	
AUT	AUT01600	-19.00	12	17538.46	12.20	47.50	1.14	0.63	166.00	MODRSS		45.88		MODTES	CR		84.00		27M0F8W			P	
AZE	AZE06400	23.00	12	17538.46	47.47	40.14	0.93	0.60	158.14	MODRSS		46.98		MODTES	CL		84.00		27M0F8W			P	
BGD	BGD22000	74.00	12	17538.46	90.30	23.60	1.46	0.84	135.00	MODRSS		43.56		MODTES	CR		84.00		27M0F8W			P	
BUL	BUL02000	-1.00	12	17538.46	25.00	43.00	2.00	2.00	0.00	MODRSS		38.43		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15600	62.00	12	17538.46	101.90	33.50	5.10	2.80	143.00	MODRSS		32.90		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN17000	92.00	12	17538.46	119.50	33.00	1.34	0.64	155.00	MODRSS		45.11		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN17800	79.80	12	17538.46	111.50	27.40	1.22	0.86	130.00	MODRSS		44.24		MODTES	CR		84.00		27M0F8W			P	
DNK	DNK08900	5.00	12	17538.46	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W		28	P	
EGY	EGY02600	-7.00	12	17538.46	29.70	26.80	2.33	1.72	136.00	MODRSS		38.42		MODTES	CR		86.00		27M0F8W			P	
F	F2_A2744	-7.00	12	17538.46	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F	OCE10100	-160.00	12	17538.46	-145.00	-16.30	4.34	3.54	4.00	MODRSS		32.58		MODTES	CR		84.00		27M0F8W			P	
F /EUT	E2WA7DA2	29.00	12	17538.46	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	12	17538.46	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	12	17538.46	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	12	17538.46	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	12	17538.46	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	12	17538.46	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	12	17538.46	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
G	G 02700	-33.50	12	17538.46	-3.50	53.80	1.84	0.72	142.00	MODRSS		43.23		MODTES	CL		84.00		27M0F8W			P	5, 6
IND	IND04800	68.00	12	17538.46	86.20	25.00	1.56	0.90	120.00	MODRSS		42.97		MODTES	CR		86.00		27M0F8W			P	1

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
KOR	KOR11200	110.00	12	17538.46	127.50	36.00	1.24	1.02	168.00	MODRSS		43.43		MODTES	CL		89.00		27M0F8W			P	
MAU	MAU24300	29.00	12	17538.46	56.80	-13.90	1.56	1.38	65.00	MODRSS		41.12		MODTES	CL		84.00		27M0F8W			P	
MDA	MDA06300	38.00	12	17538.46	28.41	46.99	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
MLD	MLD30600	44.00	12	17538.46	73.10	6.00	0.96	0.60	90.00	MODRSS		46.84		MODTES	CR		84.00		27M0F8W			P	
MLI	MLI32800	-37.00	12	17538.46	-7.60	13.20	1.74	1.24	171.00	MODRSS		41.11		MODTES	CL		87.00		27M0F8W			P	
MLT	MLT14700	-13.00	12	17538.46	14.30	35.90	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
NZL	CKH05300	158.00	12	17538.46	-161.00	-19.80	1.00	0.60	132.00	MODRSS		46.67		MODTES	CR		84.00		27M0F8W		4	P	
NZL	CKH05301	158.00	12	17538.46	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CR		84.00		27M0F8W		4	P	
PAK	PAK21000	38.00	12	17538.46	72.10	30.80	1.16	0.72	90.00	MODRSS		45.23		MODTES	CL		84.00		27M0F8W			P	
PLW	PLW00000	146.00	12	17538.46	132.99	5.52	1.29	0.60	55.84	MODRSS		45.55		MODTES	CL		84.00		27M0F8W			P	
RRW	RRW31000	11.00	12	17538.46	30.00	-2.10	0.66	0.60	42.00	MODRSS		48.47		MODTES	CR		84.00		27M0F8W			P	
S	SIRIUS02	5.20	12	17538.46	14.00	63.00	1.30	0.70	142.00	R13RSS		43.00		R13TES	CL		84.00		27M0F8W	SIRIUS	28	AE	
SVN	SVN14800	34.00	12	17538.46	15.01	46.18	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
ZAI	ZAI32200	-19.00	12	17538.46	22.40	0.00	2.16	1.88	48.00	MODRSS		38.36		MODTES	CL		84.00		27M0F8W			P	
AFG	AFG24600	50.00	13	17557.64	67.00	34.30	1.89	1.19	18.00	MODRSS		40.93		MODTES	CL		84.00		27M0F8W			P	
BLR	BLR06200	38.00	13	17557.64	28.04	53.18	1.17	0.60	9.68	MODRSS		45.96		MODTES	CR		84.00		27M0F8W			P	
BTN	BTN03100	86.00	13	17557.64	90.44	27.05	0.72	0.60	175.47	MODRSS		48.11		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15501	62.00	13	17557.64	88.30	31.50	3.38	1.45	162.00	MODRSS		37.54		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN18000	92.00	13	17557.64	113.10	23.10	4.70	3.50	96.00	MODRSS		32.29		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN19000	122.00	13	17557.64	114.17	23.32	0.91	0.60	2.88	MODRSS		47.08		MODTES	CL		84.00		27M0F8W			P	
CME	CME30000	-13.00	13	17557.64	12.70	6.20	2.54	1.68	87.00	MODRSS		38.15		MODTES	CL		84.00		27M0F8W			P	
E	E 12900	-30.00	13	17557.64	-3.10	39.90	2.10	1.14	154.00	MODRSS		40.66		MODTES	CR		84.00		27M0F8W		17	P	
E	HISPASA4	-30.00	13	17557.64	-3.10	39.90					ECO	43.00	18.70	R13TES	CR		82.50		27M0F8W	HISPASAT-1	17	AE	
E	HISPASA6	-30.00	13	17557.64	-3.10	39.90					ECO	43.00	18.70	R13TES	CR		83.50		27M0F8W	HISPASAT-1	17	AE	
EST	EST06100	23.00	13	17557.64	25.36	59.31	0.68	0.60	2.17	MODRSS		48.37		MODTES	CR		84.00		27M0F8W			P	
F	F 09300	-19.00	13	17557.64	2.60	45.90	2.50	0.98	160.00	R13RSS		40.56		R13TES	CL		84.00		27M0F8W		19	PE	
F /EUT	E2WA7DA1	29.00	13	17557.64	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	13	17557.64	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	13	17557.64	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	13	17557.64	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	13	17557.64	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	13	17557.64	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	13	17557.64	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
FJI	FJI1930A	152.00	13	17557.64	179.40	-17.90	1.04	0.98	67.00	MODRSS		44.36		MODTES	CL		84.00		27M0F8W			P	
GUI	GUI19200	-37.00	13	17557.64	-11.00	10.20	1.58	1.04	147.00	MODRSS		42.29		MODTES	CR		85.00		27M0F8W			P	
HRV	HRV14800	34.00	13	17557.64	16.74	44.54	0.88	0.69	5.30	MODRSS		46.57		MODTES	CR		84.00		27M0F8W			P	
IND	IND04400	68.00	13	17557.64	79.50	22.30	2.19	1.42	146.00	MODRSS		39.52		MODTES	CL		84.00		27M0F8W			P	1
INS	INS03500	104.00	13	17557.64	115.20	-1.70	9.14	3.43	170.00	MODRSS		29.48		MODTES	CL		84.00		27M0F8W			P	
J	000BS-3N	109.85	13	17557.64	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W	BS-3N	33	AE	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
J	J 11100	110.00	13	17557.64	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W		33	PE	
LBY	LBY28000	-25.00	13	17557.64	17.50	26.30	3.68	1.84	130.00	MODRSS		36.14		MODTES	CR		84.00		27M0F8W			P	
MDG	MDG23600	29.00	13	17557.64	46.20	-18.60	2.57	0.80	67.00	MODRSS		41.32		MODTES	CR		84.00		27M0F8W			P	
NZL	NZL05500	158.00	13	17557.64	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CL		84.00		27M0F8W			P	
NZL	NZL28700	128.00	13	17557.64	173.00	-41.00	3.30	1.28	48.00	MODRSS		38.19		MODTES	CL		84.00		27M0F8W			P	
POL	POL13200	-1.00	13	17557.64	17.20	51.80	2.00	2.00	0.00	MODRSS		38.43		MODTES	CR		87.00		27M0F8W			P	
QAT	QAT24700	17.00	13	17557.64	51.10	25.30	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
SLM	SLM00000	146.00	13	17557.64	159.32	-8.40	1.50	1.18	140.48	MODRSS		41.98		MODTES	CR		84.00		27M0F8W			P	
SMR	SMR31100	-37.00	13	17557.64	12.50	43.90	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		83.00		27M0F8W			P	
SWZ	SWZ31300	-1.00	13	17557.64	31.50	-26.50	0.62	0.60	66.00	MODRSS		48.74		MODTES	CL		82.00		27M0F8W			P	
THA	THA14200	74.00	13	17557.64	100.70	13.20	2.82	1.54	106.00	MODRSS		38.07		MODTES	CL		84.00		27M0F8W			P	
TJK	TJK06900	44.00	13	17557.64	71.14	38.37	1.25	0.76	159.15	MODRSS		44.65		MODTES	CR		84.00		27M0F8W			P	
TUR	TUR14500	5.00	13	17557.64	34.30	39.00	3.13	1.38	168.00	MODRSS		38.09		MODTES	CL		84.00		27M0F8W			P	
TZA	TZA22500	11.00	13	17557.64	34.60	-6.20	2.41	1.72	129.00	MODRSS		38.27		MODTES	CL		84.00		27M0F8W			P	
USA	PLM33700	170.00	13	17557.64	-166.30	-0.20	7.97	1.04	72.00	MODRSS		35.26		MODTES	CL		87.00		27M0F8W		9	P	
USA	PLM33701	170.00	13	17557.64	-124.80	39.10	4.43	0.73	132.00	MODRSS		39.35		MODTES	CL		87.00		27M0F8W		9	P	
USA	WAK33400	140.00	13	17557.64	152.50	11.70	7.89	3.52	0.00	MODRSS		30.01		MODTES	CR		87.00		27M0F8W		11	P	
USA	WAK33401	140.00	13	17557.64	-157.50	21.00	1.63	0.67	131.00	MODRSS		44.06		MODTES	CL		87.00		27M0F8W		11	P	
YUG	YUG14800	-7.00	13	17557.64	20.50	43.98	0.91	0.60	145.16	MODRSS		47.07		MODTES	CL		84.00		27M0F8W			P	
	YYY00001	11.00	13	17557.64	34.99	31.86	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	8
ALG	ALG25100	-25.00	14	17576.82	1.50	27.60	3.65	2.94	135.00	MODRSS		34.14		MODTES	CL		84.00		27M0F8W			P	
ARS	ARS27500	17.00	14	17576.82	44.60	23.40	4.21	2.48	145.00	MODRSS		34.26		MODTES	CR		84.00		27M0F8W			P	
AUS	AUS00800	164.00	14	17576.82	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CL		87.00		27M0F8W			P	
BGD	BGD22000	74.00	14	17576.82	90.30	23.60	1.46	0.84	135.00	MODRSS		43.56		MODTES	CR		84.00		27M0F8W			P	
BIH	BIH14800	34.00	14	17576.82	17.77	44.32	0.62	0.60	166.84	MODRSS		48.71		MODTES	CL		84.00		27M0F8W			P	
BOT	BOT29700	-1.00	14	17576.82	23.30	-22.20	2.13	1.50	36.00	MODRSS		39.40		MODTES	CR		85.00		27M0F8W			P	
CHN	CHN15401	62.00	14	17576.82	83.90	40.50	2.75	2.05	177.00	MODRSS		36.94		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN17200	92.00	14	17576.82	120.40	29.10	0.96	0.84	123.00	MODRSS		45.38		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN18100	79.80	14	17576.82	108.50	23.80	1.41	1.08	153.00	MODRSS		42.62		MODTES	CR		84.00		27M0F8W			P	
CLN	CLN21900	50.00	14	17576.82	80.60	7.70	1.18	0.60	106.00	MODRSS		45.95		MODTES	CL		84.00		27M0F8W			P	
D	D 08700	-19.00	14	17576.82	9.60	49.90	1.62	0.72	147.00	MODRSS		43.78		MODTES	CR		84.00		27M0F8W			P	2
F	F2_A2722	-7.00	14	17576.82	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2722	-7.00	14	17576.82	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2728	-7.00	14	17576.82	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2722	-7.00	14	17576.82	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A2728	-7.00	14	17576.82	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3322	-7.00	14	17576.82	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_A3328	-7.00	14	17576.82	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2722	-7.00	14	17576.82	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F	F3_D2728	-7.00	14	17576.82	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3322	-7.00	14	17576.82	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3328	-7.00	14	17576.82	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	NCL10000	140.00	14	17576.82	166.00	-21.00	1.14	0.72	146.00	MODRSS		45.30		MODTES	CL		84.00		27M0F8W		6	P	
F	NCL10001	140.00	14	17576.82	-177.10	-13.60	1.22	0.60	46.00	MODRSS		45.80		MODTES	CL		84.00		27M0F8W		6	P	
F	WAL10200	140.00	14	17576.82	-176.80	-14.00	0.74	0.60	29.00	MODRSS		47.97		MODTES	CL		84.00		27M0F8W		6	P	
F	WAL10201	140.00	14	17576.82	166.10	-21.30	1.31	0.82	133.00	MODRSS		44.16		MODTES	CL		84.00		27M0F8W		6	P	
F /EUT	E2WA7DA2	29.00	14	17576.82	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	14	17576.82	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	14	17576.82	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	14	17576.82	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	14	17576.82	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	14	17576.82	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	14	17576.82	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
GNB	GNB30400	-30.00	14	17576.82	-15.00	12.00	0.90	0.60	172.00	MODRSS		47.12		MODTES	CR		84.00		27M0F8W			P	
IND	IND04500	56.00	14	17576.82	76.20	19.50	1.58	1.58	21.00	MODRSS		40.47		MODTES	CR		84.00		27M0F8W			P	1
IRL	IRL21100	-33.50	14	17576.82	-8.20	53.20	0.84	0.60	162.00	MODRSS		47.42		MODTES	CL		84.00		27M0F8W			P	
KRE	KRE28600	110.00	14	17576.82	127.00	39.10	1.30	1.10	31.00	MODRSS		42.89		MODTES	CL		87.00		27M0F8W			P	
MAU	MAU24200	29.00	14	17576.82	59.80	-18.90	1.62	1.24	55.00	MODRSS		41.42		MODTES	CL		84.00		27M0F8W			P	
MHL	MHL00000	146.00	14	17576.82	167.64	9.83	2.07	0.90	157.42	MODRSS		41.75		MODTES	CL		84.00		27M0F8W			P	
MKD	MKD14800	23.00	14	17576.82	21.53	41.50	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
MLI	MLI32700	-37.00	14	17576.82	-2.00	19.00	2.66	1.26	127.00	MODRSS		39.19		MODTES	CL		87.00		27M0F8W			P	
NOR	BIFROS22	-0.80	14	17576.82	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CL		84.00		27M0FXF	BIFROST-2		A	
NOR	NOR12000	5.00	14	17576.82	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W			P	
NZL	CKH05200	158.00	14	17576.82	-161.00	-19.80	1.02	0.64	132.00	MODRSS		46.30		MODTES	CR		84.00		27M0F8W		3	P	
NZL	CKH05201	158.00	14	17576.82	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CR		84.00		27M0F8W		3	P	
PAK	PAK21000	38.00	14	17576.82	72.10	30.80	1.16	0.72	90.00	MODRSS		45.23		MODTES	CL		84.00		27M0F8W			P	
SOM	SOM31200	23.00	14	17576.82	45.00	6.40	3.26	1.54	71.00	MODRSS		37.44		MODTES	CL		84.00		27M0F8W			P	
TCD	TCD14300	-13.00	14	17576.82	18.10	15.50	3.40	1.72	107.00	MODRSS		36.78		MODTES	CR		84.00		27M0F8W			P	
TUV	TUV00000	176.00	14	17576.82	177.61	-7.11	0.94	0.60	137.58	MODRSS		46.93		MODTES	CR		84.00		27M0F8W			P	
YEM	YEM26600	11.00	14	17576.82	44.36	15.70	0.77	0.60	104.23	MODRSS		47.78		MODTES	CL		84.00		27M0F8W			P	
ZAI	ZAI32300	-19.00	14	17576.82	21.30	-6.80	2.80	1.52	149.00	MODRSS		38.16		MODTES	CL		84.00		27M0F8W			P	
AFG	AFG24500	50.00	15	17596.00	67.00	34.30	1.89	1.19	18.00	MODRSS		40.93		MODTES	CL		84.00		27M0F8W			P	
AUS	AUS00400	152.00	15	17596.00	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040A	152.00	15	17596.00	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040B	152.00	15	17596.00	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040C	152.00	15	17596.00	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS00700	164.00	15	17596.00	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CR		87.00		27M0F8W		77	P	
AUS	AUS0070A	164.00	15	17596.00	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		77	P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
BEN	BEN23300	-19.00	15	17596.00	2.20	9.50	1.44	0.68	97.00	MODRSS		44.54		MODTES	CR		84.00		27M0F8W			P	
BRU	BRU3300A	74.00	15	17596.00	114.70	4.40	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15800	79.80	15	17596.00	106.00	32.50	5.00	3.70	150.00	MODRSS		31.78		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN17400	92.00	15	17596.00	118.10	25.90	1.02	0.84	82.00	MODRSS		45.12		MODTES	CR		84.00		27M0F8W			P	
COM	COM20700	29.00	15	17596.00	44.10	-12.10	0.76	0.60	149.00	MODRSS		47.86		MODTES	CR		84.00		27M0F8W			P	
F	F2_A2733	-7.00	15	17596.00	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		84.00		27M0F9W	RADIOSAT-2	19	A	
F /EUT	E2WA7DA1	29.00	15	17596.00	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	15	17596.00	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	15	17596.00	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	15	17596.00	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	15	17596.00	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	15	17596.00	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	15	17596.00	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
FSM	FSM00000	146.00	15	17596.00	151.67	5.42	5.34	1.51	166.52	MODRSS		35.37		MODTES	CR		84.00		27M0F8W			P	
GAB	GAB26000	-13.00	15	17596.00	11.80	-0.60	1.43	1.12	64.00	MODRSS		42.40		MODTES	CL		84.00		27M0F8W			P	
GMB	GMB30200	-37.00	15	17596.00	-15.10	13.40	0.79	0.60	4.00	MODRSS		47.69		MODTES	CR		83.00		27M0F8W			P	
GRC	GRC10500	5.00	15	17596.00	24.50	38.00	2.03	1.29	159.00	MODRSS		40.27		MODTES	CL		84.00		27M0F8W			P	
IND	IND04700	68.00	15	17596.00	93.30	11.10	1.92	0.60	96.00	MODRSS		43.83		MODTES	CL		84.00		27M0F8W			P	1
INS	INS03600	104.00	15	17596.00	115.20	-1.70	9.14	3.43	170.00	MODRSS		29.48		MODTES	CL		84.00		27M0F8W			P	
IRN	IRN10900	34.00	15	17596.00	54.20	32.40	3.82	1.82	149.00	MODRSS		36.03		MODTES	CR		84.00		27M0F8W			P	
J	000BS-3N	109.85	15	17596.00	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W	BS-3N	33	AE	
J	J 11100	110.00	15	17596.00	134.50	31.50	3.52	3.30	68.00	R13RSS		33.80		R13TES	CR		87.00		27M0F8W		33	PE	
KIR	KIR00002	176.00	15	17596.00	-157.78	-0.33	2.40	0.64	110.62	MODRSS		42.60		MODTES	CL		84.00		27M0F8W			P	
LBN	LBN27900	11.00	15	17596.00	35.90	33.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
LBR	LBR24400	-33.50	15	17596.00	-9.30	6.60	1.22	0.70	133.00	MODRSS		45.13		MODTES	CL		84.00		27M0F8W			P	
LBY	LBY32100	-25.00	15	17596.00	17.50	26.30	3.68	1.84	130.00	MODRSS		36.14		MODTES	CR		84.00		27M0F8W			P	
LIE	LIE25300	-37.00	15	17596.00	9.50	47.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
LTU	LTU06100	23.00	15	17596.00	24.02	55.46	0.72	0.60	173.90	MODRSS		48.11		MODTES	CR		84.00		27M0F8W			P	
LUX	LUX11400	-19.00	15	17596.00	6.00	49.80	0.68	0.68	0.00	MODRSS		47.80		MODTES	CL		84.00		27M0F8W			P	
NRU	NRU30900	134.00	15	17596.00	167.00	-0.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
POR	POR13300	-30.00	15	17596.00	-8.00	39.60	0.92	0.60	112.00	MODRSS		47.03		MODTES	CR		84.00		27M0F8W			P	
ROU	ROU13600	-1.00	15	17596.00	25.00	45.70	1.38	0.66	155.00	MODRSS		44.85		MODTES	CR		86.00		27M0F8W			P	
SMO	SMO05700	158.00	15	17596.00	-172.30	-13.70	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
SVK	SVK14400	17.00	15	17596.00	19.65	48.69	0.82	0.60	5.20	MODRSS		47.53		MODTES	CL		84.00		27M0F8W			P	
UKR	UKR06300	38.00	15	17596.00	31.82	48.19	2.32	0.95	177.32	MODRSS		41.01		MODTES	CR		84.00		27M0F8W			P	
USA	MRA33200	122.00	15	17596.00	151.10	11.60	6.48	3.49	179.00	MODRSS		30.90		MODTES	CL		87.00		27M0F8W		14	P	
USA	MRA33201	122.00	15	17596.00	-157.50	21.00	2.02	0.60	115.00	MODRSS		43.61		MODTES	CL		87.00		27M0F8W		14	P	
USA	SMA33500	170.00	15	17596.00	-166.30	-0.20	7.97	1.04	72.00	MODRSS		35.26		MODTES	CR		87.00		27M0F8W		13	P	
USA	SMA33501	170.00	15	17596.00	-124.80	39.20	4.43	0.73	132.00	MODRSS		39.35		MODTES	CR		87.00		27M0F8W		13	P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
UZB	UZB07100	44.00	15	17596.00	64.01	41.21	2.67	0.96	163.32	MODRSS		40.37		MODTES	CR		84.00		27M0F8W			P	
VTN	VTN32500	86.00	15	17596.00	108.00	14.80	3.80	1.90	126.00	MODRSS		35.86		MODTES	CR		84.00		27M0F8W			P	
VUT	VUT12800	140.00	15	17596.00	168.00	-16.40	1.52	0.68	87.00	MODRSS		44.30		MODTES	CR		84.00		27M0F8W			P	
ALG	ALG25200	-25.00	16	17615.18	1.50	27.60	3.65	2.94	135.00	MODRSS		34.14		MODTES	CL		84.00		27M0F8W			P	
AND	AND34100	-37.00	16	17615.18	1.60	42.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
ARS	ARS00300	17.00	16	17615.18	44.60	23.40	4.21	2.48	145.00	MODRSS		34.26		MODTES	CR		84.00		27M0F8W			P	
AUS	AUS00500	152.00	16	17615.18	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CR		87.00		27M0F8W			P	
AUT	AUT01600	-19.00	16	17615.18	12.20	47.50	1.14	0.63	166.00	MODRSS		45.88		MODTES	CR		84.00		27M0F8W			P	
AZE	AZE06400	23.00	16	17615.18	47.47	40.14	0.93	0.60	158.14	MODRSS		46.98		MODTES	CL		84.00		27M0F8W			P	
BUL	BUL02000	-1.00	16	17615.18	25.00	43.00	2.00	2.00	0.00	MODRSS		38.43		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN16900	92.00	16	17615.18	118.50	36.40	1.16	0.76	11.00	MODRSS		44.99		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN18600	62.00	16	17615.18	102.50	30.20	1.91	1.23	147.00	MODRSS		40.74		MODTES	CR		84.00		27M0F8W			P	
DNK	DNK08900	5.00	16	17615.18	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W		28	P	
EGY	EGY02600	-7.00	16	17615.18	29.70	26.80	2.33	1.72	136.00	MODRSS		38.42		MODTES	CR		86.00		27M0F8W			P	
F	F2_A2744	-7.00	16	17615.18	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F	OCE10100	-160.00	16	17615.18	-145.00	-16.30	4.34	3.54	4.00	MODRSS		32.58		MODTES	CR		84.00		27M0F8W			P	
F /EUT	E2WA7DA2	29.00	16	17615.18	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	16	17615.18	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	16	17615.18	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	16	17615.18	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	16	17615.18	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	16	17615.18	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	16	17615.18	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
G	G 02700	-33.50	16	17615.18	-3.50	53.80	1.84	0.72	142.00	MODRSS		43.23		MODTES	CL		84.00		27M0F8W			P	
IND	IND04000	56.00	16	17615.18	73.00	25.00	1.82	1.48	58.00	MODRSS		40.14		MODTES	CR		84.00		27M0F8W			P	1
KRE	KRE28600	110.00	16	17615.18	127.00	39.10	1.30	1.10	31.00	MODRSS		42.89		MODTES	CL		87.00		27M0F8W			P	
MAU	MAU24300	29.00	16	17615.18	56.80	-13.90	1.56	1.38	65.00	MODRSS		41.12		MODTES	CL		84.00		27M0F8W			P	
MDA	MDA06300	38.00	16	17615.18	28.41	46.99	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
MLA	MLA22700	86.00	16	17615.18	102.10	4.10	1.62	0.82	135.00	MODRSS		43.21		MODTES	CL		84.00		27M0F8W			P	
MLD	MLD30600	44.00	16	17615.18	73.10	6.00	0.96	0.60	90.00	MODRSS		46.84		MODTES	CR		84.00		27M0F8W			P	
MLI	MLI32800	-37.00	16	17615.18	-7.60	13.20	1.74	1.24	171.00	MODRSS		41.11		MODTES	CL		87.00		27M0F8W			P	
MLT	MLT14700	-13.00	16	17615.18	14.30	35.90	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
NZL	CKH05300	158.00	16	17615.18	-161.00	-19.80	1.00	0.60	132.00	MODRSS		46.67		MODTES	CR		84.00		27M0F8W		4	P	
NZL	CKH05301	158.00	16	17615.18	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CR		84.00		27M0F8W		4	P	
PHL	PHL28500	98.00	16	17615.18	121.30	11.10	3.46	1.76	99.00	MODRSS		36.60		MODTES	CL		84.00		27M0F8W			P	
PLW	PLW00000	146.00	16	17615.18	132.99	5.52	1.29	0.60	55.84	MODRSS		45.55		MODTES	CL		84.00		27M0F8W			P	
RRW	RRW31000	11.00	16	17615.18	30.00	-2.10	0.66	0.60	42.00	MODRSS		48.47		MODTES	CR		84.00		27M0F8W			P	
S	SIRIUS02	5.20	16	17615.18	14.00	63.00	1.30	0.70	142.00	R13RSS		43.00		R13TES	CL		84.00		27M0F8W	SIRIUS	28	AE	
SVN	SVN14800	34.00	16	17615.18	15.01	46.18	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
ZAI	ZAI32200	-19.00	16	17615.18	22.40	0.00	2.16	1.88	48.00	MODRSS		38.36		MODTES	CL		84.00		27M0F8W			P	
BLR	BLR06200	38.00	17	17634.36	28.04	53.18	1.17	0.60	9.68	MODRSS		45.96		MODTES	CR		84.00		27M0F8W			P	
BRM	BRM29800	74.00	17	17634.36	97.10	19.10	3.58	1.48	104.00	MODRSS		37.21		MODTES	CL		84.00		27M0F8W			P	
BTN	BTN03100	86.00	17	17634.36	90.44	27.05	0.72	0.60	175.47	MODRSS		48.11		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN16700	92.00	17	17634.36	124.30	43.70	1.98	0.72	156.00	MODRSS		42.91		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN18200	79.80	17	17634.36	108.70	35.10	1.42	0.88	109.00	MODRSS		43.48		MODTES	CL		84.00		27M0F8W			P	
CME	CME30000	-13.00	17	17634.36	12.70	6.20	2.54	1.68	87.00	MODRSS		38.15		MODTES	CL		84.00		27M0F8W			P	
E	E 12900	-30.00	17	17634.36	-3.10	39.90	2.10	1.14	154.00	MODRSS		40.66		MODTES	CR		84.00		27M0F8W		17	P	
E	HISPASA4	-30.00	17	17634.36	-3.10	39.90					ECO	43.00	18.70	R13TES	CR		82.50		27M0F8W	HISPASAT-1	17	AE	
E	HISPASA6	-30.00	17	17634.36	-3.10	39.90					ECO	43.00	18.70	R13TES	CR		83.50		27M0F8W	HISPASAT-1	17	AE	
EST	EST06100	23.00	17	17634.36	25.36	59.31	0.68	0.60	2.17	MODRSS		48.37		MODTES	CR		84.00		27M0F8W			P	
F	F 09300	-19.00	17	17634.36	2.60	45.90	2.50	0.98	160.00	R13RSS		40.56		R13TES	CL		84.00		27M0F8W		19	PE	
F /EUT	E2WA7DA1	29.00	17	17634.36	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	17	17634.36	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	17	17634.36	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	17	17634.36	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	17	17634.36	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	17	17634.36	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	17	17634.36	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
GUI	GUI19200	-37.00	17	17634.36	-11.00	10.20	1.58	1.04	147.00	MODRSS		42.29		MODTES	CR		85.00		27M0F8W			P	
HRV	HRV14800	34.00	17	17634.36	16.74	44.54	0.88	0.69	5.30	MODRSS		46.57		MODTES	CR		84.00		27M0F8W			P	
IND	IND04600	68.00	17	17634.36	84.70	20.50	1.60	0.86	30.00	MODRSS		43.06		MODTES	CL		84.00		27M0F8W			P	1
INS	INS03200	80.20	17	17634.36	113.60	-1.40	6.73	3.33	160.00	MODRSS		30.94		MODTES	CR		84.00		27M0F8W			P	
LBY	LBY28000	-25.00	17	17634.36	17.50	26.30	3.68	1.84	130.00	MODRSS		36.14		MODTES	CR		84.00		27M0F8W			P	
MDG	MDG23600	29.00	17	17634.36	46.20	-18.60	2.57	0.80	67.00	MODRSS		41.32		MODTES	CR		84.00		27M0F8W			P	
NPL	NPL12200	50.00	17	17634.36	83.70	28.30	1.72	0.60	163.00	MODRSS		44.31		MODTES	CR		84.00		27M0F8W			P	
NZL	NZL28700	128.00	17	17634.36	173.00	-41.00	3.30	1.28	48.00	MODRSS		38.19		MODTES	CL		84.00		27M0F8W			P	
POL	POL13200	-1.00	17	17634.36	17.20	51.80	2.00	2.00	0.00	MODRSS		38.43		MODTES	CR		87.00		27M0F8W			P	
QAT	QAT24700	17.00	17	17634.36	51.10	25.30	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
SMR	SMR31100	-37.00	17	17634.36	12.50	43.90	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		83.00		27M0F8W			P	
SWZ	SWZ31300	-1.00	17	17634.36	31.50	-26.50	0.62	0.60	66.00	MODRSS		48.74		MODTES	CL		82.00		27M0F8W			P	
TJK	TJK06900	44.00	17	17634.36	71.14	38.37	1.25	0.76	159.15	MODRSS		44.65		MODTES	CR		84.00		27M0F8W			P	
TUR	TUR14500	5.00	17	17634.36	34.30	39.00	3.13	1.38	168.00	MODRSS		38.09		MODTES	CL		84.00		27M0F8W			P	
TZA	TZA22500	11.00	17	17634.36	34.60	-6.20	2.41	1.72	129.00	MODRSS		38.27		MODTES	CL		84.00		27M0F8W			P	
USA	PLM33700	170.00	17	17634.36	-166.30	-0.20	7.97	1.04	72.00	MODRSS		35.26		MODTES	CL		87.00		27M0F8W		9	P	
USA	PLM33701	170.00	17	17634.36	-124.80	39.10	4.43	0.73	132.00	MODRSS		39.35		MODTES	CL		87.00		27M0F8W		9	P	
USA	WAK33400	140.00	17	17634.36	152.50	11.70	7.89	3.52	0.00	MODRSS		30.01		MODTES	CR		87.00		27M0F8W		11	P	
USA	WAK33401	140.00	17	17634.36	-157.50	21.00	1.63	0.67	131.00	MODRSS		44.06		MODTES	CL		87.00		27M0F8W		11	P	
YUG	YUG14800	-7.00	17	17634.36	20.50	43.98	0.91	0.60	145.16	MODRSS		47.07		MODTES	CL		84.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
	YYY00001	11.00	17	17634.36	34.99	31.86	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	8
ALG	ALG25100	-25.00	18	17653.54	1.50	27.60	3.65	2.94	135.00	MODRSS		34.14		MODTES	CL		84.00		27M0F8W			P	
ARS	ARS27500	17.00	18	17653.54	44.60	23.40	4.21	2.48	145.00	MODRSS		34.26		MODTES	CR		84.00		27M0F8W			P	
AUS	AUS00800	164.00	18	17653.54	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CL		87.00		27M0F8W			P	
BGD	BGD22000	74.00	18	17653.54	90.30	23.60	1.46	0.84	135.00	MODRSS		43.56		MODTES	CR		84.00		27M0F8W			P	
BIH	BIH14800	34.00	18	17653.54	17.77	44.32	0.62	0.60	166.84	MODRSS		48.71		MODTES	CL		84.00		27M0F8W			P	
BOT	BOT29700	-1.00	18	17653.54	23.30	-22.20	2.13	1.50	36.00	MODRSS		39.40		MODTES	CR		85.00		27M0F8W			P	
CBG	CBG29900	68.00	18	17653.54	105.00	12.70	1.01	0.90	110.00	MODRSS		44.86		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15900	79.80	18	17653.54	106.00	32.50	5.00	3.70	150.00	MODRSS		31.78		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN18500	62.00	18	17653.54	95.70	35.40	2.10	1.14	156.00	MODRSS		40.66		MODTES	CL		84.00		27M0F8W			P	
D	D 08700	-19.00	18	17653.54	9.60	49.90	1.62	0.72	147.00	MODRSS		43.78		MODTES	CR		84.00		27M0F8W			P	2
F	F2_A2722	-7.00	18	17653.54	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2722	-7.00	18	17653.54	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2728	-7.00	18	17653.54	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2722	-7.00	18	17653.54	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A2728	-7.00	18	17653.54	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3322	-7.00	18	17653.54	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_A3328	-7.00	18	17653.54	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2722	-7.00	18	17653.54	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D2728	-7.00	18	17653.54	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3322	-7.00	18	17653.54	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3328	-7.00	18	17653.54	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA2	29.00	18	17653.54	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	18	17653.54	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	18	17653.54	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	18	17653.54	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	18	17653.54	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	18	17653.54	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	18	17653.54	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
GNB	GNB30400	-30.00	18	17653.54	-15.00	12.00	0.90	0.60	172.00	MODRSS		47.12		MODTES	CR		84.00		27M0F8W			P	
IND	IND04100	56.00	18	17653.54	78.40	16.00	2.08	1.38	35.00	MODRSS		39.87		MODTES	CR		84.00		27M0F8W			P	1
INS	INS03000	80.20	18	17653.54	113.60	-1.40	6.73	3.33	160.00	MODRSS		30.94		MODTES	CL		84.00		27M0F8W			P	
IRL	IRL21100	-33.50	18	17653.54	-8.20	53.20	0.84	0.60	162.00	MODRSS		47.42		MODTES	CL		84.00		27M0F8W			P	
KRE	KRE28600	110.00	18	17653.54	127.00	39.10	1.30	1.10	31.00	MODRSS		42.89		MODTES	CL		87.00		27M0F8W			P	
MAU	MAU24200	29.00	18	17653.54	59.80	-18.90	1.62	1.24	55.00	MODRSS		41.42		MODTES	CL		84.00		27M0F8W			P	
MHL	MHL00000	146.00	18	17653.54	167.64	9.83	2.07	0.90	157.42	MODRSS		41.75		MODTES	CL		84.00		27M0F8W			P	
MKD	MKD14800	23.00	18	17653.54	21.53	41.50	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
MLA	MLA22700	86.00	18	17653.54	102.10	4.10	1.62	0.82	135.00	MODRSS		43.21		MODTES	CL		84.00		27M0F8W			P	
MLI	MLI32700	-37.00	18	17653.54	-2.00	19.00	2.66	1.26	127.00	MODRSS		39.19		MODTES	CL		87.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
NOR	BIFROS22	-0.80	18	17653.54	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CL		84.00		27M0FXF	BIFROST-2		A	
NOR	NOR12000	5.00	18	17653.54	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W			P	
PAK	PAK28100	38.00	18	17653.54	65.20	27.90	1.52	1.42	28.00	MODRSS		41.11		MODTES	CL		84.00		27M0F8W			P	
PHL	PHL28500	98.00	18	17653.54	121.30	11.10	3.46	1.76	99.00	MODRSS		36.60		MODTES	CL		84.00		27M0F8W			P	
SOM	SOM31200	23.00	18	17653.54	45.00	6.40	3.26	1.54	71.00	MODRSS		37.44		MODTES	CL		84.00		27M0F8W			P	
TCD	TCD14300	-13.00	18	17653.54	18.10	15.50	3.40	1.72	107.00	MODRSS		36.78		MODTES	CR		84.00		27M0F8W			P	
YEM	YEM26600	11.00	18	17653.54	44.36	15.70	0.77	0.60	104.23	MODRSS		47.78		MODTES	CL		84.00		27M0F8W			P	
ZAI	ZAI32300	-19.00	18	17653.54	21.30	-6.80	2.80	1.52	149.00	MODRSS		38.16		MODTES	CL		84.00		27M0F8W			P	
AUS	AUS00400	152.00	19	17672.72	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040A	152.00	19	17672.72	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040B	152.00	19	17672.72	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040C	152.00	19	17672.72	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS00700	164.00	19	17672.72	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CR		87.00		27M0F8W		77	P	
AUS	AUS0070A	164.00	19	17672.72	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		77	P	
BEN	BEN23300	-19.00	19	17672.72	2.20	9.50	1.44	0.68	97.00	MODRSS		44.54		MODTES	CR		84.00		27M0F8W			P	
BRM	BRM29800	74.00	19	17672.72	97.10	19.10	3.58	1.48	104.00	MODRSS		37.21		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15800	79.80	19	17672.72	106.00	32.50	5.00	3.70	150.00	MODRSS		31.78		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN17900	92.00	19	17672.72	112.20	21.90	1.84	1.22	37.00	MODRSS		40.94		MODTES	CR		84.00		27M0F8W			P	
COM	COM2070A	29.00	19	17672.72	44.10	-12.10	0.76	0.60	149.00	MODRSS		47.86		MODTES	CR		84.00		27M0F8W			P	
F	F2_A2733	-7.00	19	17672.72	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		84.00		27M0F9W	RADIOSAT-2	19	A	
F /EUT	E2WA7DA1	29.00	19	17672.72	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	19	17672.72	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	19	17672.72	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	19	17672.72	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	19	17672.72	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	19	17672.72	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	19	17672.72	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
FSM	FSM00000	146.00	19	17672.72	151.67	5.42	5.34	1.51	166.52	MODRSS		35.37		MODTES	CR		84.00		27M0F8W			P	
GAB	GAB26000	-13.00	19	17672.72	11.80	-0.60	1.43	1.12	64.00	MODRSS		42.40		MODTES	CL		84.00		27M0F8W			P	
GMB	GMB30200	-37.00	19	17672.72	-15.10	13.40	0.79	0.60	4.00	MODRSS		47.69		MODTES	CR		83.00		27M0F8W			P	
GRC	GRC10500	5.00	19	17672.72	24.50	38.00	2.03	1.29	159.00	MODRSS		40.27		MODTES	CL		84.00		27M0F8W			P	
IND	IND03800	56.00	19	17672.72	75.90	33.40	1.52	1.08	33.00	MODRSS		42.29		MODTES	CL		84.00		27M0F8W			P	1
INS	INS03200	80.20	19	17672.72	113.60	-1.40	6.73	3.33	160.00	MODRSS		30.94		MODTES	CR		84.00		27M0F8W			P	
INS	INS03600	104.00	19	17672.72	115.20	-1.70	9.14	3.43	170.00	MODRSS		29.48		MODTES	CL		84.00		27M0F8W			P	
IRN	IRN10900	34.00	19	17672.72	54.20	32.40	3.82	1.82	149.00	MODRSS		36.03		MODTES	CR		84.00		27M0F8W			P	
KIR	KIR00002	176.00	19	17672.72	-157.78	-0.33	2.40	0.64	110.62	MODRSS		42.60		MODTES	CL		84.00		27M0F8W			P	
LBN	LBN27900	11.00	19	17672.72	35.90	33.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
LBR	LBR2440A	-33.50	19	17672.72	-9.30	6.60	1.22	0.70	133.00	MODRSS		45.13		MODTES	CL		84.00		27M0F8W			P	
LBY	LBY32100	-25.00	19	17672.72	17.50	26.30	3.68	1.84	130.00	MODRSS		36.14		MODTES	CR		84.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
LIE	LIE25300	-37.00	19	17672.72	9.50	47.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
LTU	LTU06100	23.00	19	17672.72	24.02	55.46	0.72	0.60	173.90	MODRSS		48.11		MODTES	CR		84.00		27M0F8W			P	
LUX	LUX11400	-19.00	19	17672.72	6.00	49.80	0.68	0.68	0.00	MODRSS		47.80		MODTES	CL		84.00		27M0F8W			P	
NPL	NPL12200	50.00	19	17672.72	83.70	28.30	1.72	0.60	163.00	MODRSS		44.31		MODTES	CR		84.00		27M0F8W			P	
NZL	NIU05400	158.00	19	17672.72	-169.80	-19.00	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W		2	P	
NZL	NIU05401	158.00	19	17672.72	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CR		84.00		27M0F8W		2	P	
POR	POR13300	-30.00	19	17672.72	-8.00	39.60	0.92	0.60	112.00	MODRSS		47.03		MODTES	CR		84.00		27M0F8W			P	
ROU	ROU13600	-1.00	19	17672.72	25.00	45.70	1.38	0.66	155.00	MODRSS		44.85		MODTES	CR		86.00		27M0F8W			P	
SVK	SVK14400	17.00	19	17672.72	19.65	48.69	0.82	0.60	5.20	MODRSS		47.53		MODTES	CL		84.00		27M0F8W			P	
UKR	UKR06300	38.00	19	17672.72	31.82	48.19	2.32	0.95	177.32	MODRSS		41.01		MODTES	CR		84.00		27M0F8W			P	
USA	MRA33200	122.00	19	17672.72	151.10	11.60	6.48	3.49	179.00	MODRSS		30.90		MODTES	CL		87.00		27M0F8W		14	P	
USA	MRA33201	122.00	19	17672.72	-157.50	21.00	2.02	0.60	115.00	MODRSS		43.61		MODTES	CL		87.00		27M0F8W		14	P	
USA	SMA33500	170.00	19	17672.72	-166.30	-0.20	7.97	1.04	72.00	MODRSS		35.26		MODTES	CR		87.00		27M0F8W		13	P	
USA	SMA33501	170.00	19	17672.72	-124.80	39.20	4.43	0.73	132.00	MODRSS		39.35		MODTES	CR		87.00		27M0F8W		13	P	
UZB	UZB07100	44.00	19	17672.72	64.01	41.21	2.67	0.96	163.32	MODRSS		40.37		MODTES	CR		84.00		27M0F8W			P	
ALG	ALG25200	-25.00	20	17691.90	1.50	27.60	3.65	2.94	135.00	MODRSS		34.14		MODTES	CL		84.00		27M0F8W			P	
AND	AND34100	-37.00	20	17691.90	1.60	42.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
ARS	ARS00300	17.00	20	17691.90	44.60	23.40	4.21	2.48	145.00	MODRSS		34.26		MODTES	CR		84.00		27M0F8W			P	
AUS	AUS00500	152.00	20	17691.90	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CR		87.00		27M0F8W			P	
AUT	AUT01600	-19.00	20	17691.90	12.20	47.50	1.14	0.63	166.00	MODRSS		45.88		MODTES	CR		84.00		27M0F8W			P	
AZE	AZE06400	23.00	20	17691.90	47.47	40.14	0.93	0.60	158.14	MODRSS		46.98		MODTES	CL		84.00		27M0F8W			P	4
BGD	BGD22000	74.00	20	17691.90	90.30	23.60	1.46	0.84	135.00	MODRSS		43.56		MODTES	CR		84.00		27M0F8W			P	
BUL	BUL02000	-1.00	20	17691.90	25.00	43.00	2.00	2.00	0.00	MODRSS		38.43		MODTES	CL		84.00		27M0F8W			P	
CBG	CBG29900	68.00	20	17691.90	105.00	12.70	1.01	0.90	110.00	MODRSS		44.86		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15900	79.80	20	17691.90	106.00	32.50	5.00	3.70	150.00	MODRSS		31.78		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN18400	62.00	20	17691.90	101.00	37.90	2.78	0.82	144.00	MODRSS		40.87		MODTES	CL		84.00		27M0F8W			P	
DNK	DNK08901	5.00	20	17691.90	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W		29	P	
EGY	EGY02600	-7.00	20	17691.90	29.70	26.80	2.33	1.72	136.00	MODRSS		38.42		MODTES	CR		86.00		27M0F8W			P	
F	F2_A2744	-7.00	20	17691.90	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F /EUT	E2WA7DA2	29.00	20	17691.90	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	20	17691.90	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	20	17691.90	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	20	17691.90	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	20	17691.90	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	20	17691.90	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	20	17691.90	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
G	G 02700	-33.50	20	17691.90	-3.50	53.80	1.84	0.72	142.00	MODRSS		43.23		MODTES	CL		84.00		27M0F8W			P	4
IND	IND04200	68.00	20	17691.90	79.30	27.70	2.14	1.16	147.00	MODRSS		40.50		MODTES	CR		89.00		27M0F8W			P	1
INS	INS03000	80.20	20	17691.90	113.60	-1.40	6.73	3.33	160.00	MODRSS		30.94		MODTES	CL		84.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
KRE	KRE28600	110.00	20	17691.90	127.00	39.10	1.30	1.10	31.00	MODRSS		42.89		MODTES	CL		87.00		27M0F8W			P	3, 4
MDA	MDA06300	38.00	20	17691.90	28.41	46.99	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	4, 7
MLA	MLA22700	86.00	20	17691.90	102.10	4.10	1.62	0.82	135.00	MODRSS		43.21		MODTES	CL		84.00		27M0F8W			P	
MLI	MLI32800	-37.00	20	17691.90	-7.60	13.20	1.74	1.24	171.00	MODRSS		41.11		MODTES	CL		87.00		27M0F8W			P	
MLT	MLT1470A	-13.00	20	17691.90	14.30	35.90	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	4, 7
NZL	TKL05800	158.00	20	17691.90	-171.80	-8.90	0.70	0.60	35.00	MODRSS		48.21		MODTES	CL		84.00		27M0F8W		1	P	
NZL	TKL05801	158.00	20	17691.90	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CL		84.00		27M0F8W		1	P	
PAK	PAK28200	38.00	20	17691.90	68.50	25.80	1.32	0.62	133.00	MODRSS		45.32		MODTES	CL		84.00		27M0F8W			P	
PHL	PHL28500	98.00	20	17691.90	121.30	11.10	3.46	1.76	99.00	MODRSS		36.60		MODTES	CL		84.00		27M0F8W			P	
PLW	PLW00000	146.00	20	17691.90	132.99	5.52	1.29	0.60	55.84	MODRSS		45.55		MODTES	CL		84.00		27M0F8W			P	4
RRW	RRW31000	11.00	20	17691.90	30.00	-2.10	0.66	0.60	42.00	MODRSS		48.47		MODTES	CR		84.00		27M0F8W			P	
S	SIRIUS03	5.20	20	17691.90	14.00	63.00	1.30	0.70	142.00	R13RSS		43.00		R13TES	CL		84.00		27M0F8W	SIRIUS	29	AE	
SVN	SVN14800	34.00	20	17691.90	15.01	46.18	0.60	0.60	90.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	4
ZAI	ZAI32200	-19.00	20	17691.90	22.40	0.00	2.16	1.88	48.00	MODRSS		38.36		MODTES	CL		84.00		27M0F8W			P	
ALB	ALB29600	-7.00	21	17711.08	20.10	41.00	1.17	0.65	128.00	MODRSS		45.64		MODTES	CL		84.00		27M0F8W			P	
BEL	BEL01800	-19.00	21	17711.08	4.60	50.60	0.82	0.60	167.00	MODRSS		47.53		MODTES	CL		84.00		27M0F8W			P	
BFA	BFA10700	-30.00	21	17711.08	-1.50	12.20	1.45	1.14	29.00	MODRSS		42.26		MODTES	CL		84.00		27M0F8W			P	4
BRM	BRM29800	74.00	21	17711.08	97.10	19.10	3.58	1.48	104.00	MODRSS		37.21		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN17500	92.00	21	17711.08	121.40	23.80	1.14	0.82	64.00	MODRSS		44.74		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN17600	79.80	21	17711.08	113.70	33.90	1.20	0.80	141.00	MODRSS		44.62		MODTES	CL		84.00		27M0F8W			P	
CYP	CYP08600	5.00	21	17711.08	33.30	35.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
D	D2-21600	-1.00	21	17711.08	12.60	52.10	0.83	0.63	172.00	MODRSS		47.26		MODTES	CR		84.00		27M0F8W			P	4, 7
DJI	DJI09900	23.00	21	17711.08	42.50	11.60	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
E	HISPASA2	-30.00	21	17711.08	-8.80	35.40	3.00	1.90	45.00	MODRSS		36.90		MODTES	CR		84.00		27M0F8W	HISPASAT-2	22	A	4
F	F 09306	-7.00	21	17711.08	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		27M0F8W	RADIOSAT	19	A	
F	F3_A2751	-7.00	21	17711.08	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3351	-7.00	21	17711.08	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2751	-7.00	21	17711.08	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		69.40		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3351	-7.00	21	17711.08	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		69.40		33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	21	17711.08	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	21	17711.08	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	21	17711.08	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	21	17711.08	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	21	17711.08	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	21	17711.08	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	21	17711.08	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
IND	IND03800	56.00	21	17711.08	75.90	33.40	1.52	1.08	33.00	MODRSS		42.29		MODTES	CL		84.00		27M0F8W			P	1
INS	INS03200	80.20	21	17711.08	113.60	-1.40	6.73	3.33	160.00	MODRSS		30.94		MODTES	CR		84.00		27M0F8W			P	
ISL	ISL04900	-33.50	21	17711.08	-19.00	64.90	1.00	0.60	177.00	MODRSS		46.67		MODTES	CR		82.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
KEN	KEN24900	11.00	21	17711.08	37.90	1.10	2.29	1.56	94.00	MODRSS		38.92		MODTES	CL		84.00		27M0F8W			P	
LVA	LVA06100	23.00	21	17711.08	24.53	56.20	0.83	0.60	0.05	MODRSS		47.50		MODTES	CR		84.00		27M0F8W			P	4
MCO	MCO11600	-37.00	21	17711.08	7.40	43.70	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		83.00		27M0F8W			P	
NPL	NPL12200	50.00	21	17711.08	83.70	28.30	1.72	0.60	163.00	MODRSS		44.31		MODTES	CR		84.00		27M0F8W			P	
NZL	NZL28700	128.00	21	17711.08	173.00	-41.00	3.30	1.28	48.00	MODRSS		38.19		MODTES	CL		84.00		27M0F8W			P	
TON	TON21500	170.00	21	17711.08	-174.70	-18.00	1.41	0.68	85.00	MODRSS		44.63		MODTES	CR		84.00		27M0F8W			P	
UAE	UAE27400	17.00	21	17711.08	53.60	24.40	0.98	0.80	162.00	MODRSS		45.50		MODTES	CL		84.00		27M0F8W			P	
USA	GUM33100	122.00	21	17711.08	151.10	11.60	6.48	3.49	179.00	MODRSS		30.90		MODTES	CR		87.00		27M0F8W		15	P	
USA	GUM33101	122.00	21	17711.08	-157.50	21.00	2.02	0.60	115.00	MODRSS		43.61		MODTES	CR		87.00		27M0F8W		15	P	
AUS	AUS00800	164.00	22	17730.26	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CL		87.00		27M0F8W			P	
BDI	BDI27000	11.00	22	17730.26	29.90	-3.10	0.71	0.60	80.00	MODRSS		48.15		MODTES	CR		84.00		27M0F8W			P	
BGD	BGD22000	74.00	22	17730.26	90.30	23.60	1.46	0.84	135.00	MODRSS		43.56		MODTES	CR		84.00		27M0F8W			P	
CBG	CBG29900	68.00	22	17730.26	105.00	12.70	1.01	0.90	110.00	MODRSS		44.86		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15900	79.80	22	17730.26	106.00	32.50	5.00	3.70	150.00	MODRSS		31.78		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN16800	92.00	22	17730.26	124.80	48.10	2.68	0.92	157.00	MODRSS		40.53		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN18300	62.00	22	17730.26	104.80	39.00	1.48	0.60	142.00	MODRSS		44.96		MODTES	CL		84.00		27M0F8W			P	
COG	COG23500	-13.00	22	17730.26	14.60	-0.70	2.02	1.18	59.00	MODRSS		40.67		MODTES	CR		84.00		27M0F8W			P	
CTI	CTI23700	-30.00	22	17730.26	-5.80	7.40	1.55	1.43	162.00	MODRSS		40.99		MODTES	CR		84.00		27M0F8W			P	4
F	F2aA2762	-7.00	22	17730.26	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2762	-7.00	22	17730.26	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3362	-7.00	22	17730.26	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2762	-7.00	22	17730.26	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3362	-7.00	22	17730.26	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	REU09700	29.00	22	17730.26	55.60	-19.20	1.56	0.78	96.00	MODRSS		43.59		MODTES	CL		84.00		27M0F8W		5	P	
F	REU09701	29.00	22	17730.26	3.70	45.20	1.94	1.68	24.00	MODRSS		39.32		MODTES	CL		84.00		27M0F8W		5	P	
F /EUT	E2WA7DA2	29.00	22	17730.26	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	22	17730.26	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	22	17730.26	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	22	17730.26	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	22	17730.26	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	22	17730.26	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	22	17730.26	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
FIN	FIN10400	5.00	22	17730.26	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W			P	
G	G UKDBS	-33.50	22	17730.26	-3.50	53.80	1.84	0.72	142.00	MODRSS		43.20		MODTES	CL		84.00		27M0F8W	UKDBS-3		A	4
GEO	GEO06400	23.00	22	17730.26	43.35	42.27	1.11	0.60	161.21	MODRSS		46.23		MODTES	CL		84.00		27M0F8W			P	4
HNG	HNG10600	-1.00	22	17730.26	22.20	45.60	2.00	2.00	0.00	MODRSS		38.43		MODTES	CL		84.00		27M0F8W			P	
IND	IND04200	68.00	22	17730.26	79.30	27.70	2.14	1.16	147.00	MODRSS		40.50		MODTES	CR		89.00		27M0F8W			P	1
INS	INS03000	80.20	22	17730.26	113.60	-1.40	6.73	3.33	160.00	MODRSS		30.94		MODTES	CL		84.00		27M0F8W			P	
KGZ	KGZ07000	44.00	22	17730.26	73.88	41.32	1.34	0.64	3.53	MODRSS		45.12		MODTES	CR		84.00		27M0F8W			P	4, 7

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
KRE	KRE28600	110.00	22	17730.26	127.00	39.10	1.30	1.10	31.00	MODRSS		42.89		MODTES	CL		87.00		27M0F8W			P	3, 4
KWT	KWT11300	17.00	22	17730.26	47.60	29.20	0.68	0.60	145.00	MODRSS		48.34		MODTES	CR		84.00		27M0F8W			P	
MLA	MLA22700	86.00	22	17730.26	102.10	4.10	1.62	0.82	135.00	MODRSS		43.21		MODTES	CL		84.00		27M0F8W			P	
MTN	MTN22300	-37.00	22	17730.26	-12.20	18.50	2.62	1.87	150.00	MODRSS		37.55		MODTES	CL		86.00		27M0F8W			P	
PAK	PAK28100	38.00	22	17730.26	65.20	27.90	1.52	1.42	28.00	MODRSS		41.11		MODTES	CL		84.00		27M0F8W			P	
PHL	PHL28500	98.00	22	17730.26	121.30	11.10	3.46	1.76	99.00	MODRSS		36.60		MODTES	CL		84.00		27M0F8W			P	
SDN	SDN23100	-7.00	22	17730.26	29.90	12.90	2.64	2.08	155.00	MODRSS		37.05		MODTES	CR		86.00		27M0F8W			P	
SUI	SUI14000	-19.00	22	17730.26	8.20	46.60	0.98	0.70	171.00	MODRSS		46.08		MODTES	CR		84.00		27M0F8W			P	2
SYR	SYR22900	11.00	22	17730.26	38.30	34.90	1.04	0.90	7.00	MODRSS		44.73		MODTES	CL		84.00		27M0F8W			P	
TUN	TUN15000	-25.00	22	17730.26	9.50	33.50	1.88	0.72	135.00	MODRSS		43.13		MODTES	CL		84.00		27M0F8W			P	
AGL	AGL29500	-13.00	23	17749.44	16.50	-12.00	3.09	2.26	84.00	MODRSS		36.01		MODTES	CL		84.00		27M0F8W			P	
ARS	ARS34000	17.00	23	17749.44	44.60	23.40	4.21	2.48	145.00	MODRSS		34.28		MODTES	CL		84.00		27M0F8W		71	P	
AUS	AUS00400	152.00	23	17749.44	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CL		87.00		27M0F8W		76	P	
AUS	AUS0040A	152.00	23	17749.44	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	4
AUS	AUS0040B	152.00	23	17749.44	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	4
AUS	AUS0040C	152.00	23	17749.44	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	CL		87.00		27M0F8W		76	P	4
AUS	AUS00700	164.00	23	17749.44	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CR		87.00		27M0F8W		77	P	
AUS	AUS0070A	164.00	23	17749.44	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		77	P	4
BHR	BHR2550A	17.00	23	17749.44	50.50	26.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W		71	P	4
BRM	BRM29800	74.00	23	17749.44	97.10	19.10	3.58	1.48	104.00	MODRSS		37.21		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN15800	79.80	23	17749.44	106.00	32.50	5.00	3.70	150.00	MODRSS		31.78		MODTES	CL		84.00		27M0F8W			P	
CVA	CVA08500	-37.00	23	17749.44	10.80	41.50	2.00	0.60	138.00	MODRSS		43.66		MODTES	CR		84.00		27M0F8W			P	
CZE	CZE14400	17.00	23	17749.44	15.50	49.79	0.92	0.60	174.55	MODRSS		47.02		MODTES	CR		84.00		27M0F8W			P	4
E	CNR13000	-30.00	23	17749.44	-15.70	28.40	1.54	0.60	5.00	MODRSS		44.79		MODTES	CR		84.00		27M0F8W		22	P	4
E	HISPASA2	-30.00	23	17749.44	-8.80	35.40	3.00	1.90	45.00	MODRSS		36.90		MODTES	CR		84.00		27M0F8W	HISPASAT-2	22	A	4
ERI	ERI09200	23.00	23	17749.44	39.41	14.98	1.67	0.95	145.48	MODRSS		42.44		MODTES	CL		84.00		27M0F8W			P	4
F	F2aA2773	-7.00	23	17749.44	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2773	-7.00	23	17749.44	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3373	-7.00	23	17749.44	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2773	-7.00	23	17749.44	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3373	-7.00	23	17749.44	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	23	17749.44	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	23	17749.44	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	23	17749.44	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	23	17749.44	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	23	17749.44	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	23	17749.44	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	23	17749.44	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
GHA	GHA10800	-25.00	23	17749.44	-1.20	7.90	1.48	1.06	102.00	MODRSS		42.49		MODTES	CR		83.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
GNE	GNE30300	-19.00	23	17749.44	10.30	1.50	0.68	0.60	10.00	MODRSS		48.34		MODTES	CR		84.00		27M0F8W			P	
HOL	HOL21300	-19.00	23	17749.44	5.40	52.00	0.76	0.60	171.00	MODRSS		47.86		MODTES	CL		84.00		27M0F8W			P	
IND	IND04600	68.00	23	17749.44	84.70	20.50	1.60	0.86	30.00	MODRSS		43.06		MODTES	CL		84.00		27M0F8W			P	1
INS	INS03200	80.20	23	17749.44	113.60	-1.40	6.73	3.33	160.00	MODRSS		30.94		MODTES	CR		84.00		27M0F8W			P	
ISL	ISL05000	5.00	23	17749.44	-19.50	61.00	2.20	0.80	4.00	MODRSS		41.99		MODTES	CL		84.00		27M0F8W			P	
JOR	JOR22400	11.00	23	17749.44	35.80	31.40	0.84	0.78	114.00	MODRSS		46.28		MODTES	CR		85.00		27M0F8W			P	
KIR	KIR00002	176.00	23	17749.44	-157.78	-0.33	2.40	0.64	110.62	MODRSS		42.60		MODTES	CL		84.00		27M0F8W			P	
NOR	BIFROS21	-0.80	23	17749.44	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CR		84.00		27M0FXF	BIFROST-2		A	
NPL	NPL1220A	50.00	23	17749.44	83.70	28.30	1.72	0.60	163.00	MODRSS		44.31		MODTES	CR		84.00		27M0F8W			P	4, 7
NZL	NIU05400	158.00	23	17749.44	-169.80	-19.00	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W		2	P	
NZL	NIU05401	158.00	23	17749.44	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CR		84.00		27M0F8W		2	P	
SDN	SDN23000	-7.00	23	17749.44	29.90	9.80	2.95	2.17	123.00	MODRSS		36.38		MODTES	CL		86.00		27M0F8W			P	
SRL	SRL25900	-33.50	23	17749.44	-11.80	8.60	0.78	0.68	114.00	MODRSS		47.20		MODTES	CL		84.00		27M0F8W			P	4
TKM	TKM06800	44.00	23	17749.44	59.18	38.84	2.25	0.99	164.51	MODRSS		40.94		MODTES	CL		84.00		27M0F8W			P	4, 7
ZWE	ZWE13500	-1.00	23	17749.44	29.60	-18.80	1.46	1.36	37.00	MODRSS		41.47		MODTES	CR		85.00		27M0F8W			P	
ARM	ARM06400	23.00	24	17768.62	44.99	39.95	0.73	0.60	148.17	MODRSS		48.02		MODTES	CL		84.00		27M0F8W			P	4
AUS	AUS00500	152.00	24	17768.62	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CR		87.00		27M0F8W			P	
CAF	CAF25800	-13.00	24	17768.62	21.00	6.30	2.25	1.68	31.00	MODRSS		38.67		MODTES	CR		84.00		27M0F8W			P	
CBG	CBG29900	68.00	24	17768.62	105.00	12.70	1.01	0.90	110.00	MODRSS		44.86		MODTES	CL		84.00		27M0F8W			P	
CHN	CHN16600	92.00	24	17768.62	121.10	41.70	1.52	0.78	154.00	MODRSS		43.71		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN17700	79.80	24	17768.62	111.80	30.80	1.42	0.82	160.00	MODRSS		43.79		MODTES	CR		84.00		27M0F8W			P	
CHN	CHN18800	62.00	24	17768.62	101.50	25.10	1.86	1.08	132.00	MODRSS		41.42		MODTES	CR		84.00		27M0F8W			P	
DNK	DNK09000	5.00	24	17768.62	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W			P	
F	F2_A2788	-7.00	24	17768.62	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2784	-7.00	24	17768.62	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2788	-7.00	24	17768.62	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2784	-7.00	24	17768.62	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A2788	-7.00	24	17768.62	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3384	-7.00	24	17768.62	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_A3388	-7.00	24	17768.62	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2784	-7.00	24	17768.62	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D2788	-7.00	24	17768.62	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3384	-7.00	24	17768.62	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3388	-7.00	24	17768.62	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	MYT09800	29.00	24	17768.62	45.10	-12.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W		7	P	
F	MYT09801	29.00	24	17768.62	3.60	45.60	1.97	1.71	22.00	MODRSS		39.17		MODTES	CL		84.00		27M0F8W		7	P	
F /EUT	E2WA7DA2	29.00	24	17768.62	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	24	17768.62	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	24	17768.62	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F /EUT	E2WA7DD2	29.00	24	17768.62	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	24	17768.62	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	24	17768.62	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	24	17768.62	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
I	I 08200	-19.00	24	17768.62	12.30	41.30	2.38	0.98	137.00	MODRSS		40.77		MODTES	CR		84.00		27M0F8W			P	
IND	IND04100	56.00	24	17768.62	78.40	16.00	2.08	1.38	35.00	MODRSS		39.87		MODTES	CR		84.00		27M0F8W			P	1
INS	INS03000	80.20	24	17768.62	113.60	-1.40	6.73	3.33	160.00	MODRSS		30.94		MODTES	CL		84.00		27M0F8W			P	
IRQ	IRQ25600	11.00	24	17768.62	43.50	33.00	2.28	1.32	145.00	MODRSS		39.66		MODTES	CL		84.00		27M0F8W			P	
KAZ	KAZ06600	44.00	24	17768.62	64.72	46.40	4.31	1.70	172.22	MODRSS		35.79		MODTES	CR		84.00		27M0F8W			P	4, 7
LSO	LSO30500	5.00	24	17768.62	27.80	-29.80	0.66	0.60	36.00	MODRSS		48.47		MODTES	CL		84.00		27M0F8W			P	
MLA	MLA22700	86.00	24	17768.62	102.10	4.10	1.62	0.82	135.00	MODRSS		43.21		MODTES	CL		84.00		27M0F8W			P	
MTN	MTN28800	-37.00	24	17768.62	-7.80	23.40	1.63	1.10	141.00	MODRSS		41.91		MODTES	CL		86.00		27M0F8W			P	
MWI	MWI30800	-1.00	24	17768.62	34.10	-13.00	1.54	0.60	87.00	MODRSS		44.79		MODTES	CL		84.00		27M0F8W			P	
NGR	NGR11500	-25.00	24	17768.62	8.30	16.80	2.54	2.08	44.00	MODRSS		37.22		MODTES	CL		85.00		27M0F8W			P	
NOR	BIFROS22	-0.80	24	17768.62	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CL		84.00		27M0FXF	BIFROST-2		A	
NZL	TKL05800	158.00	24	17768.62	-171.80	-8.90	0.70	0.60	35.00	MODRSS		48.21		MODTES	CL		84.00		27M0F8W		1	P	
NZL	TKL05801	158.00	24	17768.62	172.30	-39.70	2.88	1.56	47.00	MODRSS		37.92		MODTES	CL		84.00		27M0F8W		1	P	
OMA	OMA12300	17.00	24	17768.62	55.60	21.00	1.88	1.02	100.00	MODRSS		41.62		MODTES	CR		85.00		27M0F8W			P	
PAK	PAK28200	38.00	24	17768.62	68.50	25.80	1.32	0.62	133.00	MODRSS		45.32		MODTES	CL		84.00		27M0F8W			P	
PHL	PHL28500	98.00	24	17768.62	121.30	11.10	3.46	1.76	99.00	MODRSS		36.60		MODTES	CL		84.00		27M0F8W			P	
POR	AZR13400	-30.00	24	17768.62	-23.40	36.10	2.56	0.70	158.00	MODRSS		41.91		MODTES	CL		84.00		27M0F8W			P	
SDN	SDN23200	-7.00	24	17768.62	29.60	18.40	2.54	2.09	167.00	MODRSS		37.20		MODTES	CR		86.00		27M0F8W			P	
ALB	ALB29600	-7.00	25	17787.80	20.10	41.00	1.17	0.65	128.00	MODRSS		45.64		MODTES	CL		84.00		27M0F8W			P	
AUS	AUS00900	164.00	25	17787.80	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CR		87.00		27M0F8W		78	P	
AUS	AUS0090A	164.00	25	17787.80	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		78	P	4
AUS	AUS0090B	164.00	25	17787.80	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		78	P	4
BEL	BEL01800	-19.00	25	17787.80	4.60	50.60	0.82	0.60	167.00	MODRSS		47.53		MODTES	CL		84.00		27M0F8W			P	
BFA	BFA10700	-30.00	25	17787.80	-1.50	12.20	1.45	1.14	29.00	MODRSS		42.26		MODTES	CL		84.00		27M0F8W			P	4
CYP	CYP08600	5.00	25	17787.80	33.30	35.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
D	D2-21600	-1.00	25	17787.80	12.60	52.10	0.83	0.63	172.00	MODRSS		47.26		MODTES	CR		84.00		27M0F8W			P	4, 7
DJI	DJI09900	23.00	25	17787.80	42.50	11.60	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
E	HISPASA2	-30.00	25	17787.80	-8.80	35.40	3.00	1.90	45.00	MODRSS		36.90		MODTES	CR		84.00		27M0F8W	HISPASAT-2	22	A	4
F	F 09306	-7.00	25	17787.80	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		27M0F8W	RADIOSAT	19	A	
F	F3_A2751	-7.00	25	17787.80	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3351	-7.00	25	17787.80	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2751	-7.00	25	17787.80	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3351	-7.00	25	17787.80	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	25	17787.80	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	25	17787.80	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F /EUT	E2WA7DC1	29.00	25	17787.80	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	25	17787.80	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	25	17787.80	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	25	17787.80	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	25	17787.80	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
ISL	ISL04900	-33.50	25	17787.80	-19.00	64.90	1.00	0.60	177.00	MODRSS		46.67		MODTES	CR		82.00		27M0F8W			P	
KEN	KEN24900	11.00	25	17787.80	37.90	1.10	2.29	1.56	94.00	MODRSS		38.92		MODTES	CL		84.00		27M0F8W			P	
LVA	LVA06100	23.00	25	17787.80	24.53	56.20	0.83	0.60	0.05	MODRSS		47.50		MODTES	CR		84.00		27M0F8W			P	4
MCO	MCO11600	-37.00	25	17787.80	7.40	43.70	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		83.00		27M0F8W			P	
MNG	MNG24800	74.00	25	17787.80	107.50	47.80	2.00	2.00	0.00	MODRSS		38.43		MODTES	CR		89.02		27M0F8W			P	
RUS	RSTRSA11	36.00	25	17787.80	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	25	17787.80	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	25	17787.80	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	25	17787.80	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	25	17787.80	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	25	17787.80	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	25	17787.80	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	25	17787.80	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-5	42	P	
RUS	RUS00400	110.00	25	17787.80	118.22	51.52					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W			P	3, 4
TON	TON21500	170.00	25	17787.80	-174.70	-18.00	1.41	0.68	85.00	MODRSS		44.63		MODTES	CR		84.00		27M0F8W			P	
UAE	UAE27400	17.00	25	17787.80	53.60	24.40	0.98	0.80	162.00	MODRSS		45.50		MODTES	CL		84.00		27M0F8W			P	
USA	GUM33100	122.00	25	17787.80	151.10	11.60	6.48	3.49	179.00	MODRSS		30.90		MODTES	CR		87.00		27M0F8W		15	P	
USA	GUM33101	122.00	25	17787.80	-157.50	21.00	2.02	0.60	115.00	MODRSS		43.61		MODTES	CR		87.00		27M0F8W		15	P	
AUS	AUS00600	152.00	26	17806.98	135.50	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CR		87.00		27M0F8W			P	
BDI	BDI27000	11.00	26	17806.98	29.90	-3.10	0.71	0.60	80.00	MODRSS		48.15		MODTES	CR		84.00		27M0F8W			P	
COG	COG23500	-13.00	26	17806.98	14.60	-0.70	2.02	1.18	59.00	MODRSS		40.67		MODTES	CR		84.00		27M0F8W			P	
CTI	CTI23700	-30.00	26	17806.98	-5.80	7.40	1.55	1.43	162.00	MODRSS		40.99		MODTES	CR		84.00		27M0F8W			P	4, 7
F	F2aA2762	-7.00	26	17806.98	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2762	-7.00	26	17806.98	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3362	-7.00	26	17806.98	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2762	-7.00	26	17806.98	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3362	-7.00	26	17806.98	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	REU09700	29.00	26	17806.98	55.60	-19.20	1.56	0.78	96.00	MODRSS		43.59		MODTES	CL		84.00		27M0F8W		5	P	
F	REU09701	29.00	26	17806.98	3.70	45.20	1.94	1.68	24.00	MODRSS		39.32		MODTES	CL		84.00		27M0F8W		5	P	
F /EUT	E2WA7DA2	29.00	26	17806.98	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	26	17806.98	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	26	17806.98	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	26	17806.98	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	26	17806.98	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F /EUT	E2WA7DF2	29.00	26	17806.98	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	26	17806.98	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
FIN	FIN10400	5.00	26	17806.98	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W			P	
G	G UKDBS	-33.50	26	17806.98	-3.50	53.80	1.84	0.72	142.00	MODRSS		43.20		MODTES	CL		84.00		27M0F8W	UKDBS-3		A	4
GEO	GEO06400	23.00	26	17806.98	43.35	42.27	1.11	0.60	161.21	MODRSS		46.23		MODTES	CL		84.00		27M0F8W			P	4
HNG	HNG10600	-1.00	26	17806.98	22.20	45.60	2.00	2.00	0.00	MODRSS		38.43		MODTES	CL		84.00		27M0F8W			P	
KGZ	KGZ07000	44.00	26	17806.98	73.88	41.32	1.34	0.64	3.53	MODRSS		45.12		MODTES	CR		84.00		27M0F8W			P	4, 7
KWT	KWT11300	17.00	26	17806.98	47.60	29.20	0.68	0.60	145.00	MODRSS		48.34		MODTES	CR		84.00		27M0F8W			P	
MTN	MTN22300	-37.00	26	17806.98	-12.20	18.50	2.62	1.87	150.00	MODRSS		37.55		MODTES	CL		86.00		27M0F8W			P	
RUS	RSTRSA12	36.00	26	17806.98	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	26	17806.98	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	26	17806.98	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	26	17806.98	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	26	17806.98	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	26	17806.98	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	26	17806.98	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	26	17806.98	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-5	42	P	
SDN	SDN23100	-7.00	26	17806.98	29.90	12.90	2.64	2.08	155.00	MODRSS		37.05		MODTES	CR		86.00		27M0F8W			P	
SUI	SUI14000	-19.00	26	17806.98	8.20	46.60	0.98	0.70	171.00	MODRSS		46.08		MODTES	CR		84.00		27M0F8W			P	2
SYR	SYR22900	11.00	26	17806.98	38.30	34.90	1.04	0.90	7.00	MODRSS		44.73		MODTES	CL		84.00		27M0F8W			P	
TUN	TUN15000	-25.00	26	17806.98	9.50	33.50	1.88	0.72	135.00	MODRSS		43.13		MODTES	CL		84.00		27M0F8W			P	
AGL	AGL29500	-13.00	27	17826.16	16.50	-12.00	3.09	2.26	84.00	MODRSS		36.01		MODTES	CL		84.00		27M0F8W			P	
AUS	AUS00900	164.00	27	17826.16	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CR		87.00		27M0F8W		78	P	
AUS	AUS0090A	164.00	27	17826.16	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		78	P	4
AUS	AUS0090B	164.00	27	17826.16	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		78	P	4
BHR	BHR25500	17.00	27	17826.16	50.50	26.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
CVA	CVA08300	-37.00	27	17826.16	12.40	41.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
CZE	CZE14400	17.00	27	17826.16	15.50	49.79	0.92	0.60	174.55	MODRSS		47.02		MODTES	CR		84.00		27M0F8W			P	4
DNK	DNK09100	5.00	27	17826.16	-19.50	61.00	2.20	0.80	4.00	MODRSS		41.99		MODTES	CL		84.00		27M0F8W			P	
E	CNR13000	-30.00	27	17826.16	-15.70	28.40	1.54	0.60	5.00	MODRSS		44.79		MODTES	CR		84.00		27M0F8W		22	P	4, 7
E	HISPASA2	-30.00	27	17826.16	-8.80	35.40	3.00	1.90	45.00	MODRSS		36.90		MODTES	CR		84.00		27M0F8W	HISPASAT-2	22	A	4, 7
ERI	ERI09200	23.00	27	17826.16	39.41	14.98	1.67	0.95	145.48	MODRSS		42.44		MODTES	CL		84.00		27M0F8W			P	4
F	F2aA2773	-7.00	27	17826.16	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2773	-7.00	27	17826.16	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3373	-7.00	27	17826.16	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2773	-7.00	27	17826.16	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3373	-7.00	27	17826.16	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	27	17826.16	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	27	17826.16	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F /EUT	E2WA7DC1	29.00	27	17826.16	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	27	17826.16	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	27	17826.16	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	27	17826.16	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	27	17826.16	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
GHA	GHA10800	-25.00	27	17826.16	-1.20	7.90	1.48	1.06	102.00	MODRSS		42.49		MODTES	CR		83.00		27M0F8W			P	
GNE	GNE30300	-19.00	27	17826.16	10.30	1.50	0.68	0.60	10.00	MODRSS		48.34		MODTES	CR		84.00		27M0F8W			P	
HOL	HOL21300	-19.00	27	17826.16	5.40	52.00	0.76	0.60	171.00	MODRSS		47.86		MODTES	CL		84.00		27M0F8W			P	
JOR	JOR22400	11.00	27	17826.16	35.80	31.40	0.84	0.78	114.00	MODRSS		46.28		MODTES	CR		85.00		27M0F8W			P	
NOR	BIFROS21	-0.80	27	17826.16	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CR		84.00		27M0FXF	BIFROST-2		A	
RUS	RSTRSA11	36.00	27	17826.16	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	27	17826.16	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	27	17826.16	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	27	17826.16	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	27	17826.16	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	27	17826.16	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	27	17826.16	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	27	17826.16	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-5	42	P	
RUS	RUS00400	110.00	27	17826.16	118.22	51.52					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W			P	3, 4
SDN	SDN23000	-7.00	27	17826.16	29.90	9.80	2.95	2.17	123.00	MODRSS		36.38		MODTES	CL		86.00		27M0F8W			P	
SRL	SRL25900	-33.50	27	17826.16	-11.80	8.60	0.78	0.68	114.00	MODRSS		47.20		MODTES	CL		84.00		27M0F8W			P	4
TKM	TKM06800	44.00	27	17826.16	59.18	38.84	2.25	0.99	164.51	MODRSS		40.94		MODTES	CL		84.00		27M0F8W			P	4, 7
ZWE	ZWE13500	-1.00	27	17826.16	29.60	-18.80	1.46	1.36	37.00	MODRSS		41.47		MODTES	CR		85.00		27M0F8W			P	
ARM	ARM06400	23.00	28	17845.34	44.99	39.95	0.73	0.60	148.17	MODRSS		48.02		MODTES	CL		84.00		27M0F8W			P	4
AUS	AUS00600	152.00	28	17845.34	135.50	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CR		87.00		27M0F8W			P	
CAF	CAF25800	-13.00	28	17845.34	21.00	6.30	2.25	1.68	31.00	MODRSS		38.67		MODTES	CR		84.00		27M0F8W			P	
F	F2_A2788	-7.00	28	17845.34	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2784	-7.00	28	17845.34	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2788	-7.00	28	17845.34	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2784	-7.00	28	17845.34	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A2788	-7.00	28	17845.34	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3384	-7.00	28	17845.34	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_A3388	-7.00	28	17845.34	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2784	-7.00	28	17845.34	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D2788	-7.00	28	17845.34	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3384	-7.00	28	17845.34	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3388	-7.00	28	17845.34	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	MYT09800	29.00	28	17845.34	45.10	-12.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W		7	P	
F	MYT09801	29.00	28	17845.34	3.60	45.60	1.97	1.71	22.00	MODRSS		39.17		MODTES	CL		84.00		27M0F8W		7	P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F /EUT	E2WA7DA2	29.00	28	17845.34	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	28	17845.34	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	28	17845.34	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	28	17845.34	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	28	17845.34	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	28	17845.34	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	28	17845.34	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
I	I 08200	-19.00	28	17845.34	12.30	41.30	2.38	0.98	137.00	MODRSS		40.77		MODTES	CR		84.00		27M0F8W			P	
IRQ	IRQ25600	11.00	28	17845.34	43.50	33.00	2.28	1.32	145.00	MODRSS		39.66		MODTES	CL		84.00		27M0F8W			P	
KAZ	KAZ06600	44.00	28	17845.34	64.72	46.40	4.31	1.70	172.22	MODRSS		35.79		MODTES	CR		84.00		27M0F8W			P	4, 7
LSO	LSO30500	5.00	28	17845.34	27.80	-29.80	0.66	0.60	36.00	MODRSS		48.47		MODTES	CL		84.00		27M0F8W			P	
MTN	MTN28800	-37.00	28	17845.34	-7.80	23.40	1.63	1.10	141.00	MODRSS		41.91		MODTES	CL		86.00		27M0F8W			P	
MWI	MWI30800	-1.00	28	17845.34	34.10	-13.00	1.54	0.60	87.00	MODRSS		44.79		MODTES	CL		84.00		27M0F8W			P	
NGR	NGR11500	-25.00	28	17845.34	8.30	16.80	2.54	2.08	44.00	MODRSS		37.22		MODTES	CL		85.00		27M0F8W			P	
NOR	BIFROS22	-0.80	28	17845.34	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CL		84.00		27M0FXF	BIFROST-2		A	
NOR	NOR12101	5.00	28	17845.34	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W			P	
OMA	OMA12300	17.00	28	17845.34	55.60	21.00	1.88	1.02	100.00	MODRSS		41.62		MODTES	CR		85.00		27M0F8W			P	
POR	AZR13400	-30.00	28	17845.34	-23.40	36.10	2.56	0.70	158.00	MODRSS		41.91		MODTES	CL		84.00		27M0F8W			P	7
RUS	RSTRSA12	36.00	28	17845.34	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	28	17845.34	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	28	17845.34	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	28	17845.34	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	28	17845.34	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	28	17845.34	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	28	17845.34	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	28	17845.34	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-5	42	P	
SDN	SDN23200	-7.00	28	17845.34	29.60	18.40	2.54	2.09	167.00	MODRSS		37.20		MODTES	CR		86.00		27M0F8W			P	
ALB	ALB29600	-7.00	29	17864.52	20.10	41.00	1.17	0.65	128.00	MODRSS		45.64		MODTES	CL		84.00		27M0F8W			P	
AUS	AUS00900	164.00	29	17864.52	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CR		87.00		27M0F8W		78	P	
AUS	AUS0090A	164.00	29	17864.52	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		78	P	4
AUS	AUS0090B	164.00	29	17864.52	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		78	P	4
BEL	BEL01800	-19.00	29	17864.52	4.60	50.60	0.82	0.60	167.00	MODRSS		47.53		MODTES	CL		84.00		27M0F8W			P	
BFA	BFA10700	-30.00	29	17864.52	-1.50	12.20	1.45	1.14	29.00	MODRSS		42.26		MODTES	CL		84.00		27M0F8W			P	4, 7
CYP	CYP08600	5.00	29	17864.52	33.30	35.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
D	D2-21600	-1.00	29	17864.52	12.60	52.10	0.83	0.63	172.00	MODRSS		47.26		MODTES	CR		84.00		27M0F8W			P	4, 7
DJI	DJI09900	23.00	29	17864.52	42.50	11.60	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
E	HISPASA2	-30.00	29	17864.52	-8.80	35.40	3.00	1.90	45.00	MODRSS		36.90		MODTES	CR		84.00		27M0F8W	HISPASAT-2	22	A	4, 7
F	F 09306	-7.00	29	17864.52	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		27M0F8W	RADIOSAT	19	A	
F	F3_A2751	-7.00	29	17864.52	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		27M0F9W	RADIOSAT-3	19	A	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F	F3_A3351	-7.00	29	17864.52	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2751	-7.00	29	17864.52	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3351	-7.00	29	17864.52	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	29	17864.52	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	29	17864.52	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	29	17864.52	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	29	17864.52	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	29	17864.52	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	29	17864.52	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	29	17864.52	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
ISL	ISL04900	-33.50	29	17864.52	-19.00	64.90	1.00	0.60	177.00	MODRSS		46.67		MODTES	CR		82.00		27M0F8W			P	
KEN	KEN24900	11.00	29	17864.52	37.90	1.10	2.29	1.56	94.00	MODRSS		38.92		MODTES	CL		84.00		27M0F8W			P	
LVA	LVA06100	23.00	29	17864.52	24.53	56.20	0.83	0.60	0.05	MODRSS		47.50		MODTES	CR		84.00		27M0F8W			P	4
MCO	MCO11600	-37.00	29	17864.52	7.40	43.70	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		83.00		27M0F8W			P	
MNG	MNG24800	74.00	29	17864.52	107.50	47.80	2.00	2.00	0.00	MODRSS		38.43		MODTES	CR		89.02		27M0F8W			P	
RUS	RSTRSA11	36.00	29	17864.52	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	29	17864.52	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	29	17864.52	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	29	17864.52	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	29	17864.52	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	29	17864.52	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	29	17864.52	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	29	17864.52	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-5	42	P	
SEN	SEN22200	-37.00	29	17864.52	-14.40	13.80	1.46	1.04	139.00	MODRSS		42.63		MODTES	CR		85.00		27M0F8W			P	
TON	TON21500	170.00	29	17864.52	-174.70	-18.00	1.41	0.68	85.00	MODRSS		44.63		MODTES	CR		84.00		27M0F8W			P	
UAE	UAE27400	17.00	29	17864.52	53.60	24.40	0.98	0.80	162.00	MODRSS		45.50		MODTES	CL		84.00		27M0F8W			P	
USA	GUM33100	122.00	29	17864.52	151.10	11.60	6.48	3.49	179.00	MODRSS		30.90		MODTES	CR		87.00		27M0F8W		15	P	
USA	GUM33101	122.00	29	17864.52	-157.50	21.00	2.02	0.60	115.00	MODRSS		43.61		MODTES	CR		87.00		27M0F8W		15	P	
AUS	AUS00600	152.00	30	17883.70	135.50	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CR		87.00		27M0F8W			P	
BDI	BDI27000	11.00	30	17883.70	29.90	-3.10	0.71	0.60	80.00	MODRSS		48.15		MODTES	CR		84.00		27M0F8W			P	
COG	COG23500	-13.00	30	17883.70	14.60	-0.70	2.02	1.18	59.00	MODRSS		40.67		MODTES	CR		84.00		27M0F8W			P	
CTI	CTI23700	-30.00	30	17883.70	-5.80	7.40	1.55	1.43	162.00	MODRSS		40.99		MODTES	CR		84.00		27M0F8W			P	4
F	F2aA2762	-7.00	30	17883.70	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2762	-7.00	30	17883.70	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3362	-7.00	30	17883.70	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2762	-7.00	30	17883.70	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3362	-7.00	30	17883.70	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	REU09700	29.00	30	17883.70	55.60	-19.20	1.56	0.78	96.00	MODRSS		43.59		MODTES	CL		84.00		27M0F8W		5	P	
F	REU09701	29.00	30	17883.70	3.70	45.20	1.94	1.68	24.00	MODRSS		39.32		MODTES	CL		84.00		27M0F8W		5	P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F /EUT	E2WA7DA2	29.00	30	17883.70	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	30	17883.70	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	30	17883.70	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	30	17883.70	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	30	17883.70	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	30	17883.70	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	30	17883.70	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
G	G UKDBS	-33.50	30	17883.70	-3.50	53.80	1.84	0.72	142.00	MODRSS		43.20		MODTES	CL		84.00		27M0F8W	UKDBS-3		A	4
GEO	GEO06400	23.00	30	17883.70	43.35	42.27	1.11	0.60	161.21	MODRSS		46.23		MODTES	CL		84.00		27M0F8W			P	4
HNG	HNG10600	-1.00	30	17883.70	22.20	45.60	2.00	2.00	0.00	MODRSS		38.43		MODTES	CL		84.00		27M0F8W			P	
KGZ	KGZ07000	44.00	30	17883.70	73.88	41.32	1.34	0.64	3.53	MODRSS		45.12		MODTES	CR		84.00		27M0F8W			P	4, 7
KWT	KWT11300	17.00	30	17883.70	47.60	29.20	0.68	0.60	145.00	MODRSS		48.34		MODTES	CR		84.00		27M0F8W			P	
MTN	MTN22300	-37.00	30	17883.70	-12.20	18.50	2.62	1.87	150.00	MODRSS		37.55		MODTES	CL		86.00		27M0F8W			P	
RUS	RSTRSA12	36.00	30	17883.70	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	30	17883.70	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	30	17883.70	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	30	17883.70	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	30	17883.70	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	30	17883.70	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	30	17883.70	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	30	17883.70	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-5	42	P	
S	S 13900	5.00	30	17883.70	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W			P	
SDN	SDN23100	-7.00	30	17883.70	29.90	12.90	2.64	2.08	155.00	MODRSS		37.05		MODTES	CR		86.00		27M0F8W			P	
SUI	SUI14000	-19.00	30	17883.70	8.20	46.60	0.98	0.70	171.00	MODRSS		46.08		MODTES	CR		84.00		27M0F8W			P	2
SYR	SYR22900	11.00	30	17883.70	38.30	34.90	1.04	0.90	7.00	MODRSS		44.73		MODTES	CL		84.00		27M0F8W			P	
TUN	TUN15000	-25.00	30	17883.70	9.50	33.50	1.88	0.72	135.00	MODRSS		43.13		MODTES	CL		84.00		27M0F8W			P	
AGL	AGL29500	-13.00	31	17902.88	16.50	-12.00	3.09	2.26	84.00	MODRSS		36.01		MODTES	CL		84.00		27M0F8W			P	
AUS	AUS00900	164.00	31	17902.88	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CR		87.00		27M0F8W		78	P	
AUS	AUS0090A	164.00	31	17902.88	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		78	P	4
AUS	AUS0090B	164.00	31	17902.88	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		78	P	4
BHR	BHR25500	17.00	31	17902.88	50.50	26.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
CVA	CVA08300	-37.00	31	17902.88	12.40	41.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
CZE	CZE14400	17.00	31	17902.88	15.50	49.79	0.92	0.60	174.55	MODRSS		47.02		MODTES	CR		84.00		27M0F8W			P	4
E	CNR13000	-30.00	31	17902.88	-15.70	28.40	1.54	0.60	5.00	MODRSS		44.79		MODTES	CR		84.00		27M0F8W		22	P	4
E	HISPASA2	-30.00	31	17902.88	-8.80	35.40	3.00	1.90	45.00	MODRSS		36.90		MODTES	CR		84.00		27M0F8W	HISPASAT-2	22	A	4
ERI	ERI09200	23.00	31	17902.88	39.41	14.98	1.67	0.95	145.48	MODRSS		42.44		MODTES	CL		84.00		27M0F8W			P	4
F	F2aA2773	-7.00	31	17902.88	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2773	-7.00	31	17902.88	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3373	-7.00	31	17902.88	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F	F3_D2773	-7.00	31	17902.88	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3373	-7.00	31	17902.88	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	31	17902.88	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	31	17902.88	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	31	17902.88	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	31	17902.88	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	31	17902.88	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	31	17902.88	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	31	17902.88	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
GHA	GHA10800	-25.00	31	17902.88	-1.20	7.90	1.48	1.06	102.00	MODRSS		42.49		MODTES	CR		83.00		27M0F8W			P	
GNE	GNE30300	-19.00	31	17902.88	10.30	1.50	0.68	0.60	10.00	MODRSS		48.34		MODTES	CR		84.00		27M0F8W			P	
HOL	HOL21300	-19.00	31	17902.88	5.40	52.00	0.76	0.60	171.00	MODRSS		47.86		MODTES	CL		84.00		27M0F8W			P	
ISL	ISL05000	5.00	31	17902.88	-19.50	61.00	2.20	0.80	4.00	MODRSS		41.99		MODTES	CL		84.00		27M0F8W			P	
JOR	JOR22400	11.00	31	17902.88	35.80	31.40	0.84	0.78	114.00	MODRSS		46.28		MODTES	CR		85.00		27M0F8W			P	
NOR	BIFROS21	-0.80	31	17902.88	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CR		84.00		27M0FXF	BIFROST-2		A	
RUS	RSTRSA11	36.00	31	17902.88	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	31	17902.88	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	31	17902.88	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	31	17902.88	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	31	17902.88	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	31	17902.88	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	31	17902.88	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	31	17902.88	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-5	42	P	
RUS	RUS00400	110.00	31	17902.88	118.22	51.52					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W			P	3, 4
SDN	SDN23000	-7.00	31	17902.88	29.90	9.80	2.95	2.17	123.00	MODRSS		36.38		MODTES	CL		86.00		27M0F8W			P	
SRL	SRL25900	-33.50	31	17902.88	-11.80	8.60	0.78	0.68	114.00	MODRSS		47.20		MODTES	CL		84.00		27M0F8W			P	4
TKM	TKM06800	44.00	31	17902.88	59.18	38.84	2.25	0.99	164.51	MODRSS		40.94		MODTES	CL		84.00		27M0F8W			P	4, 7
ZWE	ZWE13500	-1.00	31	17902.88	29.60	-18.80	1.46	1.36	37.00	MODRSS		41.47		MODTES	CR		85.00		27M0F8W			P	
ARM	ARM06400	23.00	32	17922.06	44.99	39.95	0.73	0.60	148.17	MODRSS		48.02		MODTES	CL		84.00		27M0F8W			P	4
AUS	AUS00600	152.00	32	17922.06	135.50	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CR		87.00		27M0F8W			P	
CAF	CAF25800	-13.00	32	17922.06	21.00	6.30	2.25	1.68	31.00	MODRSS		38.67		MODTES	CR		84.00		27M0F8W			P	
F	F2_A2788	-7.00	32	17922.06	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2784	-7.00	32	17922.06	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2788	-7.00	32	17922.06	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2784	-7.00	32	17922.06	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A2788	-7.00	32	17922.06	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3384	-7.00	32	17922.06	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_A3388	-7.00	32	17922.06	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2784	-7.00	32	17922.06	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F	F3_D2788	-7.00	32	17922.06	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3384	-7.00	32	17922.06	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3388	-7.00	32	17922.06	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	MYT09800	29.00	32	17922.06	45.10	-12.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W		7	P	
F	MYT09801	29.00	32	17922.06	3.60	45.60	1.97	1.71	22.00	MODRSS		39.17		MODTES	CL		84.00		27M0F8W		7	P	
F /EUT	E2WA7DA2	29.00	32	17922.06	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	32	17922.06	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	32	17922.06	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	32	17922.06	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	32	17922.06	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	32	17922.06	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	32	17922.06	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
I	I 08200	-19.00	32	17922.06	12.30	41.30	2.38	0.98	137.00	MODRSS		40.77		MODTES	CR		84.00		27M0F8W			P	
IRQ	IRQ25600	11.00	32	17922.06	43.50	33.00	2.28	1.32	145.00	MODRSS		39.66		MODTES	CL		84.00		27M0F8W			P	
KAZ	KAZ06600	44.00	32	17922.06	64.72	46.40	4.31	1.70	172.22	MODRSS		35.79		MODTES	CR		84.00		27M0F8W			P	4, 7
LSO	LSO30500	5.00	32	17922.06	27.80	-29.80	0.66	0.60	36.00	MODRSS		48.47		MODTES	CL		84.00		27M0F8W			P	
MTN	MTN28800	-37.00	32	17922.06	-7.80	23.40	1.63	1.10	141.00	MODRSS		41.91		MODTES	CL		86.00		27M0F8W			P	
MWI	MWI30800	-1.00	32	17922.06	34.10	-13.00	1.54	0.60	87.00	MODRSS		44.79		MODTES	CL		84.00		27M0F8W			P	
NGR	NGR11500	-25.00	32	17922.06	8.30	16.80	2.54	2.08	44.00	MODRSS		37.22		MODTES	CL		85.00		27M0F8W			P	
NOR	BIFROS22	-0.80	32	17922.06	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CL		84.00		27M0FXF	BIFROST-2		A	
NOR	NOR12102	5.00	32	17922.06	17.00	61.50	2.00	1.00	10.00	R13RSS		41.44		R13TES	CR		84.00		27M0F8W			PE	
OMA	OMA12300	17.00	32	17922.06	55.60	21.00	1.88	1.02	100.00	MODRSS		41.62		MODTES	CR		85.00		27M0F8W			P	
POR	AZR13400	-30.00	32	17922.06	-23.40	36.10	2.56	0.70	158.00	MODRSS		41.91		MODTES	CL		84.00		27M0F8W			P	
RUS	RSTRSA12	36.00	32	17922.06	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	32	17922.06	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	32	17922.06	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	32	17922.06	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	32	17922.06	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	32	17922.06	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	32	17922.06	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	32	17922.06	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-5	42	P	
SDN	SDN23200	-7.00	32	17922.06	29.60	18.40	2.54	2.09	167.00	MODRSS		37.20		MODTES	CR		86.00		27M0F8W			P	
ALB	ALB29600	-7.00	33	17941.24	20.10	41.00	1.17	0.65	128.00	MODRSS		45.64		MODTES	CL		84.00		27M0F8W			P	
BEL	BEL01800	-19.00	33	17941.24	4.60	50.60	0.82	0.60	167.00	MODRSS		47.53		MODTES	CL		84.00		27M0F8W			P	
BFA	BFA10700	-30.00	33	17941.24	-1.50	12.20	1.45	1.14	29.00	MODRSS		42.26		MODTES	CL		84.00		27M0F8W			P	4
CYP	CYP08600	5.00	33	17941.24	33.30	35.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
D	D2-21600	-1.00	33	17941.24	12.60	52.10	0.83	0.63	172.00	MODRSS		47.26		MODTES	CR		84.00		27M0F8W			P	4, 7
DJI	DJI09900	23.00	33	17941.24	42.50	11.60	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
E	HISPASA2	-30.00	33	17941.24	-8.80	35.40	3.00	1.90	45.00	MODRSS		36.90		MODTES	CR		84.00		27M0F8W	HISPASAT-2	22	A	4

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F	F 09306	-7.00	33	17941.24	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		27M0F8W	RADIOSAT	19	A	
F	F3_A2751	-7.00	33	17941.24	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3351	-7.00	33	17941.24	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2751	-7.00	33	17941.24	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3351	-7.00	33	17941.24	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	33	17941.24	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	33	17941.24	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	33	17941.24	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	33	17941.24	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	33	17941.24	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	33	17941.24	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	33	17941.24	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
ISL	ISL04900	-33.50	33	17941.24	-19.00	64.90	1.00	0.60	177.00	MODRSS		46.67		MODTES	CR		82.00		27M0F8W			P	
KEN	KEN24900	11.00	33	17941.24	37.90	1.10	2.29	1.56	94.00	MODRSS		38.92		MODTES	CL		84.00		27M0F8W			P	
LVA	LVA06100	23.00	33	17941.24	24.53	56.20	0.83	0.60	0.05	MODRSS		47.50		MODTES	CR		84.00		27M0F8W			P	4
MCO	MCO11600	-37.00	33	17941.24	7.40	43.70	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		83.00		27M0F8W			P	
MNG	MNG24800	74.00	33	17941.24	107.50	47.80	2.00	2.00	0.00	MODRSS		38.43		MODTES	CR		89.02		27M0F8W			P	
RUS	RSTRSA11	36.00	33	17941.24	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	33	17941.24	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	33	17941.24	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	33	17941.24	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	33	17941.24	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	33	17941.24	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	33	17941.24	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	33	17941.24	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-5	42	P	
SEN	SEN22200	-37.00	33	17941.24	-14.40	13.80	1.46	1.04	139.00	MODRSS		42.63		MODTES	CR		85.00		27M0F8W			P	
TON	TON21500	170.00	33	17941.24	-174.70	-18.00	1.41	0.68	85.00	MODRSS		44.63		MODTES	CR		84.00		27M0F8W			P	
UAE	UAE27400	17.00	33	17941.24	53.60	24.40	0.98	0.80	162.00	MODRSS		45.50		MODTES	CL		84.00		27M0F8W			P	
USA	GUM33100	122.00	33	17941.24	151.10	11.60	6.48	3.49	179.00	MODRSS		30.90		MODTES	CR		87.00		27M0F8W		15	P	
USA	GUM33101	122.00	33	17941.24	-157.50	21.00	2.02	0.60	115.00	MODRSS		43.61		MODTES	CR		87.00		27M0F8W		15	P	
BDI	BDI27000	11.00	34	17960.42	29.90	-3.10	0.71	0.60	80.00	MODRSS		48.15		MODTES	CR		84.00		27M0F8W			P	
COG	COG23500	-13.00	34	17960.42	14.60	-0.70	2.02	1.18	59.00	MODRSS		40.67		MODTES	CR		84.00		27M0F8W			P	
CTI	CTI23700	-30.00	34	17960.42	-5.80	7.40	1.55	1.43	162.00	MODRSS		40.99		MODTES	CR		84.00		27M0F8W			P	4
F	F2aA2762	-7.00	34	17960.42	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2762	-7.00	34	17960.42	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3362	-7.00	34	17960.42	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2762	-7.00	34	17960.42	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3362	-7.00	34	17960.42	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	REU09700	29.00	34	17960.42	55.60	-19.20	1.56	0.78	96.00	MODRSS		43.59		MODTES	CL		84.00		27M0F8W		5	P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F	REU09701	29.00	34	17960.42	3.70	45.20	1.94	1.68	24.00	MODRSS		39.32		MODTES	CL		84.00		27M0F8W		5	P	
F /EUT	E2WA7DA2	29.00	34	17960.42	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	34	17960.42	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	34	17960.42	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	34	17960.42	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	34	17960.42	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	34	17960.42	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	34	17960.42	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
G	G UKDBS	-33.50	34	17960.42	-3.50	53.80	1.84	0.72	142.00	MODRSS		43.20		MODTES	CL		84.00		27M0F8W	UKDBS-3		A	4
GEO	GEO06400	23.00	34	17960.42	43.35	42.27	1.11	0.60	161.21	MODRSS		46.23		MODTES	CL		84.00		27M0F8W			P	4
HNG	HNG10600	-1.00	34	17960.42	22.20	45.60	2.00	2.00	0.00	MODRSS		38.43		MODTES	CL		84.00		27M0F8W			P	
KGZ	KGZ07000	44.00	34	17960.42	73.88	41.32	1.34	0.64	3.53	MODRSS		45.12		MODTES	CR		84.00		27M0F8W			P	4, 7
KWT	KWT11300	17.00	34	17960.42	47.60	29.20	0.68	0.60	145.00	MODRSS		48.34		MODTES	CR		84.00		27M0F8W			P	
MTN	MTN22300	-37.00	34	17960.42	-12.20	18.50	2.62	1.87	150.00	MODRSS		37.55		MODTES	CL		86.00		27M0F8W			P	
RUS	RSTRSA12	36.00	34	17960.42	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	34	17960.42	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	34	17960.42	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	34	17960.42	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	34	17960.42	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	34	17960.42	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	34	17960.42	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	34	17960.42	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-5	42	P	
S	S 13800	5.00	34	17960.42	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W		27	P	
SDN	SDN23100	-7.00	34	17960.42	29.90	12.90	2.64	2.08	155.00	MODRSS		37.05		MODTES	CR		86.00		27M0F8W			P	
SUI	SUI14000	-19.00	34	17960.42	8.20	46.60	0.98	0.70	171.00	MODRSS		46.08		MODTES	CR		84.00		27M0F8W			P	2
SYR	SYR22900	11.00	34	17960.42	38.30	34.90	1.04	0.90	7.00	MODRSS		44.73		MODTES	CL		84.00		27M0F8W			P	
TUN	TUN15000	-25.00	34	17960.42	9.50	33.50	1.88	0.72	135.00	MODRSS		43.13		MODTES	CL		84.00		27M0F8W			P	
AGL	AGL29500	-13.00	35	17979.60	16.50	-12.00	3.09	2.26	84.00	MODRSS		36.01		MODTES	CL		84.00		27M0F8W			P	
AUS	AUS00900	164.00	35	17979.60	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CR		87.00		27M0F8W		78	P	
AUS	AUS0090A	164.00	35	17979.60	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		78	P	4
AUS	AUS0090B	164.00	35	17979.60	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		78	P	4
BHR	BHR25500	17.00	35	17979.60	50.50	26.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
CVA	CVA08300	-37.00	35	17979.60	12.40	41.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
CZE	CZE14400	17.00	35	17979.60	15.50	49.79	0.92	0.60	174.55	MODRSS		47.02		MODTES	CR		84.00		27M0F8W			P	4
DNK	DNK09100	5.00	35	17979.60	-19.50	61.00	2.20	0.80	4.00	MODRSS		41.99		MODTES	CL		84.00		27M0F8W			P	
E	CNR13000	-30.00	35	17979.60	-15.70	28.40	1.54	0.60	5.00	MODRSS		44.79		MODTES	CR		84.00		27M0F8W		22	P	4
E	HISPASA2	-30.00	35	17979.60	-8.80	35.40	3.00	1.90	45.00	MODRSS		36.90		MODTES	CR		84.00		27M0F8W	HISPASAT-2	22	A	4
ERI	ERI09200	23.00	35	17979.60	39.41	14.98	1.67	0.95	145.48	MODRSS		42.44		MODTES	CL		84.00		27M0F8W			P	4
F	F2aA2773	-7.00	35	17979.60	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F	F3_A2773	-7.00	35	17979.60	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3373	-7.00	35	17979.60	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2773	-7.00	35	17979.60	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3373	-7.00	35	17979.60	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	35	17979.60	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	35	17979.60	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	35	17979.60	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	35	17979.60	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	35	17979.60	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	35	17979.60	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	35	17979.60	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
GHA	GHA10800	-25.00	35	17979.60	-1.20	7.90	1.48	1.06	102.00	MODRSS		42.49		MODTES	CR		83.00		27M0F8W			P	
GNE	GNE30300	-19.00	35	17979.60	10.30	1.50	0.68	0.60	10.00	MODRSS		48.34		MODTES	CR		84.00		27M0F8W			P	
HOL	HOL21300	-19.00	35	17979.60	5.40	52.00	0.76	0.60	171.00	MODRSS		47.86		MODTES	CL		84.00		27M0F8W			P	
JOR	JOR22400	11.00	35	17979.60	35.80	31.40	0.84	0.78	114.00	MODRSS		46.28		MODTES	CR		85.00		27M0F8W			P	
NOR	BIFROS21	-0.80	35	17979.60	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CR		84.00		27M0FXF	BIFROST-2		A	
RUS	RSTRSA11	36.00	35	17979.60	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	35	17979.60	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	35	17979.60	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	35	17979.60	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	35	17979.60	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	35	17979.60	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	35	17979.60	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	35	17979.60	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-5	42	P	
RUS	RUS00400	110.00	35	17979.60	118.22	51.52					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W			P	3, 4
SDN	SDN23000	-7.00	35	17979.60	29.90	9.80	2.95	2.17	123.00	MODRSS		36.38		MODTES	CL		86.00		27M0F8W			P	
SRL	SRL25900	-33.50	35	17979.60	-11.80	8.60	0.78	0.68	114.00	MODRSS		47.20		MODTES	CL		84.00		27M0F8W			P	4
TKM	TKM06800	44.00	35	17979.60	59.18	38.84	2.25	0.99	164.51	MODRSS		40.94		MODTES	CL		84.00		27M0F8W			P	4, 7
ZWE	ZWE13500	-1.00	35	17979.60	29.60	-18.80	1.46	1.36	37.00	MODRSS		41.47		MODTES	CR		85.00		27M0F8W			P	
ARM	ARM06400	23.00	36	17998.78	44.99	39.95	0.73	0.60	148.17	MODRSS		48.02		MODTES	CL		84.00		27M0F8W			P	4
AUS	AUS00600	152.00	36	17998.78	135.50	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CR		87.00		27M0F8W			P	
CAF	CAF25800	-13.00	36	17998.78	21.00	6.30	2.25	1.68	31.00	MODRSS		38.67		MODTES	CR		84.00		27M0F8W			P	
DNK	DNK09000	5.00	36	17998.78	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W			P	
F	F2_A2788	-7.00	36	17998.78	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2784	-7.00	36	17998.78	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2788	-7.00	36	17998.78	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2784	-7.00	36	17998.78	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A2788	-7.00	36	17998.78	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3384	-7.00	36	17998.78	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F	F3_A3388	-7.00	36	17998.78	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2784	-7.00	36	17998.78	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D2788	-7.00	36	17998.78	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3384	-7.00	36	17998.78	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3388	-7.00	36	17998.78	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	MYT09800	29.00	36	17998.78	45.10	-12.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W		7	P	
F	MYT09801	29.00	36	17998.78	3.60	45.60	1.97	1.71	22.00	MODRSS		39.17		MODTES	CL		84.00		27M0F8W		7	P	
F /EUT	E2WA7DA2	29.00	36	17998.78	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	36	17998.78	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	36	17998.78	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	36	17998.78	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	36	17998.78	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	36	17998.78	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	36	17998.78	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
I	I 08200	-19.00	36	17998.78	12.30	41.30	2.38	0.98	137.00	MODRSS		40.77		MODTES	CR		84.00		27M0F8W			P	
IRQ	IRQ25600	11.00	36	17998.78	43.50	33.00	2.28	1.32	145.00	MODRSS		39.66		MODTES	CL		84.00		27M0F8W			P	
KAZ	KAZ06600	44.00	36	17998.78	64.72	46.40	4.31	1.70	172.22	MODRSS		35.79		MODTES	CR		84.00		27M0F8W			P	4, 7
LSO	LSO30500	5.00	36	17998.78	27.80	-29.80	0.66	0.60	36.00	MODRSS		48.47		MODTES	CL		84.00		27M0F8W			P	
MTN	MTN28800	-37.00	36	17998.78	-7.80	23.40	1.63	1.10	141.00	MODRSS		41.91		MODTES	CL		86.00		27M0F8W			P	
MWI	MWI30800	-1.00	36	17998.78	34.10	-13.00	1.54	0.60	87.00	MODRSS		44.79		MODTES	CL		84.00		27M0F8W			P	
NGR	NGR11500	-25.00	36	17998.78	8.30	16.80	2.54	2.08	44.00	MODRSS		37.22		MODTES	CL		85.00		27M0F8W			P	
NOR	BIFROS22	-0.80	36	17998.78	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CL		84.00		27M0FXF	BIFROST-2		A	
OMA	OMA12300	17.00	36	17998.78	55.60	21.00	1.88	1.02	100.00	MODRSS		41.62		MODTES	CR		85.00		27M0F8W			P	
POR	AZR13400	-30.00	36	17998.78	-23.40	36.10	2.56	0.70	158.00	MODRSS		41.91		MODTES	CL		84.00		27M0F8W			P	7
RUS	RSTRSA12	36.00	36	17998.78	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	36	17998.78	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	36	17998.78	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	36	17998.78	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	36	17998.78	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	36	17998.78	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	36	17998.78	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	36	17998.78	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-5	42	P	
SDN	SDN23200	-7.00	36	17998.78	29.60	18.40	2.54	2.09	167.00	MODRSS		37.20		MODTES	CR		86.00		27M0F8W			P	
ALB	ALB29600	-7.00	37	18017.96	20.10	41.00	1.17	0.65	128.00	MODRSS		45.64		MODTES	CL		84.00		27M0F8W			P	
BEL	BEL01800	-19.00	37	18017.96	4.60	50.60	0.82	0.60	167.00	MODRSS		47.53		MODTES	CL		84.00		27M0F8W			P	
BFA	BFA10700	-30.00	37	18017.96	-1.50	12.20	1.45	1.14	29.00	MODRSS		42.26		MODTES	CL		84.00		27M0F8W			P	4, 7
CYP	CYP08600	5.00	37	18017.96	33.30	35.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
D	D2-21600	-1.00	37	18017.96	12.60	52.10	0.83	0.63	172.00	MODRSS		47.26		MODTES	CR		84.00		27M0F8W			P	4, 7
DJI	DJI09900	23.00	37	18017.96	42.50	11.60	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
E	HISPASA2	-30.00	37	18017.96	-8.80	35.40	3.00	1.90	45.00	MODRSS		36.90		MODTES	CR		84.00		27M0F8W	HISPASAT-2	22	A	4, 7
F	F 09306	-7.00	37	18017.96	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		27M0F8W	RADIOSAT	19	A	
F	F3_A2751	-7.00	37	18017.96	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3351	-7.00	37	18017.96	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2751	-7.00	37	18017.96	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3351	-7.00	37	18017.96	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		77.30		33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	37	18017.96	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	37	18017.96	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	37	18017.96	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	37	18017.96	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	37	18017.96	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	37	18017.96	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	37	18017.96	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
ISL	ISL04900	-33.50	37	18017.96	-19.00	64.90	1.00	0.60	177.00	MODRSS		46.67		MODTES	CR		82.00		27M0F8W			P	
KEN	KEN24900	11.00	37	18017.96	37.90	1.10	2.29	1.56	94.00	MODRSS		38.92		MODTES	CL		84.00		27M0F8W			P	
LVA	LVA06100	23.00	37	18017.96	24.53	56.20	0.83	0.60	0.05	MODRSS		47.50		MODTES	CR		84.00		27M0F8W			P	4
MCO	MCO11600	-37.00	37	18017.96	7.40	43.70	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		83.00		27M0F8W			P	
MNG	MNG24800	74.00	37	18017.96	107.50	47.80	2.00	2.00	0.00	MODRSS		38.43		MODTES	CR		89.02		27M0F8W			P	
RUS	RSTRSA11	36.00	37	18017.96	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	37	18017.96	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	37	18017.96	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	37	18017.96	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	37	18017.96	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	37	18017.96	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	37	18017.96	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	37	18017.96	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-5	42	P	
SEN	SEN22200	-37.00	37	18017.96	-14.40	13.80	1.46	1.04	139.00	MODRSS		42.63		MODTES	CR		85.00		27M0F8W			P	
UAE	UAE27400	17.00	37	18017.96	53.60	24.40	0.98	0.80	162.00	MODRSS		45.50		MODTES	CL		84.00		27M0F8W			P	
USA	GUM33100	122.00	37	18017.96	151.10	11.60	6.48	3.49	179.00	MODRSS		30.90		MODTES	CR		87.00		27M0F8W		15	P	
USA	GUM33101	122.00	37	18017.96	-157.50	21.00	2.02	0.60	115.00	MODRSS		43.61		MODTES	CR		87.00		27M0F8W		15	P	
BDI	BDI27000	11.00	38	18037.14	29.90	-3.10	0.71	0.60	80.00	MODRSS		48.15		MODTES	CR		84.00		27M0F8W			P	
COG	COG23500	-13.00	38	18037.14	14.60	-0.70	2.02	1.18	59.00	MODRSS		40.67		MODTES	CR		84.00		27M0F8W			P	
CTI	CTI23700	-30.00	38	18037.14	-5.80	7.40	1.55	1.43	162.00	MODRSS		40.99		MODTES	CR		84.00		27M0F8W			P	4, 7
F	F2aA2762	-7.00	38	18037.14	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2762	-7.00	38	18037.14	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3362	-7.00	38	18037.14	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2762	-7.00	38	18037.14	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3362	-7.00	38	18037.14	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	REU09700	29.00	38	18037.14	55.60	-19.20	1.56	0.78	96.00	MODRSS		43.59		MODTES	CL		84.00		27M0F8W		5	P	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight Long.°	Boresight Lat.°	Space Antenna Character. Major°	Minor°	Orient.°	Space Antenna	Shap. Beam	Space Ant. Gain Co-pol.	X-pol.	Earth Antenna	Polarization Typ.	Angle	EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
F	REU09701	29.00	38	18037.14	3.70	45.20	1.94	1.68	24.00	MODRSS		39.32		MODTES	CL		84.00		27M0F8W		5	P	
F /EUT	E2WA7DA2	29.00	38	18037.14	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	38	18037.14	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	38	18037.14	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	38	18037.14	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	38	18037.14	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	38	18037.14	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	38	18037.14	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
G	G UKDBS	-33.50	38	18037.14	-3.50	53.80	1.84	0.72	142.00	MODRSS		43.20		MODTES	CL		84.00		27M0F8W	UKDBS-3		A	4
GEO	GEO06400	23.00	38	18037.14	43.35	42.27	1.11	0.60	161.21	MODRSS		46.23		MODTES	CL		84.00		27M0F8W			P	4
HNG	HNG10600	-1.00	38	18037.14	22.20	45.60	2.00	2.00	0.00	MODRSS		38.43		MODTES	CL		84.00		27M0F8W			P	
KGZ	KGZ07000	44.00	38	18037.14	73.88	41.32	1.34	0.64	3.53	MODRSS		45.12		MODTES	CR		84.00		27M0F8W			P	4, 7
KWT	KWT11300	17.00	38	18037.14	47.60	29.20	0.68	0.60	145.00	MODRSS		48.34		MODTES	CR		84.00		27M0F8W			P	
MTN	MTN22300	-37.00	38	18037.14	-12.20	18.50	2.62	1.87	150.00	MODRSS		37.55		MODTES	CL		86.00		27M0F8W			P	
NOR	NOR12000	5.00	38	18037.14	17.00	61.50	2.00	1.00	10.00	MODRSS		41.44		MODTES	CR		84.00		27M0F8W			P	
RUS	RSTRSA12	36.00	38	18037.14	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	38	18037.14	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	38	18037.14	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	38	18037.14	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	38	18037.14	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	38	18037.14	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	38	18037.14	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	38	18037.14	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-5	42	P	
SDN	SDN23100	-7.00	38	18037.14	29.90	12.90	2.64	2.08	155.00	MODRSS		37.05		MODTES	CR		86.00		27M0F8W			P	
SUI	SUI14000	-19.00	38	18037.14	8.20	46.60	0.98	0.70	171.00	MODRSS		46.08		MODTES	CR		84.00		27M0F8W			P	2
SYR	SYR33900	11.00	38	18037.14	37.60	34.20	1.32	0.88	74.00	MODRSS		43.80		MODTES	CL		84.00		27M0F8W			P	
TUN	TUN27200	-25.00	38	18037.14	2.50	32.00	3.59	1.75	175.00	MODRSS		36.47		MODTES	CL		84.00		27M0F8W			P	
AGL	AGL29500	-13.00	39	18056.32	16.50	-12.00	3.09	2.26	84.00	MODRSS		36.01		MODTES	CL		84.00		27M0F8W			P	
AUS	AUS00900	164.00	39	18056.32	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	CR		87.00		27M0F8W		78	P	
AUS	AUS0090A	164.00	39	18056.32	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		78	P	4
AUS	AUS0090B	164.00	39	18056.32	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	CR		87.00		27M0F8W		78	P	4
BHR	BHR25500	17.00	39	18056.32	50.50	26.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W			P	
CVA	CVA08300	-37.00	39	18056.32	12.40	41.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CR		84.00		27M0F8W			P	
CZE	CZE14400	17.00	39	18056.32	15.50	49.79	0.92	0.60	174.55	MODRSS		47.02		MODTES	CR		84.00		27M0F8W			P	4
E	CNR13000	-30.00	39	18056.32	-15.70	28.40	1.54	0.60	5.00	MODRSS		44.79		MODTES	CR		84.00		27M0F8W		22	P	4, 7
E	HISPASA2	-30.00	39	18056.32	-8.80	35.40	3.00	1.90	45.00	MODRSS		36.90		MODTES	CR		84.00		27M0F8W	HISPASAT-2	22	A	4, 7
ERI	ERI09200	23.00	39	18056.32	39.41	14.98	1.67	0.95	145.48	MODRSS		42.44		MODTES	CL		84.00		27M0F8W			P	4
F	F2aA2773	-7.00	39	18056.32	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2773	-7.00	39	18056.32	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		27M0F9W	RADIOSAT-3	19	A	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F	F3_A3373	-7.00	39	18056.32	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2773	-7.00	39	18056.32	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3373	-7.00	39	18056.32	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		76.60		33M0G9W	RADIOSAT-3	19	A	
F /EUT	E2WA7DA1	29.00	39	18056.32	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB1	29.00	39	18056.32	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC1	29.00	39	18056.32	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD1	29.00	39	18056.32	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE1	29.00	39	18056.32	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF1	29.00	39	18056.32	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG1	29.00	39	18056.32	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CL		84.00		27M0F9W	EUROPESAT-1	16	AE	9
GHA	GHA10800	-25.00	39	18056.32	-1.20	7.90	1.48	1.06	102.00	MODRSS		42.49		MODTES	CR		83.00		27M0F8W			P	
GNE	GNE30300	-19.00	39	18056.32	10.30	1.50	0.68	0.60	10.00	MODRSS		48.34		MODTES	CR		84.00		27M0F8W			P	
HOL	HOL21300	-19.00	39	18056.32	5.40	52.00	0.76	0.60	171.00	MODRSS		47.86		MODTES	CL		84.00		27M0F8W			P	
ISL	ISL05000	5.00	39	18056.32	-19.50	61.00	2.20	0.80	4.00	MODRSS		41.99		MODTES	CL		84.00		27M0F8W			P	
JOR	JOR22400	11.00	39	18056.32	35.80	31.40	0.84	0.78	114.00	MODRSS		46.28		MODTES	CR		85.00		27M0F8W			P	
MNG	MNG24800	74.00	39	18056.32	107.50	47.80	2.00	2.00	0.00	MODRSS		38.43		MODTES	CR		89.02		27M0F8W			P	
NOR	BIFROS21	-0.80	39	18056.32	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CR		84.00		27M0FXF	BIFROST-2		A	
RUS	RSTRSA11	36.00	39	18056.32	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA21	56.00	39	18056.32	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA31	86.00	39	18056.32	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA51	140.00	39	18056.32	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD11	36.00	39	18056.32	38.00	53.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD21	56.00	39	18056.32	65.00	63.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD31	86.00	39	18056.32	97.00	62.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD51	140.00	39	18056.32	158.00	56.00					COP	38.40	8.40	MODTES	CR		84.00		27M0G7W	RST-5	42	P	
RUS	RUS00400	110.00	39	18056.32	118.22	51.52					COP	38.40	8.40	MODTES	CR		84.00		27M0F8W			P	3, 4, 7
SDN	SDN23000	-7.00	39	18056.32	29.90	9.80	2.95	2.17	123.00	MODRSS		36.38		MODTES	CL		86.00		27M0F8W			P	
SRL	SRL25900	-33.50	39	18056.32	-11.80	8.60	0.78	0.68	114.00	MODRSS		47.20		MODTES	CL		84.00		27M0F8W			P	4
TKM	TKM06800	44.00	39	18056.32	59.18	38.84	2.25	0.99	164.51	MODRSS		40.94		MODTES	CL		84.00		27M0F8W			P	4, 7
ZWE	ZWE13500	-1.00	39	18056.32	29.60	-18.80	1.46	1.36	37.00	MODRSS		41.47		MODTES	CR		85.00		27M0F8W			P	
ARM	ARM06400	23.00	40	18075.50	44.99	39.95	0.73	0.60	148.17	MODRSS		48.02		MODTES	CL		84.00		27M0F8W			P	4
AUS	AUS00600	152.00	40	18075.50	135.50	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	CR		87.00		27M0F8W			P	
CAF	CAF25800	-13.00	40	18075.50	21.00	6.30	2.25	1.68	31.00	MODRSS		38.67		MODTES	CR		84.00		27M0F8W			P	
F	F2_A2788	-7.00	40	18075.50	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CR		84.00		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2784	-7.00	40	18075.50	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F2aA2788	-7.00	40	18075.50	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-2	19	A	
F	F3_A2784	-7.00	40	18075.50	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A2788	-7.00	40	18075.50	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		27M0F9W	RADIOSAT-3	19	A	
F	F3_A3384	-7.00	40	18075.50	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	

1	2	3	4	5	6		7			8	9	10		11	12		13	14	15	16	17	18	19
Admin. Symbol	Beam Identification	Orbital Position°	Chan-nel	Centre Frequency	Boresight		Space Antenna Character.			Space Antenna	Shap. Beam	Space Ant. Gain		Earth Antenna	Polarization		EIRP dBW	Power Control	Designation of Emission	Satellite Identification	Group Code	Status	Re-marks
					Long.°	Lat.°	Major°	Minor°	Orient.°			Co-pol.	X-pol.		Typ.	Angle							
F	F3_A3388	-7.00	40	18075.50	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0F9W	RADIOSAT-3	19	A	
F	F3_D2784	-7.00	40	18075.50	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D2788	-7.00	40	18075.50	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3384	-7.00	40	18075.50	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	F3_D3388	-7.00	40	18075.50	3.88	48.20	0.70	0.70	0.00	MODRSS		41.00		MODTES	CL		76.60		33M0G9W	RADIOSAT-3	19	A	
F	MYT09800	29.00	40	18075.50	45.10	-12.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	CL		84.00		27M0F8W		7	P	
F	MYT09801	29.00	40	18075.50	3.60	45.60	1.97	1.71	22.00	MODRSS		39.17		MODTES	CL		84.00		27M0F8W		7	P	
F /EUT	E2WA7DA2	29.00	40	18075.50	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DB2	29.00	40	18075.50	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DC2	29.00	40	18075.50	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DD2	29.00	40	18075.50	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DE2	29.00	40	18075.50	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DF2	29.00	40	18075.50	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
F /EUT	E2WA7DG2	29.00	40	18075.50	16.30	44.30	5.77	2.96	11.00	R13RSS		32.50		R13TES	CR		84.00		27M0F9W	EUROPESAT-1	16	AE	9
I	I 08200	-19.00	40	18075.50	12.30	41.30	2.38	0.98	137.00	MODRSS		40.77		MODTES	CR		84.00		27M0F8W			P	
IRQ	IRQ25600	11.00	40	18075.50	43.50	33.00	2.28	1.32	145.00	MODRSS		39.66		MODTES	CL		84.00		27M0F8W			P	
KAZ	KAZ06600	44.00	40	18075.50	64.72	46.40	4.31	1.70	172.22	MODRSS		35.79		MODTES	CR		84.00		27M0F8W			P	4, 7
LSO	LSO30500	5.00	40	18075.50	27.80	-29.80	0.66	0.60	36.00	MODRSS		48.47		MODTES	CL		84.00		27M0F8W			P	
MTN	MTN28800	-37.00	40	18075.50	-7.80	23.40	1.63	1.10	141.00	MODRSS		41.91		MODTES	CL		86.00		27M0F8W			P	
MWI	MWI30800	-1.00	40	18075.50	34.10	-13.00	1.54	0.60	87.00	MODRSS		44.79		MODTES	CL		84.00		27M0F8W			P	
NGR	NGR11500	-25.00	40	18075.50	8.30	16.80	2.54	2.08	44.00	MODRSS		37.22		MODTES	CL		85.00		27M0F8W			P	
NOR	BIFROS22	-0.80	40	18075.50	17.00	61.50	2.00	1.00	10.00	MODRSS		41.00		MODTES	CL		84.00		27M0FXF	BIFROST-2		A	
OMA	OMA12300	17.00	40	18075.50	55.60	21.00	1.88	1.02	100.00	MODRSS		41.62		MODTES	CR		85.00		27M0F8W			P	
POR	AZR13400	-30.00	40	18075.50	-23.40	36.10	2.56	0.70	158.00	MODRSS		41.91		MODTES	CL		84.00		27M0F8W			P	7
RUS	RSTRSA12	36.00	40	18075.50	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-1	38	P	
RUS	RSTRSA22	56.00	40	18075.50	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-2	39	P	
RUS	RSTRSA32	86.00	40	18075.50	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-3	40	P	
RUS	RSTRSA52	140.00	40	18075.50	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0F8W	RST-5	42	P	
RUS	RSTRSD12	36.00	40	18075.50	38.00	53.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-1	38	P	
RUS	RSTRSD22	56.00	40	18075.50	65.00	63.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-2	39	P	
RUS	RSTRSD32	86.00	40	18075.50	97.00	62.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-3	40	P	
RUS	RSTRSD52	140.00	40	18075.50	158.00	56.00					COP	38.40	8.40	MODTES	CL		84.00		27M0G7W	RST-5	42	P	
S	S 13902	5.00	40	18075.50	17.00	61.50	2.00	1.00	10.00	R13RSS		41.44		R13TES	CR		84.00		27M0F8W			PE	
SDN	SDN23200	-7.00	40	18075.50	29.60	18.40	2.54	2.09	167.00	MODRSS		37.20		MODTES	CR		86.00		27M0F8W			P	

ARTICLE 10

Interference

MOD 10.1 The Member States of the Union shall endeavour to agree on the action required to reduce harmful interference which might be caused by the application of these provisions and the associated Plans.

NOC ARTICLE 11

NOC ANNEX 1

ANNEX 2

Basic Characteristics to be Furnished in Notices[1] Relating to Feeder-Link Stations in the Fixed-Satellite Service Operating in the Frequency Bands 14.5-14.8 GHz and 17.3-18.1 GHz[2]

NOC 1. to 1.6 *h)*

ADD 1.6 *i)* in the case of a digital modulation, the effective and transmitted bit/symbol rates.

NOC 2. and 2.1

MOD 2.2 For a specific feeder-link earth station, identity of the earth station and the geographical coordinates of the antenna site.

MOD 2.3 Feeder-link service area identified by:

MOD *a)* a set of a maximum of twenty feeder-link test points, and

ADD *b)* a service-area contour on the surface of the Earth or a service area defined by a minimum elevation angle in degrees.

NOC 2.4 to 2.5 *a)*

MOD 2.5 *b)* Additional information required if power control is used (see § 3.11 and 4.10 of Annex 3 to this Appendix):

– range, expressed in dB, above the transmitting power used in § *a)* above.

NOC 2.6 to 2.6 *e)*

MOD 2.6 *f)* sense of polarization, and, in the case of a linear polarization, the angle (degrees) measured counter-clockwise in a plane normal to the beam axis from the equatorial plane to the electric vector of the wave as seen from the satellite in the direction of the nominal boresight or aim point as defined under § 3.4 *e)* or 3.4 *f)* below;

NOC 2.6 *g)* to 2.10

MOD 2.11 Operating administration or agency.

NOC 3. to 3.4

MOD 3.4 *a)* co-polar gain of the antenna in the direction of maximum radiation referred to an isotropic radiator (dBi), as well as the cross-polar gain of the antenna in the case of a beam of other than elliptical shape;

NOC 3.4 *b)* and *c)*

MOD 3.4 *d)* sense of polarization, and, in the case of a linear polarization, the angle (degrees) measured counter-clockwise in a plane normal to the beam axis from the equatorial plane to the electric vector of the wave as seen from the satellite in the direction of the nominal boresight or aim point as defined under § 3.4 *e)* or 3.4 *f)* below;

MOD 3.4 *e)* for elliptical beams[1], indicate the following:

– co-polar and cross-polar radiation patterns;

– rotation accuracy (degrees);

– orientation (degrees);

– major axis (degrees) at the half-power beamwidth;

– minor axis (degrees) at the half-power beamwidth;

– nominal intersection of the antenna beam axis with the Earth (boresight longitude and latitude);

MOD 3.4 *f)* for beams of other than elliptical shape, indicate the following:

– co-polar and cross-polar gain contours plotted on a map of the Earth's surface, preferably in a radial projection from the satellite onto a plane perpendicular to the axis from the centre of the Earth to the satellite. The isotropic gain shall be indicated at each contour which corresponds to a decrease in gain of 2, 4, 6, 10 and 20 dB and thereafter at 10 dB intervals down to a value of 0 dB relative to an isotropic radiator;

– wherever practicable, a numerical equation or table providing the necessary information to allow the gain contours to be plotted;

– nominal intersection of the antenna beam axis with the Earth (boresight or aim point, longitude and latitude);

NOC 3.4 *g)* to 3.11

(MOD) 3.12 Range of automatic gain control[2] .

ADD [1] A circular beam is considered as a particular elliptical beam where the major and minor axes are equal and where the major axis orientation and rotational accuracy are equal to 0°.

MOD [2] See § 3.10 and 4.9 of Annex 3 to this Appendix.

ADD 4. Connection between Earth-to-space and space-to-Earth frequencies in the network in the case of Region 2.

ADD 5. Description of the group(s) required in the case of non-simultaneous emissions.

ANNEX 3

(MOD) **Technical Data Used in Establishing the Provisions and Associated Plans and Which Should be Used for their Application[1]**

1. DEFINITIONS

MOD 1.1 *Feeder link*

The term feeder link, as defined in No. **S1.115** of the Radio Regulations, is further qualified to indicate a fixed-satellite service link in the frequency band 17.3-17.8 GHz in the Region 2 broadcasting-satellite service Plan and in the frequency bands 14.5-14.8 GHz for countries outside Europe, and 17.3-18.1 GHz in the Regions 1 and 3 Plan, from any earth station within the feeder-link service area to the associated space station in the broadcasting-satellite service.

ADD [1] In revising this Annex at the 1997 World Radiocommunication Conference, no changes were made to the technical data applicable to the Region 2 Plan. However, for all three Regions it should be noted that some of the parameters of networks proposed as modifications to the Plans may differ from the technical data presented herein.

NOC 1.2 to 1.4

(MOD) 1.5 *Adjacent channel*

The RF channel in the broadcasting-satellite service frequency Plan, or in the associated feeder-link frequency Plan, which is situated immediately higher or lower in frequency with respect to the reference channel.

MOD 1.6 *Second adjacent channel*

The RF channel in the broadcasting-satellite service frequency Plan, or in the associated feeder-link frequency Plan, which is situated immediately beyond either of the adjacent channels, with respect to the reference channel.

(MOD) 1.7 *Feeder-link equivalent protection margin for Regions 1 and 3*[1]

The feeder-link equivalent protection margin (M_u) is given by the formula:

$$M_u = -10 \log (10^{-M_1/10} + 10^{-M_2/10} + 10^{-M_3/10}) \text{ dB}$$

ADD [1] This quantity is used in the alternative formula for the overall equivalent protection margin given in § 1.12 below. However, in certain cases (e.g. when the channel spacing and/or bandwidth are different from the values given in § 3.5 and 3.8 of Annex 5 to Appendix **S30**, equivalent protection margins for the second adjacent channels may be used. Appropriate protection masks included in ITU-R Recommendations should be used if available. Until a relevant ITU-R Recommendation is incorporated in this Annex by reference, the Bureau will use the worst-case approach as adopted by the Radio Regulations Board.

where:

M_1 is the value in dB of the protection margin for the same channel, i.e.:

$$M_1 = \left[\frac{\text{wanted power}}{\text{sum of the co-channel interfering powers}} \right] - \text{co-channel protection ratio}$$

M_2 and M_3 are the values in dB of the protection margin for the upper and lower adjacent channels, respectively, i.e.:

$$M_2 = \left[\frac{\text{wanted power}}{\text{sum of the upper adjacent channel interfering powers}} \right] - \text{adjacent channel protection ratio}$$

$$M_3 = \left[\frac{\text{wanted power}}{\text{sum of the lower adjacent channel interfering powers}} \right] - \text{adjacent channel protection ratio}$$

All powers are evaluated at the receiver input. All protection ratios are given in § 3.3 of this Annex.

MOD 1.8 *Overall carrier-to-interference ratio*

The overall carrier-to-interference ratio is the ratio of the wanted carrier power to the sum of all interfering RF powers in a given channel including both feeder links and downlinks. The overall carrier-to-interference ratio due to interference from the given channel is calculated as the reciprocal

of the sum of the reciprocals of the feeder-link carrier-to-interference ratio and the downlink carrier-to-interference ratio referred to the satellite receiver input and earth station receiver input, respectively[1].

MOD 1.9 *Overall co-channel protection margin*

The overall co-channel protection margin in a given channel is the difference in dB between the overall co-channel carrier-to-interference ratio and the co-channel protection ratio.

MOD 1.10 *Overall adjacent channel protection margin*

The overall adjacent channel protection margin is the difference, in dB, between the overall adjacent channel carrier-to-interference ratio and the adjacent channel protection ratio.

MOD 1.11 *Overall second adjacent channel protection margin*

The overall second adjacent channel protection margin is the difference in dB between the overall second adjacent channel carrier-to-interference ratio and the second adjacent channel protection ratio.

MOD [1] In Region 2, there are a total of five overall carrier-to-interference ratios used in the analysis of the Plan, namely, co-channel, upper and lower adjacent channels and upper and lower second adjacent channels. In Regions 1 and 3, three ratios are used, namely, co-channel and upper and lower adjacent channels.

MOD 1.12 *Overall equivalent protection margin*

The overall equivalent protection margin M is given in dB by the expression[1]:

$$M = -10 \log \left(\sum_{i=1}^{n} 10^{\left(-M_i/10\right)} \right)$$

where:

n is generally equal to 3 for Regions 1 and 3, n is equal to 5 for Region 2;

M_1 = overall co-channel protection margin, in dB (as defined in § 1.9);

M_2, M_3 = overall adjacent channel protection margins for the upper and lower adjacent channels, respectively, in dB (as defined in § 1.10);

M_4, M_5 = overall second adjacent channel protection margins for the upper and lower second adjacent channels, respectively, in dB (as defined in § 1.11).[2]

ADD [1] This formula is also used to calculate the overall equivalent protection margin of the assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997.

ADD [2] M_4 and M_5 are applicable only for Region 2. However, in certain cases (e.g. when the channel spacing and/or bandwidth are different from the values given in § 3.5 and 3.8 of Annex 5 to Appendix **S30**), these margins may also be used for Regions 1 and 3. Appropriate protection masks included in ITU-R Recommendations should be used if available. Until a relevant ITU-R Recommendation is incorporated in this Annex by reference, the Bureau will use the worst-case approach as adopted by the Radio Regulations Board.

The adjective “equivalent” indicates that the protection margins for all interference sources from the adjacent and second adjacent as well as co-channel interference sources have been included.

The following alternative formula for overall equivalent protection margin was used at the 1988 Conference (WARC Orb-88) in developing the original feeder-link Plan for Regions 1 and 3. It may be used as a tool to assess the relative contributions of the feeder link and downlink to the overall equivalent protection margin defined above .

$$M = -10 \log \left(10^{-(M_u + R_{cu})/10} + 10^{-(M_d + R_{cd})/10} \right) - R_{co}$$

where:

M_u = equivalent protection margin for the feeder link (as defined in § 1.7 of this Annex);

M_d = equivalent protection margin for the downlink (as defined in § 3.4, Annex 5 to Appendix **S30**;

R_{cu} = co-channel feeder-link protection ratio;

R_{cd} = co-channel downlink protection ratio;

R_{co} = co-channel overall protection ratio.

The values of the protection ratios used for the 1988 feeder-link Plan were as follows:

R_{cu} = 40 dB

R_{cd} = 31 dB

R_{co} = 30 dB

The adjective “equivalent” indicates that the protection margins for all interference sources from the adjacent channels as well as co-channel interference sources have been included.

The corresponding values for analysing the 1997 feeder-link Plan are:

R_{cu} = 30 dB

R_{cd} = 24 dB

R_{co} = 23 dB

However, the latter values are restricted to the case of channels having the standard channel spacing and necessary bandwidth given in § 3.5 and 3.8, respectively, of Annex 5 to Appendix **S30**.

2. RADIO PROPAGATION FACTORS

The propagation loss on an Earth-to-space path is equal to the free-space path loss plus the atmospheric absorption loss plus the rain attenuation exceeded for 1% of the worst month in Region 2. In Regions 1 and 3, the atmospheric absorption loss is not included.

MOD 2.1 *Atmospheric absorption*

For Region 2 (see Figure 2)

The loss due to atmospheric absorption (i.e. clear-sky attenuation) is given by:

$$A_a = \frac{92.20}{\cos\theta}\left(0.020F_o + 0.008\,\rho F_w\right) \quad \text{dB} \qquad \text{for } \theta < 5°$$

where:

$$F_o = \left\{24.88\tan\theta + 0.339\sqrt{1416.77\tan^2\theta + 5.51}\right\}^{-1}$$

$$F_w = \left\{40.01\tan\theta + 0.339\sqrt{3663.79\tan^2\theta + 5.51}\right\}^{-1}$$

and:

$$A_a = \frac{0.0478 + 0.0118\,\rho}{\sin\theta} \quad \text{dB} \quad \text{for } \theta \geq 5°$$

where:

θ = elevation angle (degrees),

ρ = surface water vapour concentration, g/m^3, with

ρ = 10 g/m^3 for rain climatic zones A to K and

ρ = 20 g/m^3 for rain climatic zones M to P

For Regions 1 and 3 (see Figures 1 and 3 taken from Recommendation ITU-R P.837-1)

In the Regions 1 and 3 feeder-link Plan, the atmospheric absorption loss is not included for the calculation of margins.

MOD 2.2 *Rain attenuation*

The propagation model for feeder links using circularly polarized signals is based on the value of rain attenuation for 1% of the worst month.

Figures 1, 2 and 3 give the rain climatic zones for Regions 1, 2 and 3.

Figure 4 presents a plot of rain attenuation of circularly polarized signals exceeded for 1% of the worst month at 17.5 GHz as a function of earth station latitude and elevation angle for each of the rain climatic zones in Region 2.

For calculation, the following data are needed:

$R_{0.01}$: point rainfall rate for the location exceeded for 0.01% of an average year (mm/h)

h_0: height above mean sea level of the earth station (km)

θ: elevation angle (degrees)

f: frequency (GHz)

ζ: latitude of earth station (degrees).

Mean frequencies will be used for calculations for the frequency bands, i.e. 17.7 GHz and 14.65 GHz for Regions 1 and 3, 17.5 GHz for Region 2.

The calculation procedure used for the Region 2 feeder-link Plan and for the original 1988 Regions 1 and 3 feeder-link Plan consists of the following seven steps:

Step 1: The mean zero-degree isotherm height h_F is:

$$h_F = 5.1 - 2.15 \log\left[1 + 10^{\frac{(|\zeta| - 27)}{25}}\right] \quad \text{km}$$

Step 2: The rain height h_R is:

$$h_R = C \cdot h_F \quad \text{km}$$

where:

$C = 0.6$ for $0° \leq |\zeta| < 20°$

$C = 0.6 + 0.02\,(|\zeta| - 20)$ for $20° \leq |\zeta| < 40°$

$C = 1$ for $|\zeta| \geq 40°$

Step 3: The slant-path length, L_s, below the rain height is:

$$L_s = \frac{2(h_R - h_0)}{\left[\sin^2\theta + 2\frac{(h_R - h_0)}{R_e}\right]^{1/2} + \sin\theta} \quad \text{km}$$

where:

R_e is the effective radius of the Earth (8 500 km)

Step 4: The horizontal projection, L_G, of the slant-path is:

$$L_G = L_s \cos\theta \qquad \text{km}$$

Step 5: The rain path reduction factor $r_{0.01}$, for 0.01% of the time is:

$$r_{0.01} = \frac{90}{90 + 4L_G}$$

Step 6: The specific attenuation γ_R is determined from:

$$\gamma_R = k\,(R_{0.01})^{\alpha} \qquad \text{dB/km}$$

where:

$R_{0.01}$ is given in Table 5 for each rain climatic zone. The frequency dependent coefficients k and α are given in Table 6 and the rain climatic zones are given in Figures 1, 2 and 3 for Regions 1, 2 and 3.

MOD

TABLE 5

Rainfall intensity (R) for the rain climatic zones
(exceeded for 0.01% of an average year)

Rain climatic zone	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
Rainfall intensity (mm/h)	8	12	15	19	22	28	30	32	35	42	60	63	95	145	115

NOC TABLE 6

Step 7: The attenuation exceeded for 1% of the worst month is:

$$A_{1\%} = 0.223\ \gamma_R\ L_s\ r_{0.01}\ \text{dB} \qquad \text{for Regions 1 and 3}$$

$$A_{1\%} = 0.21\ \gamma_R\ L_s\ r_{0.01}\ \text{dB} \qquad \text{for Region 2}$$

For calculation of the permissible increase in e.i.r.p. to overcome rain fading (power control, see § 3.11.1 of this Annex) in the Regions 1 and 3 Plan revised by the 1997 World Radiocommunication Conference, the same calculation procedure is used with the following changes to conform to Recommendation ITU-R P.618-5.

To calculate the rain height h_R, *steps 1* and *2* are replaced by:

$$h_R = \begin{cases} 5 - 0.075\,(\zeta - 23) & \text{for } \zeta > 23^\circ & \text{Northern Hemisphere} \\ 5 & \text{for } 0^\circ \le \zeta \le 23^\circ & \text{Northern Hemisphere} \\ 5 & \text{for } 0^\circ \ge \zeta \ge -21^\circ & \text{Southern Hemisphere} \\ 5 + 0.1\,(\zeta + 21) & \text{for } -71^\circ \le \zeta < -21^\circ & \text{Southern Hemisphere} \\ 0 & \text{for } \zeta < -71^\circ & \text{Southern Hemisphere} \end{cases}$$

Steps 3 and *4* remain the same. However, to calculate the rain path reduction factor $r_{0.01}$, for 0.01% of the time, the equation of *Step 5* is replaced by:

$$r_{0.01} = \frac{1}{1 + L_G / L_0}$$

where:

$L_0 = 35 \exp(-0.015\ R_{0.01})$

and $R_{0.01}$ is given in Table 5 for each rain climatic zone.

Step 6 remains the same except the frequency dependent coefficients k and α shall be obtained from Recommendation ITU-R P.838.

Step 7 should be replaced as follows:

$$\frac{A_p}{A_{0.01}} = 0.12\, p^{-(0.546 + 0.043 \log p)}$$

where:

$$p\ (\%) = 0.30\, p_w\ (\%)^{1.15} \qquad \text{(Recommendation ITU-R P.841)}$$

p is the average annual time percentage of excess corresponding to desired worst-month time percentage of excess p_w.

NOC 2.3

MOD 2.4 *Depolarization*

Rain and ice can cause depolarization of radio frequency signals. The level of the co-polar component relative to the depolarized component is given by the cross-polarization discrimination (XPD) ratio. For the feeder link, the XPD ratio, in dB, not exceeded for 1% of the worst month, is given by:

$$\text{XPD} = 30 \log f - 40 \log (\cos \theta) - V \log A_p \text{ for } 5° \leq \theta \leq 60°$$

where:

$V = 20$ for 14.5-14.8 GHz

and

$V = 23$ for 17.3-18.1 GHz

where:

A_p: co-polar rain attenuation exceeded for 1% of the worst month

f: frequency (GHz)

θ: elevation angle (degrees)

To calculate the depolarization value to be used for power control in the Regions 1 and 3 Plan, the following algorithm, which was obtained from Recommendation ITU-R P.618-5, shall be used:

To calculate long-term statistics of depolarization from rain attenuation statistics the following parameters are needed:

A_p: rain attenuation (dB) exceeded for the required percentage of time, p, for the path in question, commonly called co-polar attenuation (CPA)

τ: tilt angle of the linearly-polarized electric field vector with respect to the horizontal (for circular polarization use $\tau = 45°$)

f: frequency (GHz)

θ: path elevation angle (degrees).

The method described below to calculate XPD statistics from rain attenuation statistics for the same path is valid for $8 \text{ GHz} \le f \le 35$ GHz and $\theta \le 60°$.

Step 1: Calculate the frequency-dependent term:

$$C_f = 30 \log f \qquad \text{for } 8 \text{ GHz} \le f \le 35 \text{ GHz}$$

Step 2: Calculate the rain attenuation dependent term:

$$C_A = V(f) \log A_p$$

where:

$$V(f) = 12.8 f^{0.19} \qquad \text{for } 8 \text{ GHz} \le f \le 20 \text{ GHz}$$

$$V(f) = 22.6 \qquad \text{for } 20 \text{ GHz} < f \le 35 \text{ GHz}$$

Step 3: Calculate the polarization improvement factor:

$$C_\tau = -10 \log \left[1 - 0.484 (1 + \cos 4\tau)\right]$$

The improvement factor $C_\tau = 0$ for $\tau = 45°$ and reaches a maximum value of 15 dB for $\tau = 0°$ or $90°$.

Step 4: Calculate the elevation angle dependent term:

$$C_\theta = -40 \log (\cos \theta) \quad \text{for } \theta \le 60°$$

Step 5: Calculate the canting angle dependent term:

$$C_\sigma = 0.0052\ \sigma^2$$

σ is the effective standard deviation of the raindrop canting angle distribution, expressed in degrees; σ takes the value 0°, 5°, 10° and 15° for 1%, 0.1%, 0.01% and 0.001% of the time, respectively.

Step 6: Calculate rain XPD not exceeded for p% of the time:

$$XPD_{rain} = C_f - C_A + C_\tau + C_\theta + C_\sigma \quad \text{dB}$$

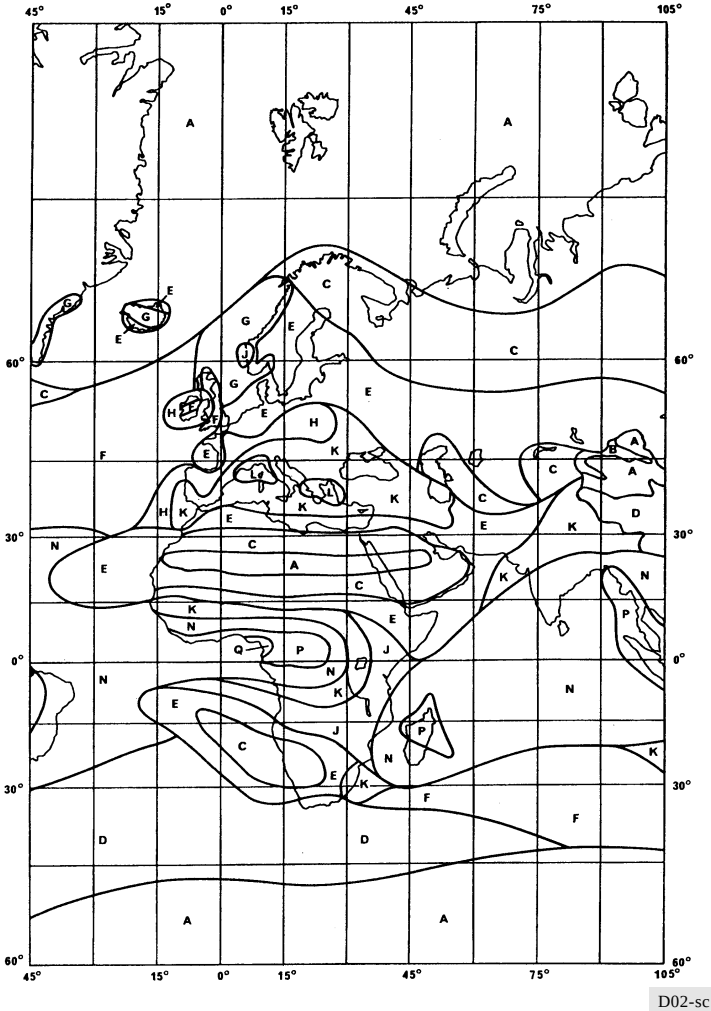
Step 7: Calculate the ice crystal dependent term:

$$C_{ice} = XPD_{rain}\ (0.3 + 0.1 \log p) / 2 \quad \text{dB}$$

Step 8: Calculate the XPD not exceeded for p% of the time, including the effects of ice:

$$XPD_p = XPD_{rain} - C_{ice} \quad \text{dB}$$

For values of θ greater than 60°, use $\theta = 60°$ in the above equations.



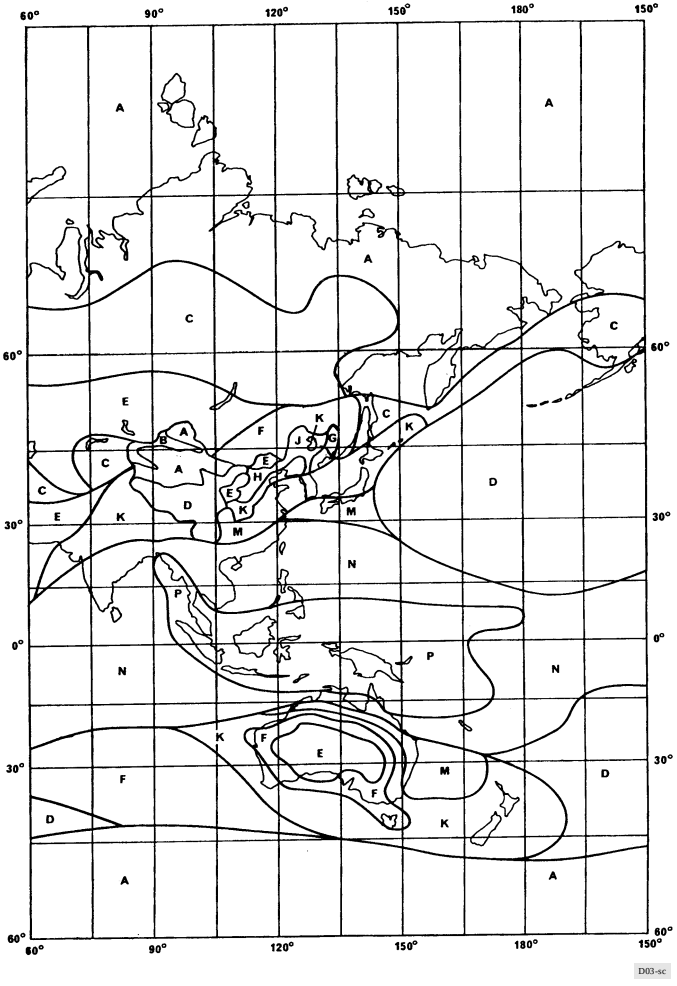
D02-sc

MOD

FIGURE 1

Rain climatic zones for Regions 1 and 3 between longitudes 45° W and 105° E

NOC FIGURE 2



(MOD) FIGURE 3

Rain climatic zones for Regions 1 and 3 between longitudes 60° E and 150° W

NOC FIGURE 4

NOC 2.5

3. BASIC TECHNICAL CHARACTERISTICS FOR REGIONS 1 AND 3

MOD 3.1 *Translation frequency and guardbands*

a) 17 GHz feeder links

The feeder-link Plan generally uses a frequency translation of 5.6 GHz between the 17 GHz feeder-link channels and the 12 GHz downlink channels. Other values of the translation frequency may be used, provided that the corresponding channels have been assigned to the space station of the administration concerned.

With the value of frequency translation between the feeder-link frequency band (17.3-18.1 GHz in Regions 1 and 3) and the downlink frequency band (11.7-12.5 GHz in Region 1 and 11.7-12.2 GHz in Region 3), the guardbands specified in § 3.9 of Annex 5 to Appendix **30/S30** for the downlink Plan result in corresponding guardband bandwidths of 11 MHz at the upper and 14 MHz at the lower feeder-link band edges. These feeder-link guardbands may be used for transmissions in the space operation service.

b) 14 GHz feeder links

As the maximum available bandwidth for the feeder-link band 14.5-14.8 GHz is only 300 MHz divided into fourteen 27 MHz channels, against 800 MHz (40 channels) and 500 MHz (24 channels) in the downlink Plan for Regions 1 and 3, respectively, several translation frequencies must be considered to allow any channel in the Plan to be used. Consequently, a particular feeder-link channel has been assigned to several broadcasting-satellite service Plan channels simultaneously.

Generally, the translation frequencies from the feeder-link channels are:

2 797.82 MHz to downlink broadcasting-satellite service channels 1 to 14

2 529.30 MHz to downlink broadcasting-satellite service channels 15 to 28

2 260.78 MHz to downlink broadcasting-satellite service channels 29 to 40

The guardband bandwidths are 11.80 MHz at the lower band edge and 11.86 MHz at the upper band edge.

c) *Frequency translation rules*

Specific rules for selecting appropriate frequency translations are given in § 6.2.1.2.2 and 6.2.1.3.3 of the 1985 Conference (WARC Orb-85) Report to the 1988 Conference (WARC Orb-88). These rules permit the derivation of simple-to-use tables that define the channel translations that were avoided in revising the Regions 1 and 3 feeder-link Plan for both the 14 GHz and 17 GHz bands (see Tables 7 and 8).

ADD

TABLE 7

14.5-14.8 GHz/11.7-12.5 GHz channel translations that should be avoided (as far as possible) according to the 1985 Conference frequency translation rules

14 GHz uplink channel number	Downlink channel numbers to be avoided (as far as possible)				
1	7	8	9	19	20
2	8	9	10	20	21
3	9	10	11	21	22
4	10	11	12	22	23
5	11	12	13	23	24
6	12	13	14	24	25
7	13	14	15	25	26
8	14	15	16	26	27
9	15	16	17	27	28
10	16	17	18	28	29
11	17	18	19	29	30
12	18	19	20	30	31
13	19	20	21	31	32
14	20	21	22	32	33

ADD

TABLE 8

17.3-18.1 GHz/11.7-12.5 GHz channel translations that should be avoided (as far as possible) according to the 1985 Conference frequency translation rules

17 GHz uplink channel number	Downlink channel numbers to be avoided (as far as possible)																														
1			10	11	12	13	14	15	16	17	18	19	20	21	22																
2			11	12	13	14	15	16	17	18	19	20	21	22	23																
3			12	13	14	15	16	17	18	19	20	21	22	23	24																
4			13	14	15	16	17	18	19	20	21	22	23	24	25																
5			14	15	16	17	18	19	20	21	22	23	24	25	26																
6			15	16	17	18	19	20	21	22	23	24	25	26	27																
7			16	17	18	19	20	21	22	23	24	25	26	27	28																
8			17	18	19	20	21	22	23	24	25	26	27	28	29																
9			18	19	20	21	22	23	24	25	26	27	28	29	30																
10	1			19	20	21	22	23	24	25	26	27	28	29	30	31															
11	1	2			20	21	22	23	24	25	26	27	28	29	30	31	32														
12	1	2	3			21	22	23	24	25	26	27	28	29	30	31	32	33														
13	1	2	3	4			22	23	24	25	26	27	28	29	30	31	32	33	34													
14	1	2	3	4	5			23	24	25	26	27	28	29	30	31	32	33	34	35												
15	1	2	3	4	5	6			24	25	26	27	28	29	30	31	32	33	34	35	36											
16	1	2	3	4	5	6	7			25	26	27	28	29	30	31	32	33	34	35	36	37										
17	1	2	3	4	5	6	7	8			26	27	28	29	30	31	32	33	34	35	36	37	38									
18	1	2	3	4	5	6	7	8	9			27	28	29	30	31	32	33	34	35	36	37	38	39								
19	1	2	3	4	5	6	7	8	9	10			28	29	30	31	32	33	34	35	36	37	38	39	40							
20	1	2	3	4	5	6	7	8	9	10	11			29	30	31	32	33	34	35	36	37	38	39	40							
21	1	2	3	4	5	6	7	8	9	10	11	12			30	31	32	33	34	35	36	37	38	39	40							
22	1	2	3	4	5	6	7	8	9	10	11	12	13			31	32	33	34	35	36	37	38	39	40							
23	1	2	3	4	5	6	7	8	9	10	11	12	13	14			32	33	34	35	36	37	38	39	40							
24		2	3	4	5	6	7	8	9	10	11	12	13	14	15			33	34	35	36	37	38	39	40							
25			3	4	5	6	7	8	9	10	11	12	13	14	15	16			34	35	36	37	38	39	40							
26				4	5	6	7	8	9	10	11	12	13	14	15	16	17			35	36	37	38	39	40							
27					5	6	7	8	9	10	11	12	13	14	15	16	17	18			36	37	38	39	40							
28						6	7	8	9	10	11	12	13	14	15	16	17	18	19			37	38	39	40							
29							7	8	9	10	11	12	13	14	15	16	17	18	19	20			38	39	40							
30								8	9	10	11	12	13	14	15	16	17	18	19	20	21			39	40							
31									9	10	11	12	13	14	15	16	17	18	19	20	21	22			40							
32										10	11	12	13	14	15	16	17	18	19	20	21	22	23									
33											11	12	13	14	15	16	17	18	19	20	21	22	23	24								
34												12	13	14	15	16	17	18	19	20	21	22	23	24	25							
35													13	14	15	16	17	18	19	20	21	22	23	24	25	26						
36														14	15	16	17	18	19	20	21	22	23	24	25	26	27					
37															15	16	17	18	19	20	21	22	23	24	25	26	27	28				
38																16	17	18	19	20	21	22	23	24	25	26	27	28	29			
39																	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
40																		18	19	20	21	22	23	24	25	26	27	28	29	30	31	

(MOD) 3.2 *Carrier-to-noise ratio*

§ 3.3 of Annex 5 to Appendix **30/S30** provides guidance for planning and the basis for the evaluation of the carrier-to-noise (*C*/*N*) ratios of the feeder-link and downlink Plans.

As guidance for planning, the reduction in quality in the downlink due to thermal noise in the feeder link is taken as equivalent to a degradation in the downlink *C*/*N* ratio of approximately 0.5 dB not exceeded for 99% of the worst month.

For downlinks, as indicated in Appendix **30/S30**, the 1977 Conference (WARC-77) adopted a *C/N* value of 14.5 dB for 99% of the worst month at the edge of the service area. The required feeder-link *C/N* is 24 dB for 99% of the worst month, at the edge of the service area, to produce an overall *C/N* performance of 14 dB.

MOD 3.3 *Protection ratios*

For planning in Regions 1 and 3 at the 1988 Conference (WARC Orb-88), the following protection ratios were applied for the purpose of calculating the feeder-link equivalent protection margins[1]:

– co-channel protection ratio = 40 dB;

– adjacent channel protection ratio = 21 dB.

The method for the calculation of the feeder-link equivalent protection margin is given in § 1.7 of this Annex.

ADD [1] These protection ratio values may be used for assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997.

For revising the Regions 1 and 3 Plan at the 1997 World Radiocommunication Conference, the corresponding values of aggregate protection ratio that were used to calculate the feeder-link equivalent protection margins which appear in the alternative formula for overall equivalent protection margin given in § 1.12 of this Annex are specified in Recommendation ITU-R BO.1297, as follows:

– co-channel protection ratio = 30 dB;

– adjacent channel protection ratio = 22 dB.

However, it should be noted that the revision of the Regions 1 and 3 Plan by the 1997 World Radiocommunication Conference was, in accordance with Recommendation **521 (WRC-95)**, based on "simultaneous planning of feeder link and downlink with calculation of overall equivalent protection margins" (as defined in § 1.11 of Annex 5 to Appendix **30/S30** and in § 1.12 above) using the following values of aggregate protection ratio:

– co-channel = 23 dB;

– adjacent channel = 15 dB.

Recommendation **521 (WRC-95)** also specified that for the revision of the Regions 1 and 3 Plan no overall co-channel single entry carrier-to-interference ratio (*C*/*I*) should be lower than 28 dB.

Nevertheless, for assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997, the overall equivalent protection margins were calculated using a co-channel overall protection ratio of 30 dB and lower and upper overall adjacent channel protection ratios of 14 dB.

Revision of the Regions 1 and 3 Plan at the 1997 World Radiocommunication Conference was generally based on a set of reference parameters such as the average e.i.r.p., the reference earth station transmitting antenna, all test points placed within the –3 dB contour, a bandwidth of 27 MHz and the predetermined value of *C*/*N*.

Protection masks and associated calculation methods for interference into broadcasting-satellite systems involving digital emissions are given in Recommendation ITU-R BO.1293.

(MOD) 3.4 *Feeder-link e.i.r.p.*

The level of e.i.r.p. of each feeder link is specified in Article 9A of this Appendix.

The level of e.i.r.p. specified in the Plan can only be exceeded under certain conditions explained in § 3.11 of this Annex (see also Article 5, § 5.1.1 of this Appendix).

NOC 3.5

MOD 3.5.1 *Antenna diameter*

The feeder-link Plan is based on an antenna diameter of 5 metres for the band 17.3-18.1 GHz and 6 metres for the band 14.5-14.8 GHz.

For all antenna diameters including antennas smaller than 5 metres for the 17.3-18.1 GHz band and 6 metres for the 14.5-14.8 GHz band, the off-axis e.i.r.p. shall not exceed the limits indicated by curve A in Figure A of § 3.5.3 of this Annex for assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997 and by the curve A' of Figure A for other assignments.

NOC 3.5.2

MOD 3.5.3 *Off-axis e.i.r.p. of transmitting antennas*

The co-polar and cross-polar off-axis e.i.r.p. values used for the original 1988 feeder-link Plan in Regions 1 and 3 are shown by curves A and B respectively in Figure A[1].

The corresponding off-axis e.i.r.p. values used for planning at the 1997 World Radiocommunication Conference are shown by curves A' and B' in Figure A as specified in Recommendation ITU-R BO.1295.

MOD 3.5.4 *Pointing accuracy*

The Plan has been developed to accommodate a loss in gain of 1 dB due to earth station antenna mispointing.

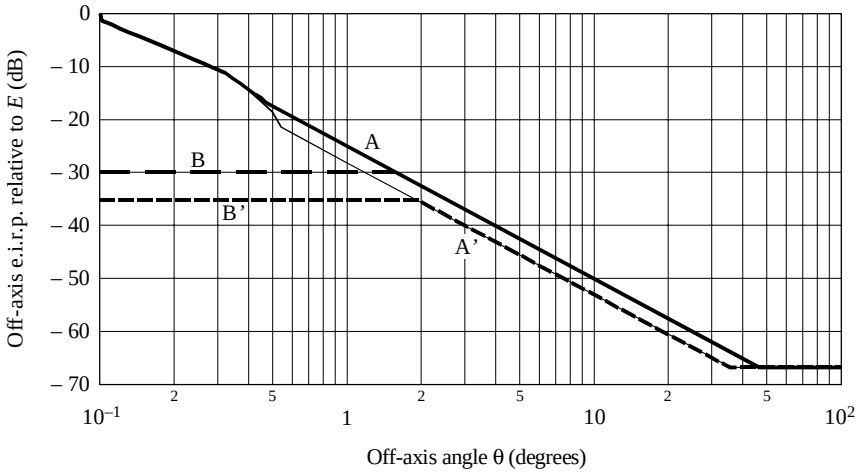
The deviation of the antenna beam from its nominal pointing direction must not exceed a limit of 0.1° in any direction. Moreover, the angular rotation of the receiving beam about its axis must not exceed a limit of $\pm$1°; the limit on rotation is not necessary for beams of circular cross section using circular polarization.

NOC 3.6 and 3.7

ADD [1] This antenna pattern is used in the revision of the Regions 1 and 3 Plan for assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997.

MOD 3.7.1 *Cross-section of receiving antenna beam*

Planning has generally been based on beams of elliptical or circular cross-section. When the assignments are implemented, or when the Plan is modified, administrations may use non-elliptical (shaped) beams as described in Annex 2 of this Appendix.



Curves A: WARC Orb-88 Regions 1 and 3 Co-polar
A': WRC-97 Co-polar
B: WARC Orb-88 Regions 1 and 3 Cross-polar
B': WRC-97 Cross-polar

AF97-06

MOD FIGURE A

Earth station e.i.r.p. at angles off antenna axis

Co-polar component in dBW:

Curve A (WARC Orb-88)							**Curve A' (WRC-97)**						
E	for	0^o	≤	θ	≤	0.1^o	E	for	0°	≤	θ	≤	0.1°
E – 21 – 20 log θ	for	0.1^o	<	θ	≤	0.32^o	E – 21 – 20 log θ	for	0.1^o	<	θ	≤	0.32^o
E – 5.7 – 53.2 θ^2	for	0.32^o	<	θ	≤	0.44^o	E – 5.7 – 53.2 θ^2	for	0.32^o	<	θ	≤	0.54^o
E – 25 – 25 log θ	for	0.44^o	<	θ	≤	48^o	E – 28 – 25 log θ	for	0.54^o	<	θ	≤	36.31^o
E – 67	for	48^o	<	θ			E – 67	for	36.31^o	<	θ		

Cross-polar component in dBW:

Curve B (WARC Orb-88)							**Curve B' (WRC-97)**						
E – 30	for	0^o	≤	θ	≤	1.6^o	E – 35	for	0^o	≤	θ	≤	1.91°
E – 25 – 25 log θ	for	1.6^o	<	θ	≤	48^o	E – 28 – 25 log θ	for	1.91^o	<	θ	≤	36.31^o
E – 67	for	48^o	<	θ			E – 67	for	36.31^o	<	θ		

where:

E is the earth station e.i.r.p. on the antenna axis (dBW);

θ is the off-axis angle referred to the main lobe axis (degrees).

For planning purposes at the 1997 World Radiocommunication Conference, an antenna diameter of 5 metres for the band 17.3-18.1 GHz and 6 metres for the band 14.5-14.8 GHz were assumed.

The on-axis gain for the 5-metre antenna at 17.3-18.1 GHz and for the 6-metre antenna at 14.5 to 14.8 GHz is taken as 57 dBi.

If the cross-section of the receiving antenna beam is elliptical, the effective beamwidth φ_0 is a function of the angle of rotation q between the plane containing the satellite and the major axis of the beam cross-section and the plane in which the beamwidth is required.

The relationship between the maximum gain of an antenna and the half-power beamwidth can be derived from the expression:

$$G_m = 27\,843/ab$$

where:

a and *b* are the angles (degrees) subtended at the satellite by the major and minor axes of the elliptical cross-section of the beam. An antenna efficiency of 55% is assumed.

NOC 3.7.2

MOD 3.7.3 *Reference patterns*

The reference patterns for the co-polar and cross-polar components of the satellite receiving antenna used for planning at the 1988 Conference (WARC Orb-88) are given by curves A and B respectively in Figure B[1].

The corresponding curves used for replanning at the 1997 World Radiocommunication Conference are given by curves A' and B' in Figure B, as specified in Recommendation ITU-R BO.1296.

In some cases, to reduce co-polar interference, the pattern shown in Figure C is used; this use is indicated in the Plan by note 1. This pattern is derived from an antenna producing an elliptical beam with fast roll-off in the main lobe assuming a "beamlet" beamwidth of 0.6^{o}. Three curves for different values of φ_0 are shown as examples.

MOD 3.7.4 *Pointing accuracy*

The deviation of the receiving antenna beam from its nominal pointing direction must not exceed 0.1^{o} in any direction. Moreover, the angular rotation of the receiving beam about its axis must not exceed $\pm 1°$; this limit is not necessary for beams of circular cross-section using circular polarization.

ADD [1] This antenna pattern is used in the revision of the Regions 1 and 3 Plan for assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997.

MOD 3.8 *System noise temperature*

The satellite system noise temperature values generally used in the Plan at the 1988 Conference (WARC Orb-88) are 1 800 K for 17 GHz and 1 500 K for 14 GHz[1] . For revising the Regions 1 and 3 Plan at the 1997 World Radiocommunication Conference these values are 900 K for 17 GHz and 750 K for 14 GHz.

MOD 3.9 *Polarization*

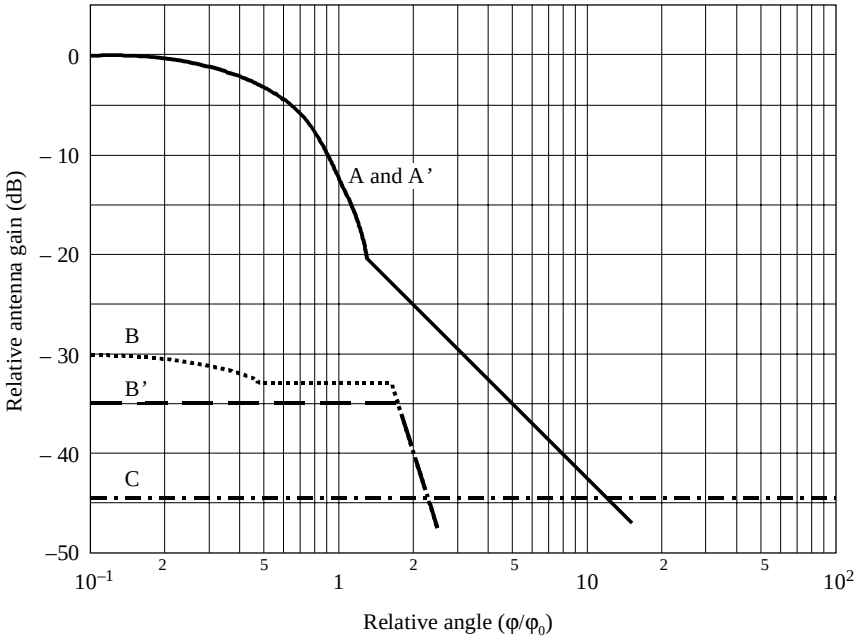
In Regions 1 and 3, circular polarization was normally used for the purpose of planning the feeder links.

For the definitions of the terms “direct and indirect polarization”, see § 3.2.3 of Annex 5 to Appendix **S30**.

For the planning of the broadcasting-satellite service, circular polarization is generally used. However, for implementation of assignments in the Regions 1 and 3 Plan, linear polarization may also be used subject to successful application of the modification procedure of Article 4. Linear polarization is defined in Recommendation ITU-R BO.1212. This Recommendation should be used when analysing linearly polarized signals.

NOC 3.10 and 3.11

ADD [1] These system temperature values are still used for assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997.



Curves A and A': WARC Orb-88 and WRC-97 co-polar
B: Warc Orb-88 cross-polar
B': WRC-97
C: Curve C (minus the on-axis gain)

AF97-07

MOD

FIGURE B

Receiving space station circularly polarized antenna co-polar and cross-polar reference patterns for elliptical beams for planning in Regions 1 and 3

Co-polar relative gain (dB):

Curve A (WARC Orb-88) and Curve A' (WRC-97)

$G = -12\,(\varphi/\varphi_0)^2$ for $0 \leq \varphi/\varphi_0 < 1.3$

$G = -17.5 - 25 \log(\varphi/\varphi_0)$ for $1.3 \leq \varphi/\varphi_0$

After intersection with Curve C, as Curve C

Cross-polar relative gain (dB):

Curve B (WARC Orb-88)	**Curve B' (WRC-97)**
$G = -30 - 12\,(\varphi/\varphi_0)^2$ for $0 \le \varphi/\varphi_0 \le 0.5$	$G = -35$ for $0 \le \varphi/\varphi_0 < 1.75$
$G = -33$ for $0.5 < \varphi/\varphi_0 \le 1.67$	$G = -40 - 40 \log \left(\frac{\varphi}{\varphi_0} - 1 \right)$ for $1.75 \le \varphi/\varphi_0$
$G = 40 - 40 \log \left(\frac{\varphi}{\varphi_0} - 1 \right)$ for $1{,}67 < \varphi/\varphi_0$	
After intersection with Curve C, as Curve C	After intersection with Curve C, as Curve C

Curve C: Minus the on-axis gain (Curve C in the above figure illustrates the particular case of an antenna with an on-axis gain of 44.44 dBi)

where:

φ = off-axis angle (degrees)

φ_0 = cross-sectional half-power beamwidth in the direction of interest (degrees).

The relationship between the maximum gain of an antenna and the half-power beamwidth can be derived from the expression in § 3.7.1 above.

NOC FIGURE C

MOD *Curve A:* Co-polar component (dB relative to main beam gain)

$-12\,(\varphi/\varphi_0)^2$ for $0 \le \varphi/\varphi_0 \le 0.5$

$-33.33\,\varphi_0^2 \left(\frac{\varphi}{\varphi_0} - x \right)^2$ for $0.5 < \varphi/\varphi_0 \le \frac{0.87}{\varphi_0} + x$

-25.23 for $\frac{0.87}{\varphi_0} + x < \varphi/\varphi_0 \le 1.45$

$-(22 + 20 \log (\varphi/\varphi_0))$ for $\varphi/\varphi_0 > 1.45$

After intersection with Curve C: as Curve C.

Curve B: Cross-polar component (dB relative to main beam gain)

-30 for $0 \leq \varphi/\varphi_0 < 2.51$

After intersection with Curve A: as Curve A.

Curve C: Minus the on-axis gain (Curves A and C represent examples for three antennas having different values of φ_0 as labelled in Figure C. The on-axis gains of these antennas are 37, 43 and 49 dBi, respectively).

where:

φ = off-axis angle (degrees);

φ_0 = dimension of the minimum ellipse fitted around the feeder-link service area in the direction of interest (degrees);

$x = 0.5\left(1 - \dfrac{0.6}{\varphi_0}\right)$

MOD 3.11.1 *Method for determination of the increase in e.i.r.p. during rain attenuation for an assignment over the Plan value*

Condition to be observed

The increase in e.i.r.p. of the assignment studied must not entail an impairment of more than 0.5 dB of the feeder-link equivalent protection margin of any other assignment of any other administration.

Calculation method

Step 1: Compile a list of all assignments of other administrations (A, B, C, . . .) in the same orbital position and positions within ± 6° (or further if no station is found within 6° arc) liable to suffer interference from the assignment studied.

Step 2: Calculate the feeder-link equivalent protection margin of assignment A in free-space conditions, taking account of all interference sources affecting A at the worst test points, namely:

- for assignment A: the point corresponding to the minimum *C/N* ratio;
- for each interference source affecting A: the point corresponding to the maximum interference power affecting A.

Step 3: Introduce for the assignment studied the rain attenuation for 0.1% of the worst month and the corresponding rain depolarization value.

Step 4: Recalculate the feeder-link equivalent protection margin of assignment A at the worst test points, namely:

- for assignment A: the test point used in *Step 2* above;
- for the assignment studied: the test point corresponding to the maximum interference power affecting A.

At this stage, the e.i.r.p. of the assignment studied is that contained in the Plan.

Step 5: Increase the e.i.r.p. of the assignment studied by 0.1 dB and recalculate the equivalent uplink margin of A as in *Step 4* above.

Step 6: Repeat the operation of *Step 5* above until the equivalent uplink margin of assignment A is impaired by more than 0.5 dB in relation to the value found under *Step 2* above, or until the e.i.r.p. increase exceeds 10 dB or the rain attenuation (see *Step 3*). Adopt the e.i.r.p. increase in the preceding iteration step.

Step 7: Repeat the operations in *Step 2* to *Step 6* above, considering the assignments B, C, . . .

Step 8: Adopt the smallest of the increases in e.i.r.p. found under *Step 6* above for the various assignments A, B, C, . . .

(MOD) 3.11.2 *Propagation model*

For the calculation of rain attenuation for 0.1% of the worst month, the model described in § 2.2 of this Annex should be used. It shall be assumed that the 0.1% value is 3.3 times the 1% value in dB.

Rain depolarization shall be calculated on the basis of attenuation, using the method described in § 2.4 of this Annex.

NOC 3.11.3

NOC FIGURE 5

MOD 3.11.4 *Procedures*

An administration wishing to introduce power control may use a value not exceeding that given in Article 9A of this Appendix or it may request, where this is possible, the use of a higher value for a given earth station location. In this latter case, it shall request the Bureau to calculate the maximum permissible value for that site. The administration shall provide the Bureau with the coordinates of the station, the proposed antenna characteristics, including the off-axis co-polar and cross-polar characteristics, and the rain climatic zone.

The Bureau shall calculate the permissible increase in power using the method described in § 3.11.1.

The Bureau shall communicate the results of the calculations to the requesting administrations as well as to those administrations whose feeder-link equivalent protection margin is reduced.

In any case, the permitted increase in e.i.r.p. above that given in the Plan shall not exceed 10 dB.

In the event of modifications to the Plan, the Bureau shall recalculate the value of power control for the assignment subject to the modification and insert the appropriate value for that assignment in the Plan. A modification to the Plan shall not require the adjustment of the values of permissible power increase of other assignments in the Plan.

SUP 3.12

NOC 3.13 and 3.14

MOD 3.15 *Orbit positions*

The Plan is generally based on the use of regular arrangements of 6° from 37° W to 29° E and from 38° E to 160° W. The orbital positions are those given in the Plan.

The Regions 1 and 3 Plan is also based on the grouping of space stations in nominal orbital positions of ± 0.2° from the centre of the cluster.

Generally, the space stations are shown in the Plan in the centre of the cluster. However, in some cases, the space stations are shown at the edge of the cluster. Administrations may locate satellites within a cluster at any orbital position within that cluster, provided they obtain the agreement of other administrations having assignments to space stations in the same cluster.

ADD 3.16 *Satellite station-keeping*

Space stations in the broadcasting-satellite service must be maintained in position with an accuracy equal to or better than $\pm 0.1^{o}$ in the E-W direction. For such space stations, the maintenance of the tolerance ±0.1° in the N-S direction is recommended but is not a requirement.

NOC 4 to 4.13.2

NOC FIGURE 9

NOC ANNEX 4

RESOLUTIONS

and

RECOMMENDATIONS

Resolutions abrogated by the 1997 World Radiocommunication Conference (WRC-97):

WARC-79:	16, 17, 32, 37, 61, 65, 315, 403, 505, 508, 640, 702
WARC Mob-83:	39, 704
WARC HFBC-87:	511, 512, 513, 514, 515, 516
WARC Mob-87:	19, 38, 200, 208, 210, 314, 316, 319, 322, 323, 330, 333, 335, 336, 409, 601
WARC Orb-88:	45, 69, 104, 106, 107, 109, 110
WARC-92:	22, 93, 94, 113, 211, 338, 410, 522, 523, 710, 711
WRC-95:	47, 48, 71, 115, 116, 117, 118, 119, 120, 529, 530, 643, 713, 714, 717, 718, 719, 720

Recommendations abrogated by the 1997 World Radiocommunication Conference (WRC-97):

WARC-79:	1, 2, 4, 5, 6, 10, 11, 13, 30, 31, 60, 62, 65, 68, 69, 72, 73, 74, 103, 304, 305, 306, 310, 403, 406, 407, 502, 505, 508, 601, 620, 704, 712
WARC HFBC-87:	509, 510, 512, 513, 514, 516
WARC Mob-87:	302, 303, 312, 317, 603, 607, 714
WARC Orb-88:	15
WARC-92:	621
WRC-95:	717, 721

RESOLUTION 1 (Rev.WRC-97)

Notification of frequency assignments

The World Radiocommunication Conference (Geneva, 1997),

referring to

– the Preamble of the Constitution,

– Article 42 of the Constitution (Special Arrangements),

– Article **S6** of the Radio Regulations (Special Agreements),

– Article **S11** of the Radio Regulations (Notification and Recording of Frequency Assignments),

– Article **S12** of the Radio Regulations (Seasonal Planning of the HF Bands Allocated to the Broadcasting Service Between 5 900 kHz and 26 100 kHz),

resolves

that, unless specifically stipulated otherwise by special arrangements communicated to the Union by administrations, any notification of a frequency assignment to a station shall be made by the administration of the country on whose territory the station is located.

RESOLUTION 13 (Rev.WRC-97)

Formation of call signs and allocation of new international series

The World Radiocommunication Conference (Geneva, 1997),

considering

the increasing demand for call signs justified by the increased number of Member States of the Union and by the increased requirements of countries which are already Member States,

believing

that call signs already in use should, as far as possible, not be changed,

noting

a) that the former call-sign series formed of three letters, or a figure and two letters, having been exhausted, a new series has been introduced formed of a letter, a figure and a letter; but in no case may the figure be 0 or 1;

b) that the method referred to in *noting a)* is not applicable to series beginning with one of the following letters: B, F, G, I, K, M, N, R, W,

resolves

1. that the Director of the Radiocommunication Bureau shall continue to urge administrations:

1.1 to make maximum use of the possibilities of the series at present allocated, in order to avoid, as far as possible, further requests;

1.2 to review the call-sign assignments they have already made from their present allocations, with a view to releasing any series and placing them at the disposal of the Union;

2. that the Director of the Radiocommunication Bureau shall, upon request, furnish advice to administrations on the means of effecting the greatest economy, which should be the rule, in the use of a series of call signs;

3. that if, nevertheless, before the next competent world radiocommunication conference, it appears that all the possibilities of the present system of forming call signs will be exhausted, the Director of the Radiocommunication Bureau shall:

3.1 explore the possibility of extending the present allocations of international call-sign series by lifting the limitation on use of the letter “Q” and the digits “0” and “1”;

3.2 issue a circular-letter:

3.2.1 explaining the position;

3.2.2 urging administrations to send in their proposals for possible solutions;

4. that, from the information thus submitted, the Director of the Radiocommunication Bureau shall prepare a report, together with his comments and suggestions, for submission to the next competent world radiocommunication conference.

RESOLUTION 26 (Rev.WRC-97)

Footnotes to the Table of Frequency Allocations in Article S5 of the Radio Regulations

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that footnotes are an integral part of the Table of Frequency Allocations in the Radio Regulations and, as such, form part of an international treaty text;

b) that footnotes to the Table of Frequency Allocations should be clear, concise and easy to understand;

c) that footnotes should relate directly to matters of frequency allocation;

d) that, in order to ensure that footnotes allow modification of the Table of Frequency Allocations without introducing unnecessary complications, principles relating to the use of footnotes are needed;

e) that, currently, footnotes are adopted by competent world radiocommunication conferences and any addition, modification or deletion of a footnote is considered and adopted by the competent conference;

f) that some problems concerning country footnotes may be resolved through the application of a special agreement envisaged by Article **S6** of the Radio Regulations;

g) that, in certain cases, administrations are confronted with major difficulties due to inconsistencies or omissions in footnotes;

h) that, in order to keep the footnotes to the Table of Frequency Allocations up to date, there should be clear and effective guidelines for additions, modifications and deletions of footnotes,

resolves

1. that, wherever possible, footnotes to the Table of Frequency Allocations should be confined to altering, limiting or otherwise changing the relevant allocations rather than dealing with the operation of stations, assignment of frequencies or other matters;

2. that the Table of Frequency Allocations should include only those footnotes which have international implications for the use of the radio-frequency spectrum;

3. that new footnotes to the Table of Frequency Allocations should only be adopted in order to:

a) achieve flexibility in the Table of Frequency Allocations;

b) protect the relevant allocations in the body of the Table and in other footnotes in accordance with Section II of Article **S5** of the Radio Regulations;

c) introduce either transitional or permanent restrictions on a new service to achieve compatibility; or

d) meet the specific requirements of a country or area when it is impracticable to satisfy such needs otherwise within the Table of Frequency Allocations;

4. that footnotes serving a common purpose should be in a common format, and, where possible, be grouped into a single footnote with appropriate references to the relevant frequency bands,

further resolves

1. that any addition of a new footnote or modification of an existing footnote should be considered by a world radiocommunication conference only when:

a) the agenda of that conference explicitly includes the frequency band to which the proposed additional or modified footnote relates; or

b) the frequency bands to which the desired additions or modifications of the footnote belong are considered during the conference and the conference decides to make a change in those bands; or

c) the addition or modification of footnotes is specifically included in the agenda of the conference as a result of the consideration of proposals submitted by one or more interested administration(s);

2. that recommended agendas for future world radiocommunication conferences should include a standing agenda item which would allow for the consideration of proposals by administrations for deletion of country footnotes, or country names in footnotes, if no longer required;

3. that in cases not covered by *further resolves* 1. and 2., proposals for new footnotes or modification of existing footnotes could exceptionally be considered by a world radiocommunication conference if they concern corrections of obvious omissions, inconsistencies, ambiguities or editorial errors and have been submitted to ITU as stipulated in No. 316 of the Convention (Geneva, 1992),

urges administrations

1. to review footnotes periodically and to propose the deletion of their country footnotes or of their country names from footnotes, as appropriate;

2. to take account of the *further resolves* above in making proposals to world radiocommunication conferences.

RESOLUTION 27 (Rev.WRC-97)

References to ITU-R and ITU-T Recommendations in the Radio Regulations

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the principles of incorporation by reference were adopted by the 1995 World Radiocommunication Conference and have been revised by this Conference (see Annex 1 to this Resolution);

b) that there are provisions of the Radio Regulations which employ mandatory incorporation by reference but fail to make explicit reference to the ITU-R or ITU-T Recommendations incorporated;

c) that the 1997 Conference Preparatory Meeting (CPM-97) for this Conference urged administrations to give further consideration to the status of material incorporated by reference:

– using the initial assessment provided by the Bureau in the CPM Report and the set of principles given in Annex 1 to this Resolution;

– noting that mandatory references shall be explicit and use the appropriate regulatory language;

– taking into account the factors set out in Annex 2 to this Resolution;

d) that the Director of the Radiocommunication Bureau has drawn up a list (see Annex 1 to the CPM Report to this Conference) of the provisions of the Radio Regulations using incorporation by reference, which provides an initial assessment of the status of each reference and forms the basis for the work on appropriate referencing, examples of which are contained in Annex 3 to this Resolution;

e) that the Radiocommunication Bureau has drawn up a list, contained in Annex 4 to this Resolution, of the ITU-R Recommendations to which explicit reference is made in the Radio Regulations,

resolves

that ITU-R and ITU-T Recommendations incorporated or proposed for incorporation by reference in the provisions of the Radio Regulations be identified and examined at the 1999 World Radiocommunication Conference (WRC-99), with a view to establishing the correct method of reference in accordance with the principles set out in Annex 1 to this Resolution and taking into account the factors listed in Annex 2 to this Resolution, in order to complete the simplification of the Radio Regulations in respect of incorporation by reference,

instructs the Director of the Radiocommunication Bureau

to arrange for a review of the provisions of the Radio Regulations containing references to ITU-R or ITU-T Recommendations and propose suitable recommendations to the CPM-99 for inclusion in its Report to WRC-99, using the list of provisions contained in Annex 3 to this Resolution together with the guidance contained in Annexes 1 and 2 to this Resolution, and taking into account the list of ITU-R Recommendations contained in Annex 4 to this Resolution,

urges administrations

to use the CPM Report to WRC-99 in order to prepare their proposals on incorporation by reference to that Conference.

ANNEX 1 TO RESOLUTION 27 (Rev.WRC-97)

Principles of incorporation by reference

1. Where references are non-mandatory, it is not necessary to establish specific conditions in applying the texts quoted. In such cases, reference could, for example, be made to "the latest version" of a Recommendation.

2. Mandatory references to Resolutions or Recommendations of a world radiocommunication conference (WRC) are acceptable without restriction, since such texts will have been agreed by a WRC.

3. Where mandatory references are suggested, and the relevant texts are brief, the referenced material should be incorporated in the body of the Radio Regulations.

4. If, on a case-by-case basis, it is decided to incorporate material by reference on a mandatory basis, then the following provisions shall apply:

4.1 the referenced text shall have the same treaty status as the Regulations themselves;

4.2 the reference must be explicit, specifying the specific part of the text (if appropriate) and the version or issue number;

4.3 the referenced text must be adopted by the Plenary of a competent WRC, but should not be part of the Final Acts;

4.4 all texts incorporated by reference must be readily available, by being published in a separate volume;

4.5 if, between WRCs, a referenced text (e.g. an ITU-R Recommendation) is updated, the reference in the Radio Regulations shall continue to apply to the original version until such time as a competent WRC agrees to incorporate the new version of the reference. The mechanism for considering such a step is given in Resolution **28 (WRC-95)**.

ANNEX 2 TO RESOLUTION 27 (Rev.WRC-97)

Factors to be considered for the further application of incorporation by reference

In reviewing the provisions of the Radio Regulations employing references to other texts, administrations and study groups should address the following factors:

1. whether each reference is mandatory, i.e. incorporated by reference, or non-mandatory;

2. whether in existing non-mandatory references, or mandatory references which are determined to be of non-mandatory character, appropriate linking language is used, e.g. the words “should” or “may”;

3. whether in existing mandatory references, or other types of reference which are determined to be of mandatory character, clear mandatory linking language is used, e.g. the word “shall”;

4. whether the incorporated ITU-R or ITU-T Recommendation(s) are explicitly identified;

5. where referenced ITU-R or ITU-T Recommendations are not explicitly identified, determine which ones should be identified;

6. whether text incorporated from ITU-R or ITU-T Recommendations should be placed directly in the Radio Regulations instead of using incorporation by reference;

7. if the ITU-R or ITU-T Recommendation to be incorporated is, as a whole, unsuitable as treaty status text, whether to limit the reference to those portions of the ITU-R or ITU-T Recommendation which are of a suitable nature or to place the mandatory portion directly in the Radio Regulations.

ANNEX 3 TO RESOLUTION 27 (Rev.WRC-97)

Provisions of the Radio Regulations referring to ITU-R and ITU-T Recommendations

A) *Provisions of Articles of the Radio Regulations (RR) referring to ITU-R and ITU-T Recommendations*

RR provision	Remark
S5.199 **S5.287** **S5.288** **S19.38** **S19.48** **S19.92** **S47.26** **S47.27** **S47.28** **S47.29** **S50.9** **S51.35** **S51.41** **S51.77** **S52.25** **S52.27** **S52.31** **S52.69** **S52.159** **S52.181** **S52.195** **S52.222.1** **S52.224** **S52.229** **S52.231** **S52.240** **S55.1** **S57.1**	The reference to an ITU-R Recommendation in this provision is of a **mandatory** character and the referenced text is **explicitly** identified. Ensure that a standard method of reference is used.

RR provision	Remark
S1.14 **S5.511A** **S52.23** **S52.235***	The reference to an ITU-R Recommendation in this provision seems to be of a **mandatory** character and the referenced text is **explicitly** identified, but a **non-standard wording** is used in this respect. There is a need to **review** these provisions with a view to using a standard wording. * The application of this provision is not mandatory but, if used, the referenced procedures are.
S3.2 **S5.138** **S5.458C** **S13.19** **S21.1** **S29.13** **S32.5** **S32.9.3** **S32.21** **S32.43** **S32.64** **S33.17** **S33.37** **S33.41** **S34.1** **S34.2** **S51.25** **S52.112** **S58.1***	The incorporation by reference of an ITU-R Recommendation or an ITU-T Recommendation* in this provision is of a **mandatory** character, but the referenced text is **not explicitly** identified. There is a need to **review** these provisions with a view to identifying the referenced text explicitly and ensure that a standard method of reference is used.

RR provision	Remark
S5.208A **S5.503A** **S16.6** **S21.2.2** **S21.4.1** **S29.12** **S32.7** **S51.71** **S52.32** **S52.63** **S52.148** **S52.152** **S52.153** **S52.234** **S54.2**[**] **S56.2**	The reference to an ITU-R Recommendation in this provision is of a **non-mandatory** character, but the referenced text is **explicitly** identified. No need for review, unless administrations wish to consider changing the character of this provision. ** Consider whether the application and use of the procedures referenced are mandatory.
S1.156 **S3.4** **S3.7** **S3.14** **S5.474** **S9.50.1** **S15.10** **S15.12.1** **S15.13.1** **S16.1** **S19.3** **S19.23** **S19.24** **S19.112*** **S19.115*** **S19.126*** **S21.6.1** **S21.12.1** **S21.16.1** **A.S22.1** **S22.22.2** **S22.26** **S30.1** **S56.7**[*]	The reference to an ITU-R Recommendation or an ITU-T Recommendation* in this provision is of a **non-mandatory** character and the referenced text is **not explicitly** identified. No need for review, unless administrations wish to consider changing the character of this provision.

RR provision	Remark
S16.2 **S19.83** **S52.149** **S52.188** **S52.192** **S52.213**	The reference to an ITU-R Recommendation in this provision is of an **undefined** character, but the referenced text is **explicitly** identified. There is a need to **review** these provisions with a view to indicating the character of the referenced text (i.e. mandatory or non-mandatory).
S1.153 **S1.167** **S26.6**	The reference to an ITU-R Recommendation in this provision is of an **undefined** character and the referenced text is **not explicitly** identified. There is a need to **review** these provisions with a view to indicating the character of the referenced text (i.e. mandatory or non-mandatory) and, if it becomes mandatory, to identify the referenced text explicitly.

B) *Parts of Appendices S1 to S18 to the Radio Regulations referring to ITU-R Recommendations and ITU-T Resolutions and Recommendations*

RR/Appendix provisions	Remark
– AP **S4**, Annex 2A, § C.11 *d)* – AP **S5**, Table S5-1, calculation method re No. **S19.17A** – AP **S5**, Annex 1, Tables 1-4	The reference to an ITU-R Recommendation in this provision is of a **mandatory** character and the referenced text is **explicitly** identified. Ensure that a standard method of reference is used.

RR/Appendix provisions	Remark
– AP **S1**, § 3.2 – AP **S5**, Table S5-1, threshold/condition re No. **S19.21** – AP **S5**, Table S5-1, calculation method re No. **S19.21** – AP **S13**, Part A5., Section I, § 1.*c)* – AP **S16***, Section III, § 5	The reference to an ITU-R Recommendation or an ITU-T Resolution or Recommendation* in this provision is of a **mandatory** character, but the referenced text is **not explicitly** identified. There is a need to **review** these provisions with a view to identifying the referenced text explicitly and to ensure that a standard method of reference is used.
– AP **S4**, Annex 2A, § C.8 – AP **S5**, Annex 1, § 1.2.1 and 1.2.3.2	The reference to an ITU-R Recommendation in this provision is of a **non-mandatory** character, but the referenced text is **explicitly** identified. No need for review, unless administrations wish to consider changing the character of this provision.
AP **S1**, § 2 AP **S2** AP **S3**, Table AP **S3**, § 12 and 13 AP **S11**, Part B, § 3. AP **S12**, § (6) AP **S13**, Part A1, § 4A AP **S13**, Part A6, Section IV, § 12	The reference to an ITU-R Recommendation in this provision is of a **non-mandatory** character and the referenced text is **not explicitly** identified. No need for review, unless administrations wish to consider changing the character of this provision.

ADD ANNEX 4 TO RESOLUTION 27 (Rev.CMR-97)

List of ITU-R Recommendations referred to in the Radio Regulations[1]

Recommendation	Title	Status[2]	Document	RR provision[3]
ITU-R M.257-3	Sequential single frequency selective-calling system for use in the maritime mobile service	NOC	1997 M Series, Part 3	**S19.38**, S19.83, **S19.92, S19.96A S52.222.1, S52.235**, S54.2, AP S13, Part A5, § 11
ITU-R SF.356-4	Maximum allowable values of interference from line-of-sight radio-relay systems in a telephone channel of a system in the fixed-satellite service employing frequency modulation, when the same frequency bands are shared by both systems	NOC	1997 SF Series	AP S7, § 2.3.1, Note 2
ITU-R SF.357-4	Maximum allowable values of interference in a telephone channel of an analogue angle-modulated radio-relay system sharing the same frequency bands as systems in the fixed-satellite service	MOD	1997 SF Series	AP S7, § 2.3.1, Note 2
ITU-R F.405-1	Pre-emphasis characteristics for frequency modulation radio-relay systems for television	NOC	1990 CCIR, Volume IX	AP S30, Annex 5, § 3.1.1

1 This list does not include ITU-R Recommendations referred to in resolutions and recommendations of world administrative radio conferences or world radiocommunication conferences.

2 Status as of date of the end of the 1997 Radiocommunication Assembly.

3 The provisions indicated in bold make reference to the listed ITU-R Recommendation in a mandatory manner, i.e. incorporated by reference.

Recommendation	Title	Status[2]	Document	RR provision[3]
ITU-R TF.460-5	Standard-frequency and time-signal emissions	MOD	1997 TF Series	**S1.14**
ITU-R S.465-5	Reference earth-station radiation pattern for use in coordination and interference assessment in the frequency range from 2 to about 30 GHz	MOD	1997 S Series	AP S30, Annex 6, § 2.1
ITU-R M.476-5	Direct-printing telegraph equipment in the maritime mobile service	NOC	1997 M Series, Part 3	**S19.83, S19.96A, S51.41**
ITU-R S.483-3	Maximum permissible level of interference in a television channel of a geostationary-satellite network in the fixed-satellite service employing frequency modulation, caused by other networks of this service	MOD	1997 S Series	AP S30, Annex 6, § 1.5, Note 5
ITU-R M.489-2	Technical characteristics of VHF radiotelephone equipment operating in the maritime mobile service in channels spaced by 25 kHz	NOC	1997 M Series, Part 3	**S51.77**, S52.182, **S52.231, AP S13, Part A2, § 10 (1) AP S18, Note *e)***
ITU-R M.492-6	Operational procedures for the use of direct-printing telegraph equipment in the maritime mobile service	NOC	1997 M Series, Part 3	**S52.27**, S56.2
ITU-R M.493-9	Digital selective calling system for use in the maritime mobile service	MOD	1997 M Series, Part 3	S54.2
ITU-R BT.500-7	Methodology for the subjective assessment of the quality of television pictures	MOD	1997 BT Series	AP S30, Annex 6, § 1.6 *b)*, footnote
ITU-R M.541-8	Operational procedures for the use of digital selective-calling (DSC) equipment in the maritime mobile service	MOD	1997 M Series, Part 3	**S51.35**, S52.148, S52.149, S52.152, S52.153, **S52.159**, S54.2

ANNEX 4 TO RESOLUTION 27 (Rev.CMR-97) (*continued*)

Recommendation	Title	Status[2]	Document	RR provision[3]
ITU-R P.618-5	Propagation data and prediction methods required for the design of Earth-space telecommunication systems	NOC	1997 P Series, Part 2	AP S30, Annex 5, § 2.1 AP S30A, Annex 3, § 2.2 and 2.4
ITU-R M.625-3	Direct-printing telegraph equipment employing automatic identification in the maritime mobile service	NOC	1997 M Series, Part 3,	S19.83, **S51.41**
ITU-R M.627-1	Technical characteristics for HF maritime radio equipment using narrow-band phase-shift keying (NBPSK) telegraphy	NOC	1997 M Series, Part 3	S19.83, **S51.41**
ITU-R SF.675-3	Calculation of the maximum power density (averaged over 4 kHz) of an angle-modulated carrier	MOD	1997 SF Series	AP S4 (§ C.8 *a)*, footnote)[4]
ITU-R M.690-1	Technical characteristics of emergency position-indicating radio beacons (EPIRBs) operating on the carrier frequencies of 121.5 MHz and 243 MHz	NOC	1997 M Series, Part 4	**AP S13, Part A5, § 1 *b)*** and **4 (2)** AP S15, Table S15-2, 121.5 MHz
ITU-R SF.765	Intersection of radio-relay antenna beams with orbits used by space stations in the fixed-satellite service	NOC	1997 SF Series	S21.22, S21.41, S29.12

[4] The reference in this provision is Recommendation ITU-R SF.675.

Recommendation	Title	Status[2]	Document	RR provision[3]
ITU-R RA.769-1	Protection criteria used for radioastronomical measurements	MOD	1997 RA Series	S5.208A, **S5.511A**, S29.12[5]
ITU-R M.821-1	Optional expansion of the digital selective calling system for use in the maritime mobile service	MOD	1997 M series, Part 3	S54.2
ITU-R M.825-2	Characteristics of a transponder system using digital selective calling techniques for use with vessel traffic services and ship-to-ship identification	MOD	1997 M Series, Part 4	S54.2
ITU-R P.837-1	Characteristics of precipitation for propagation modelling	NOC	1997 P Series, Part 1	AP S30, Annex 5, § 2.1 AP S30A, Annex 3, § 2.1
ITU-R P.838	Specific attenuation model for rain for use in prediction methods	NOC	1997 P Series, Part 1	AP S30A, Annex 3, § 2.2
ITU-R P.841	Conversion of annual statistics to worst-months statistics	NOC	1997 P Series, Part 1	AP S30A, Annex 3, § 2.2
ITU-R IS.847-1	Determination of the coordination area of an earth station operating with a geostationary space station and using the same frequency band as a system in a terrestrial service	NOC	1997 IS Series	**AP S5, Table S5-1** **AP S5, Annex 2, Tables 2** and **3**
ITU-R IS.848-1	Determination of the coordination area of a transmitting earth station using the same frequency band as receiving earth stations in bidirectionally allocated frequency bands	NOC	1997 IS Series	**AP S5, Table S5-1**

[5] The reference in these provisions is Recommendation ITU-R RA.769.

ANNEX 4 TO RESOLUTION 27 (Rev.CMR-97) (*continued*)

Recommendation	Title	Status[2]	Document	RR provision[3]
ITU-R IS.849-1	Determination of the coordination area for earth stations operating with non-geostationary spacecraft in bands shared with terrestrial services	NOC	1997 IS Series	**AP S5, Table S5-1** **AP S5, Annex 2, Tables 2** and **3**
ITU-R SA.1071	Use of the 13.75 to 14.0 GHz band by the space science services and the fixed-satellite service	NOC	1997 SA Series	S5.503A
ITU-R M.1084-2	Interim solution for improved efficiency in the use of the band 156 - 174 MHz by stations in the maritime-mobile service	MOD	1997 M Series, Part 3	**AP S18, Note *e)***
ITU-R SM.1138	Determination of necessary bandwidths including examples for their calculation and associated examples for the designation of emissions	NOC	1997 SM Series	AP S1, § 1. (2) and **2. (3.1)**
ITU-R SM.1139	International monitoring system	NOC	1997 SM Series	S16.2, S16.6
ITU-R IS.1143	System specific methodology for coordination of non-geostationary space stations (space-to-Earth) operating in the mobile-satellite service with the fixed service	NOC	1995 IS Series	AP S5, Annex 1, § 1.2.1 and 1.2.3.2
ITU-R M.1169	Hours of service of ship stations	NOC	1997 M Series, Part 3	**S47.26, S47.27, S47.28, S47.29, S50.9**
ITU-R M.1170	Morse telegraphy procedures in the maritime mobile service	NOC	1997 M Series, Part 3	S51.71, **S52.23, S52.25**, **S52.31**, S52.32, S52.63, **S52.69**, **S55.1**

Recommendation	Title	Status[2]	Document	RR provision[3]
ITU-R M.1171	Radiotelephony procedures in the maritime mobile service	NOC	1997 M Series, Part 3	S51.71, S52.192, **S52.195,** S52.213, **S52.224**, S52.234, **S52.240**, **S57.1, AP S13, Part A2, § 14A (1)**
ITU-R M.1172	Miscellaneous abbreviations and signals to be used for radio-communications in the maritime mobile service	NOC	1997 M Series, Part 3	**S19.48**, S32.7, AP S13, Part A1, § 5
ITU-R M.1173	Technical characteristics of single-sideband transmitters used in the maritime mobile service for radiotelephony in the bands between 1 606.5 kHz (1 605 kHz Region 2) and 4 000 kHz and between 4 000 kHz and 27 500 kHz	NOC	1997 M Series, Part 3	**S52.181**, **S52.229**, **AP S17, Part B, Section I § 2**, **6** ***a)*** and ***b)***
ITU-R M.1174	Characteristics of equipment used for on-board communications in the bands between 450 and 470 MHz	NOC	1997 M Series, Part 3	**S5.287, S5.288**
ITU-R M.1175	Automatic receiving equipment for radiotelegraph and radio-telephone alarm signals	NOC	1997 M Series, Part 3	**AP S13, Part A5, § 9**
ITU-R M.1185-1	Method for determining coordination distance between ground based mobile earth stations and terrestrial stations operating in the 148.0 - 149.9 MHz band	MOD	1997 M Series, Part 5	**AP S5, Annex 1, § 3.2, Table 1** Resolution 46, Annex 2, Table 1
ITU-R M.1187	A method for the calculation of the potentially affected region for a mobile-satellite service (MSS) network in the 1-3 GHz range using circular orbits	NOC	1997 M Series, Part 5	**AP S4, § C.11** ***d)***

ANNEX 4 TO RESOLUTION 27 (Rev.CMR-97) (*end*)

Recommendation	Title	Status[2]	Document	RR provision[3]
ITU-R BO.1212	Calculation of total interference between geostationary-satellite networks in the broadcasting-satellite service	NOC	1997 BO Series	AP S30, Annex 5, § 3.2.4 AP S30A, Annex 3, § 3.9
ITU-R BO.1213	Reference receiving earth station antenna patterns for replanning purposes to be used in the revision of the WARC-77 BSS plans for Regions 1 and 3	NOC	1997 BO Series	**AP S30, § 11.1** **AP S30, Annex 5, § 3.7.2**
ITU-R BO.1293	Protection masks and associated calculation methods for interference into broadcast satellite systems involving digital emissions	NOC	1997 BO Series	**AP S30, Annex 5, § 3.4** **AP S30A, Annex 3, § 3.3**
ITU-R BO.1295	Reference transmit earth station antenna off-axis e.i.r.p. patterns for planning purposes to be used in the revision of the Appendix 30A plans at 14 GHz and 17 GHz in Regions 1 and 3	NOC	1997 BO Series	**AP S30A, § 9A.1** **AP S30A, Annex 3, § 3.5.3**
ITU-R BO.1296	Reference receive space station antenna patterns for planning purposes to be used for elliptical beams in the revision of the Appendix 30A plans at 14 GHz and 17 GHz in Regions 1 and 3	NOC	1997 BO Series	**AP S30A, § 9A.1** **AP S30A, Annex 3, § 3.7.3**
ITU-R BO.1297	Protection ratios to be used for planning purposes in the revision of the Appendices 30 and 30A plans in Regions 1 and 3	NOC	1997 BO Series	**AP S30, Annex 5, § 3.4** **AP S30A, Annex 3, § 3.3**

RESOLUTION 29 (WRC-97)

Information on the occupancy by fixed and mobile services in the additional HF bands allocated by the World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (WARC-92) to the broadcasting service

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that this Conference, in response to Resolution **529 (WRC-95)**, did not recommend a date or dates by which the fixed and mobile services, in the additional HF bands allocated by Conference (WARC-92) to the broadcasting service, would no longer be protected, due to insufficient information on the current use of these bands by the fixed and mobile services;

b) that the fixed and mobile services in use in each of the above-mentioned bands shall be protected until 1 April 2007;

c) that Resolution **21 (Rev.WRC-95)** established a procedure for the transfer of the fixed and mobile service assignments in the above-mentioned bands to other appropriate frequency bands;

d) that it may be possible and desirable for the broadcasting service to use parts of the above-mentioned bands prior to 1 April 2007,

resolves to instruct the Director of the Radiocommunication Bureau

1. to present a report to the 1999 Conference Preparatory Meeting (CPM-99) and the 1999 World Radiocommunication Conference (WRC-99), providing information gathered by means of consultation with administrations, on the occupancy by fixed and mobile services in each of the additional HF bands allocated by WARC-92 to the broadcasting service;

2. to provide to CPM-99 and WRC-99 any new information with regard to possible sharing between broadcasting and other services in the HF bands, together with the information already provided to WARC-92,

urges administrations

1. to provide to the Director of the Radiocommunication Bureau the information which would permit the action in *resolves* 1. and 2. to be carried out;

2. to submit to the 2001 World Radiocommunication Conference proposals with regard to the status to be given prior to 1 April 2007 to the broadcasting service in each of the additional HF bands, or portions thereof, allocated by WARC-92 to the broadcasting service.

RESOLUTION 30 (WRC-97)

Publication of the Weekly Circular including Special Sections

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the Weekly Circular and the Special Sections, as referred to in Articles **S9** and **S11** of the Radio Regulations, are currently published on paper, microfiche and diskette;

b) that the form, content and periodicity of this publication need to be reviewed in order to improve its usability;

c) that the International Frequency List (IFL) and the database of Space Radiocommunication Stations (SRS) are published every six months and the terrestrial plans are published on a yearly basis exclusively on CD-ROM;

d) that significant improvements have been made in recent times in terms of cost reduction and availability of CD-ROM and CD-ROM readers;

e) that large amounts of data may be more readily consulted if presented in an electronic format by using software;

f) that the introduction of new technologies requires adaptation and appropriate training from a user's point of view, especially for developing countries;

g) that information in electronic format could be used to fulfil administrations' database requirements,

further considering

h) that the ITU budget makes provision for the distribution of one free copy of the Weekly Circular and the Special Sections to each administration;

i) that the use of a CD-ROM format would significantly reduce the cost of publishing and distributing the Weekly Circular;

j) that the use of electronic format is important for many administrations,

resolves

1. that the publication of the Weekly Circular and the Special Sections on paper and microfiche, as well on diskette, be migrated to a CD-ROM format, having regard to *resolves* 4. of this Resolution;

2. that this publication be fortnightly;

3. that tests should be conducted in cooperation with all administrations before introducing the CD-ROM publication replacing the Weekly Circular, including the Special Sections, published on paper, microfiche and diskette;

4. that, following the successful completion of these tests and for an introductory period of a minimum of three months ending 1 January 1999, the paper, microfiche and diskette format and the CD-ROM format should be provided in parallel;

5. that the search software to be made available on the CD-ROM should be capable of easily identifying and extracting to file Parts I, II and III of the Weekly Circular, the associated Special Sections for terrestrial and space assignments, as well as plan assignments;

6. that administrations are encouraged to discontinue usage of paper, microfiche and diskette as soon as possible and to inform the Radiocommunication Bureau accordingly,

instructs the Director of the Radiocommunication Bureau

1. to initiate the introduction of a CD-ROM format for the publication of the Weekly Circular including the Special Sections;

2. to consult with all the administrations during the testing phase of the new system;

3. to provide an index of Parts I, II, III and the Special Sections printed on paper, for those administrations requesting it;

4. to include in radiocommunication seminars appropriate training in the use of the CD-ROM format;

5. to make the data also available on TIES by remote electronic access on a subscription basis;

6. to set a reasonable price for the provision of additional copies of the CD-ROM,

further instructs the Director of the Radiocommunication Bureau

7. to consider an alternative name, if appropriate, for the Weekly Circular;

8. to report to the next world radiocommunication conference on the experience gained in the introduction of the CD-ROM format, with a view to making any necessary consequential amendments to the Radio Regulations,

requests the Secretary-General

to consider the provision of suitable software and/or hardware for the least developed countries requesting it.

RESOLUTION 33 (Rev.WRC-97)

Bringing into use of space stations in the broadcasting-satellite service, prior to the entry into force of agreements and associated plans for the broadcasting-satellite service

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that while Resolution **507** envisages plans for the broadcasting-satellite service (BSS), some administrations might nevertheless feel the need to bring stations in that service into use prior to such plans being established;

b) that administrations should, as far as possible, avoid proliferation of space stations in the BSS before such plans have been established;

c) that a space station in the BSS may cause harmful interference to terrestrial stations operating in the same frequency band, even if the latter are outside the service area of the space station;

d) that the procedures specified in Articles **S9** to **S14** and Appendix **S5** of the Radio Regulations contain provisions for coordination between stations in the BSS and terrestrial stations, between space systems in that service and space systems of other administrations;

e) that there are many existing and planned stations in the BSS not subject to agreements and associated plans that have submitted advance publication information (API) or a request for coordination under the existing Resolution **33** procedures and that some administrations are currently in coordination under these procedures;

resolves

1. that, except in those cases where agreements and associated plans for the BSS have been established and have entered into force, for satellite networks for which the API or the request for coordination has been received following 1 January 1999 the procedures of Articles **S9** to **S14** shall be applied for the coordination and notification of stations in the BSS and coordination and notification of other services in respect of that service;

2. that, except in those cases where agreements and associated plans for the BSS have been established and have entered into force, for satellite networks for which the API or the request for coordination has been received by the Bureau prior to 1 January 1999, the procedure in Sections A to C in this Resolution shall be applied;

3. that a future conference review the requirement for the procedures in this Resolution.

NOC **Section A.** to **Section C.**

RESOLUTION 46 (Rev.WRC-97)

Interim procedures for the coordination and notification of frequency assignments of satellite networks in certain space services and the other services to which certain bands are allocated[1]

The World Radiocommunication Conference (Geneva, 1997)

NOC *considering* to *invites ITU-R study groups*

(MOD) ANNEX 1 TO RESOLUTION 46 (Rev.WRC-97)

NOC **Section A.** to **Section V.**

ANNEX 2 TO RESOLUTION 46 (Rev.WRC-97)

NOC A2.1

MOD A2.1.1 *Below 1 GHz*[*]

ADD A2.1.1.1 In the bands 137-138 MHz and 400.15-401 MHz, coordination of a space station of the mobile-satellite service (space-to-Earth) with respect to terrestrial services (except aeronautical mobile (OR) service networks operated by the administrations listed in Nos. **S5.204** and **S5.206** of the Radio Regulations as of 1 November 1996) is required only if the power flux-density produced by this space station exceeds −125 dB (W/m^2/4 kHz) at the Earth's surface.

[*] These provisions apply only to the mobile-satellite service.

ADD A2.1.1.2 In the band 137-138 MHz, coordination of a space station of the mobile-satellite service (space-to-Earth) with respect to the aeronautical mobile (OR) service is required only if the power flux-density produced by this space station at the Earth's surface exceeds:

– –125 dB (W/m^2/4 kHz) for networks for which complete Appendix **3** coordination information has been received by the Bureau prior to 1 November 1996.

– –140 dB (W/m^2/4 kHz) for networks for which complete Appendix **3**/**S4** coordination information has been received by the Bureau after 1 November 1996 for the administrations referred to in § A2.1.1.1 above.

ADD A2.1.1.3 In the band 137-138 MHz, coordination is also required for a space station on a replacement satellite of a mobile-satellite service network for which complete Appendix **3** coordination information has been received by the Bureau prior to 1 November 1996 and the power flux-density exceeds –125 dB (W/m^2/4 kHz) at the Earth's surface for the administrations referred to in § A2.1.1.1 above.

NOC A2.1.2 to A2.1.2.2.2

MOD A2.1.2.2.2.1 *Characteristics of reference digital point-to-point systems*

Three different digital systems are described in the following table:

– 64 kbit/s capacity used, for example, for outside plant (individual subscriber connection);

– 2 Mbit/s capacity used, for example, for business subscriber connections for the local part of the inside plant;

– 45 Mbit/s capacity used, for example, for trunk networks.

Capacity	64 kbit/s	2 Mbit/s	45 Mbit/s
Modulation	4-PSK	8-PSK	64-QAM
Antenna gain (dB)	33	33	33
Transmit power (dBW)	7	7	1
Feeder/multiplexer loss (dB)	2	2	2
e.i.r.p. (dBW)	38	38	32
Receiver IF bandwidth (MHz)	0.032	0.7	10
Receiver noise figure (dB)	4	4.5	4
Receiver input level for a BER of 10^{-3} (dBW)	–137	–120	–106

Antenna pattern:

$$G(\varphi) = G_{max} - 2.5 \times 10^{-3} \left(\frac{D\varphi}{\lambda} \right)^2 \quad \text{for} \quad 0 < \varphi < \varphi_m$$

$$G(\varphi) = 39 - 5 \log (D/\lambda) - 2.5 \log \varphi \quad \text{for} \quad \varphi_m \leq \varphi < 48^\circ$$

$$G(\varphi) = -3 - 5 \log (D/\lambda) \quad \text{for} \quad 48^\circ \leq \varphi \leq 180^\circ$$

where:

$G(\varphi)$: gain relative to an isotropic antenna (dBi)

φ: off-axis angle (degrees)

D: antenna diameter

λ: wavelength expressed in the same unit as D

G_1: gain of the first side-lobe $= 2 + 15 \log (D/\lambda)$

(D/λ may be estimated from $20 \log (D/\lambda) \approx G_{max} - 7.7$)

G_{max}: main lobe antenna gain (dBi)

$\varphi_m = 20\ (\lambda/D) \times \sqrt{(G_{max} - G_1)}$

It should be noted that the above antenna radiation pattern corresponds to the average side-lobe pattern and it is recognized that individual side-lobes may exceed it by up to 3 dB.

MOD A2.1.2.2.2.2 *Characteristics of reference analogue point-to-point systems*

Reference circuit	12 hops with 50 km distance between stations
Antenna gain (dBi)	33
e.i.r.p. (dBW)	36
Feeder/multiplexer loss (dB)	3
Receiver noise figure (referred to input of receiver) (dB)	8
Maximum short- and long-term interference in the reference circuit: – baseband interfering signal power level not to be exceeded for more than 20% of the time – baseband interfering signal power level not to be exceeded for more than 0.01% of the time	 240 pWOp 50 000 pWOp

Antenna pattern: Use antenna pattern of § A2.1.2.2.2.1.

MOD A.2.1.2.2.2.3 *Characteristics of reference point-to-multipoint systems*

NOTE – In application of the standard computation program, the use of the point-to-multipoint reference fixed service system parameters for the 2 170-2 200 MHz band is not required.

Parameter	Central station	Outstation
Antenna type	Omni/sectoral	Dish/horn
Antenna gain (dBi)	10/13	20 (analogue) 27 (digital)
e.i.r.p. (max) (dBW): – analogue – digital	 12 24	 21 34
Noise figure (dB)	3.5	3.5
Feeder/multiplexer loss (dB)	2	2
IF bandwidth (MHz)	3.5	3.5

Antenna pattern:

For the outstation antenna pattern, the reference pattern described in § A2.1.2.2.2.1 is to be used.

The reference radiation pattern for omnidirectional or sectoral antennas is the following:

$G(\theta) = G_0 - 12\,(\theta/\varphi_3)^2$ for $0 \le \theta < \varphi_3$

$G(\theta) = G_0 - 12 - 10 \log (\theta/\varphi_3)$ for $\varphi_3 \le \theta < 90°$

where:

G_0: maximum gain in the horizontal plane (dBi)

θ: radiation angle above the horizontal plane (degrees)

φ_3 (degrees) is given by:

$$\varphi_3 = \frac{1}{\alpha^2 - 0.818}$$

where:

$$\alpha = \frac{10^{0.1G_0} + 172.4}{191}$$

NOC A2.1.2.2.3 and A2.1.2.3

MOD A2.1.2.3.1 *Method for the determination of the need for coordination between mobile-satellite service space stations (space-to-Earth) and other terrestrial services sharing the same frequency band in the 1 to 3 GHz range*

Coordination of assignments for transmitting space stations of the mobile-satellite service with respect to terrestrial services is not required if the power flux-density (pfd) produced at the Earth's surface or the fractional degradation in performance (FDP) of a station in the fixed service does not exceed the threshold values shown in the following table.

Frequency band (MHz)	Terrestrial service to be protected	Coordination threshold values				
		Geostationary space stations		Non-geostationary space stations		
		pfd (per space station) calculation factors (NOTE 2)		pfd (per space station) calculation factors (NOTE 2)		% FDP (in 1 MHz) (NOTE 1)
		P	*r* dB/degrees	*P*	*r* dB/degrees	
1 492-1 525	Analogue fixed service telephony (NOTE 5)	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	
	All other cases (NOTE 4)	–128 dB(W/m^2) in 1 MHz	0.5	–128 dB(W/m^2) in 1 MHz	0.5	25
1 525-1 530	Analogue fixed service telephony (NOTE 5)	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	
	All other cases	–128 dB(W/m^2) in 1 MHz	0.5	–128 dB(W/m^2) in 1 MHz	0.5	25
2 160-2 200 (NOTE 3)	Analogue fixed service telephony (NOTE 5)	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	–141 dB(W/m^2) in 4 kHz and –123 dB (W/m^2) in 1 MHz (NOTE 6)	0.5	
	All other cases	–128 dB(W/m^2) in 1 MHz	0.5	–123 dB(W/m^2) in 1 MHz (NOTE 6)	0.5	25

Frequency band (MHz)	Terrestrial service to be protected	Coordination threshold values				
		Geostationary space stations		Non-geostationary space stations		
		pfd (per space station) calculation factors (NOTE 2)		pfd (per space station) calculation factors (NOTE 2)		% FDP (in 1 MHz) (NOTE 1)
		P	*r* dB/degrees	*P*	*r* dB/degrees	
2 483.5-2 500	All cases	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	–144 dB(W/m^2) in 4 kHz and –126 dB(W/m^2) in 1 MHz (NOTE 7)	0.65	
2 500-2 520	Analogue fixed service telephony (NOTE 5)	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	
	All other cases	–128 dB(W/m^2) in 1 MHz	0.5	–128 dB (W/m^2) in 1 MHz	0.5	25
2 520-2 535	Analogue fixed service telephony (NOTE 5)	–154 dB(W/m^2) in 4 kHz and –136 dB(W/m^2) in 1 MHz	0.75	–146 dB(W/m^2) in 4 kHz and –128 dB(W/m^2) in 1 MHz	0.5	
	All other cases	–136 dB(W/m^2) in 1 MHz	0.75	–128 dB(W/m^2) in 1 MHz	0.5	25

NOTE 1 –The calculation of FDP is contained in § A2.1.2.2.1, using the reference fixed service parameters contained in § A2.1.2.2.2.1 and A2.1.2.2.2.3. The use of FDP threshold is limited to the case of digital fixed service systems.

NOTE 2 – The following formula should be used for deriving the coordination threshold in terms of pfd:

P	for	$0° \le \delta \le 5°$
$P + r\,(\delta - 5)$	for	$5° < \delta \le 25°$
$P + 20\,r$	for	$25° < \delta \le 90°$

where δ is the angle of arrival (degrees).

The threshold values are obtained under assumed free-space propagation conditions.

NOTE 3 – The coordination thresholds in the band 2 160-2 270 MHz (Region 2) and 2 170-2 200 MHz (all Regions) to protect other terrestrial services do not apply to International Mobile Telecommunications-2000 (IMT-2000) systems, as the satellite and the terrestrial components are not intended to operate in the same area or on common frequencies within these bands.

NOTE 4 – Exceptions for the band 1 492-1 525 MHz are as follows:

4.1 For the land mobile service on the territory of Japan (No. **S5.348A** of the Radio Regulations): –150 dB(W/m^2) in 4 kHz at all angles of arrival is applicable to all satellite space-to-Earth emissions.

4.2 For the aeronautical mobile service for telemetry (No. **S5.343** of the Radio Regulations), the requirement for coordination is determined by frequency overlap (No. **S5.348** of the Radio Regulations).

NOTE 5 – In all cases involving sharing with analogue systems for telephony in the fixed service, further coordination is only required when the power flux-density values are greater than or equal to the coordination threshold values in both reference bandwidths.

NOTE 6 – The power flux-density values specified for the band 2 160-2 200 MHz provide full protection for analogue radio-relay systems using the sharing criteria established by Recommendation ITU-R SF.357, for operation with a non-geostationary mobile-satellite service system employing narrow-band time division multiple access/frequency division multiple access techniques.

NOTE 7 – The power flux-density values specified for the band 2 483.5-2 500 MHz provide full protection for analogue radio-relay systems using the sharing criteria established by Recommendation ITU-R SF.357, for operation with multiple non-geostationary mobile-satellite service systems employing code division multiple access techniques. The power flux-density values specified will not provide full protection for existing digital fixed systems in all cases. However, these power flux-density values are considered to provide adequate protection for digital fixed systems designed to operate in this band, where high-power industrial, scientific and medical equipment and possible low-power applications are expected to produce a relatively high interference environment.

NOC A2.1.2.3.2 to A2.2

MOD A2.2.1 *Sharing between feeder links of the non-geostationary mobile-satellite service (space-to-Earth) and terrestrial services in the same frequency bands*

The power flux-density at the Earth's surface produced by space stations of the fixed-satellite service operating in the space-to-Earth direction in the band 5 150-5 216 MHz shall in no case exceed –164 dB(W/m^2) in any 4 kHz band for all angles of arrival.

Emissions from a non-geostationary space station shall not exceed the following limits at the Earth's surface:

Frequency bands	Service	Limit in dB(W/m^2) for angle of arrival (δ) above the horizontal plane			Reference bandwidth
		0° - 5°	5° - 25°	25° - 90°	
6 700-6 825 MHz	Fixed-satellite (space-to-Earth)	–137	–137 + 0.5 (δ – 5)	–127	1 MHz
6 825-7 075 MHz	Fixed-satellite (space-to-Earth)	–154 and –134	–154 + 0.5 (δ – 5) and –134 + 0.5 (δ – 5)	–144 and –124	4 kHz 1 MHz
15.43-15.63 GHz	Fixed-satellite (space-to-Earth)	–127	5°-20°: –127 20°-25°: –127 + 0.56 (δ – 20)^2	25°-29°: –113 29°-31°: –136.9 + 25 log (δ – 20) 31°-90°: –111	1 MHz

Power flux-density limits between 17.7 GHz and 27.5 GHz.

The power flux-density at the Earth's surface produced by emissions from a space station, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall not exceed the following values:

–115 dB(W/m^2) in any 1 MHz band for angles of arrival between 0º and 5º above the horizontal plane;

–115 + 0.5(δ – 5) dB(W/m^2) in any 1 MHz band for angles of arrival δ between 5º and 25º above the horizontal plane;

–105 dB(W/m^2) in any 1 MHz band for angles of arrival between 25º and 90º above the horizontal plane.

These limits relate to the power flux-density which would be obtained under assumed free-space propagation conditions.

NOC A2.2.2

MOD A2.2.3 *Power flux-density limits produced by the non-geostationary fixed-satellite service in the 20-30 GHz band*

The power flux-density at the Earth's surface produced by emissions from a space station shall not exceed the following values:

–115 dB(W/m^2) in any 1 MHz band for angles of arrival between 0º and 5º above the horizontal plane;

–115 + 0.5(δ – 5) dB(W/m^2) in any 1 MHz band for angles of arrival δ between 5º and 25º above the horizontal plane;

–105 dB(W/m^2) in any 1 MHz band for angles of arrival between 25º and 90º above the horizontal plane.

However, the following values shall apply provisionally to emissions of space stations on non-geostationary satellites in networks operating with a large number of satellites, that is systems with more than 100 satellites (see Resolution **131 (WRC-97)**):

–125 dB(W/m^2) in any 1 MHz band for angles of arrival between 0º and 5º above the horizontal plane;

–125 + (δ – 5) dB(W/m^2) in any 1 MHz band for angles of arrival δ between 5º and 25º above the horizontal plane;

–105 dB(W/m^2) in any 1 MHz band for angles of arrival between 25º and 90º above the horizontal plane.

These limits relate to the power flux-density which could be obtained under assumed free-space propagation conditions.

NOC A2.2.4 to A2.3.1

MOD A2.3.2 *General considerations*

Two types of coordination distances are specified in Tables 1-4:

– predetermined distances;

– distances that are to be calculated on a case-by-case basis, taking into account specific parameters of the earth station for which the coordination area is being determined.

Neither of these distances indicate required separation distances.

It must be emphasized that the presence or installation of another station within the coordination area of an earth station would not necessarily preclude the satisfactory operation of either the earth station or the other station, since coordination distances are based on the most unfavourable case assumptions as regards interference.

The different coordination distances may be reviewed at a future conference conforming to the relevant Resolution.

MOD

TABLE 1

Earth stations operating at frequencies below 1 GHz

Frequency sharing situation		Coordination distance (In sharing situations involving services allocated with equal rights)
Frequency band and earth station for which coordination area is determined	Other service or station	
148-149.9 MHz ground-based (mobile)	Ground-based stations	As determined using Equation (1) and Figure 1 of Recommendation ITU-R M.1185 In this case, the coordination distance is calculated by the administration of the terrestrial station using the parameters of its terrestrial stations and the most up-to-date relevant parameters published by the Bureau for the earth station.
149.9-150.05 MHz ground-based (mobile) 399.9-400.05 MHz ground-based (mobile)	Radionavigation-satellite service	The coordination distance is calculated by the administration of the mobile-satellite service earth station using the parameters of its earth stations and the most up-to-date relevant parameters published by the Bureau for the radionavigation-satellite service earth station

TABLE 1 (*end*)

Frequency sharing situation		Coordination distance (In sharing situations involving services allocated with equal rights)
Frequency band and earth station for which coordination area is determined	Other service or station	
400.15-401 MHz ground-based	Meteorological aids (radiosonde)	580 km
All bands below 1 GHz ground-based	Mobile (aircraft)	500 km
All bands below 1 GHz aircraft (mobile)	Ground-based stations	500 km
400.15-401 MHz aircraft (mobile)	Meteorological aids (radiosonde)	1 080 km
All bands below 1 GHz aircraft (mobile)	Mobile (aircraft)	1 000 km
454-456 MHz 459-460 MHz ground-based	Ground-based stations	500 km

TABLE 2

Earth stations operating at frequencies in the 1-3 GHz range

Frequency sharing situation		Coordination distance (In sharing situations involving services allocated with equal rights)
Frequency band and earth station for which coordination area is determined	Other service or station (station in terrestrial service or earth station)	
Ground-based mobile (NOTE 1) (GSO network)	Ground-based stations in terrestrial services	Determined using Recommendation ITU-R IS.847 with the parameters specified therein for terrestrial stations and all applicable equations and figures
Ground-based mobile (NOTE 1) (non-GSO network)	Ground-based stations in terrestrial services	The methodology of Recommendation ITU-R IS.849 is applied in conjunction with Recommendation ITU-R IS.847 (see above)
1 675-1 700 MHz ground-based mobile	Meteorological aids (radiosonde)	580 km
All bands 1-3 GHz ground-based mobile	Terrestrial mobile (aircraft)	500 km
All bands aircraft (mobile)	Ground-based stations in terrestrial services	500 km
1 675-1 700 MHz aircraft (mobile)	Meteorological aids (radiosonde)	1 080 km
All bands aircraft (mobile)	Terrestrial mobile (aircraft)	1 000 km

NOTE 1 – Recommendation ITU-R IS.847 supplies the necessary terrestrial station parameters for the bands 1 492-1 530 MHz, 1 555-1 559 MHz, 1 610-1 645.5 MHz, 1 646.5-1 660 MHz, 1 675-1 710 MHz, 1 980-2 025 MHz, 2 160-2 200 MHz, 2 483.5-2 520 MHz, and 2 655-2 690 MHz.

NOC TABLE 3

NOC TABLE 4

RESOLUTION 49 (WRC-97)

Administrative due diligence applicable to some satellite communication services

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that Resolution 18 of the ITU Plenipotentiary Conference (Kyoto, 1994) instructed the Director of the Radiocommunication Bureau to initiate a review of some important issues concerning international satellite network coordination and make a preliminary report to the 1995 World Radiocommunication Conference (WRC-95) and a final report to this Conference;

b) that the Director of the Radiocommunication Bureau provided a comprehensive report to this Conference including a number of recommendations for action as soon as possible and identifying areas requiring further study;

c) that one of the recommendations in the Director's report was that administrative due diligence should be adopted as a means of addressing the problem of reservation of orbit and spectrum capacity without actual use;

d) that experience may need to be gained in the application of the administrative due diligence procedures adopted by this Conference, and that several years may be needed to see whether administrative due diligence measures produce satisfactory results;

e) that new regulatory approaches may need to be carefully considered in order to avoid adverse effects on networks already going through the different phases of the procedures;

f) that Article 44 of the Constitution (Geneva, 1992) sets out the basic principles for the use of the radio-frequency spectrum and the geostationary-satellite orbit, taking into account the needs of developing countries,

considering further

that this Conference has decided to reduce the regulatory time-frame for bringing a satellite network into use,

resolves

1. that the administrative due diligence procedure contained in Annex 1 to this Resolution shall be applied as from 22 November 1997 for a satellite network or satellite system of the fixed-satellite service, mobile-satellite service or broadcasting-satellite service for which the advance publication information under No. **S9.2B** of the Radio Regulations, or for which the request for modifications of the Plans under Article 4, § 4.1 *b)* of Appendices **30** and **30A** to the Radio Regulations that involve the addition of new frequencies or orbit positions, or for which the request for modifications of the Plans under Article 4, § 4.1 *a)* of Appendices **30** and **30A** that extends the service area to another country or countries in addition to the existing service area, or for which the submission of information of Annex 2 of Appendix **30B** under supplementary provisions applicable to additional uses in the planned bands as defined in Article 2 of that Appendix (Section III of Article 6 of Appendix **30B**) has been received by the Bureau from 22 November 1997;

2. that for a satellite network or satellite system within the scope of § 1., 2. or 3. of Annex 1 to this Resolution not yet recorded in the Master International Frequency Register (MIFR), for which the advance publication information under No. **1042** of the Radio Regulations or the request for a modification to the Plans of Appendices **30** and **30A** or for the application of Section III of Article 6 of Appendix **30B** has been received by the Bureau before 22 November 1997, the responsible administration shall submit to the Bureau the complete due diligence information in accordance with Annex 2 to this Resolution not later than 21 November 2003, or before the expiry of the notified period for bringing the satellite network into use, plus any extension period which shall not exceed three years pursuant to the application of No. **1550** of the Radio Regulations or the dates specified in the relevant provisions

of Appendix **30** (§ 4.3.5), Appendix **30A** (§ 4.2.5 and 4.2.6) or Appendix **30B** (§ 6.57), whichever date comes earlier. If the date of bringing into use, including extension specified above, is before 1 July 1998, the responsible administration shall submit to the Bureau the complete due diligence information in accordance with Annex 2 to this Resolution not later than 1 July 1998;

3. that for a satellite network or satellite system within the scope of § 1., 2. or 3. of Annex 1 to this Resolution recorded in the MIFR, the responsible administration shall submit to the Bureau the complete due diligence information in accordance with Annex 2 to this Resolution not later than 21 November 2000;

4. that six months before the expiry date specified in *resolves* 2. or 3. above, if the responsible administration has not submitted the due diligence information, the Bureau shall send a reminder to that administration;

5. that if the due diligence information is found to be incomplete, the Bureau shall immediately request the administration to submit the missing information. In any case, the complete due diligence information shall be received by the Bureau before the expiry date specified in *resolves* 2. or 3. above, as appropriate, and shall be published by the Bureau in the Weekly Circular;

6. that if the complete due diligence information is not received by the Bureau before the expiry date specified in *resolves* 2. or 3. above, the request for coordination or request for a modification to the Plans of Appendices **30** and **30A** or for application of Section III of Article 6 of Appendix **30B** as covered by *resolves* 1. above submitted to the Bureau shall be cancelled. Any modifications of the Plans (Appendices **30** and **30A**) shall lapse and any recording in the MIFR as well as recordings in the Appendix **30B** List shall be deleted by the Bureau after it has informed the concerned administration. The Bureau shall publish this information in the Weekly Circular,

further resolves

that the procedures in this Resolution are in addition to the provisions under Article **S9** or **S11** of the Radio Regulations or Appendices **30, 30A** or **30B**, as applicable, and, in particular, do not affect the requirement to

coordinate under those provisions (Appendices **30, 30A**) in respect of extending the service area to another country or countries in addition to the existing service area,

instructs the Director of the Radiocommunication Bureau

to report to the 1999 World Radiocommunication Conference (WRC-99) and future competent world radiocommunication conferences on the results of the implementation of the administrative due diligence procedure,

instructs the Secretary-General

to bring this Resolution to the attention of the 1998 Plenipotentiary Conference.

ANNEX 1 TO RESOLUTION 49 (WRC-97)

1. Any satellite network or satellite system of the fixed-satellite service, mobile-satellite service or broadcasting-satellite service with frequency assignments that are subject to coordination under Nos. **S9.7**, **S9.8**, **S9.9**, **S9.11**, **S9.12** and **S9.13** of the Radio Regulations, Resolution **33 (Rev.WRC-97)**, and Resolution **46 (Rev.WRC-97)**shall be subject to these procedures.

2. Any modifications of the Plans under Article 4, § 4.1 *b)* of Appendices **30** and **30A** that involve the addition of new frequencies or orbit positions or modifications of the Plans under Article 4, § 4.1 *a)* of Appendices **30** and **30A** that extend the service area to another country or countries in addition to the existing service area shall be subject to these procedures.

3. Any submission of information under Annex 2 of Appendix **30B** under supplementary provisions applicable to additional uses in the planned bands as defined in Article 2 of that Appendix (Section III of Article 6 of Appendix **30B**) shall be subject to these procedures.

4. An administration requesting coordination for a satellite network under § 1. above shall send to the Bureau as early as possible before bringing into use, but in any case to be received before the end of the 5-year period established as a limit to bringing into use in No. **S9.1** of the Radio Regulations, the due diligence information relating to the identity of the satellite network and the spacecraft manufacturer specified in Annex 2 to this Resolution.

5. An administration requesting a modification of the Plans of Appendices **30** and **30A** under § 2. above shall send to the Bureau as early as possible before bringing into use, but in any case to be received before the end of the period established as a limit to bringing into use in accordance with Appendix **30**, § 4.3.5, and with Appendix **30A**, § 4.2.5 and 4.2.6, the due diligence information relating to the identity of the satellite network and the spacecraft manufacturer specified in Annex 2 to this Resolution.

6. An administration applying Section III of Article 6 of Appendix **30B** relating to additional uses under § 3. above shall send to the Bureau as early as possible before the bringing into use, but in any case so as to be received before the bringing into use, the due diligence information relating to the identity of the satellite network and the spacecraft manufacturer specified in Annex 2 to this Resolution.

7. The information to be submitted in accordance with § 4., 5. or 6. above shall be signed by an authorized official of the notifying administration or of an administration that is acting on behalf of a group of named administrations.

8. On receipt of the due diligence information under § 4., 5. or 6. above, the Bureau shall promptly examine that information for completeness. If the information is found to be complete, the Bureau shall publish the complete information in a special section of the Weekly Circular within 30 days.

9. If the information is found to be incomplete, the Bureau shall immediately request the administration to submit the missing information. In all cases, the complete due diligence information shall be received by the Bureau within the appropriate time period specified in § 4., 5. or 6. above, as the case may be, relating to the date of bringing the satellite network into use.

10. Six months before expiry of the period specified in § 4., 5. or 6. above and if the administration responsible for the satellite network has not submitted the due diligence information under § 4., 5. or 6. above, the Bureau shall send a reminder to the responsible administration.

11. If the complete due diligence information is not received by the Bureau within the time limits specified in this Resolution, the networks covered by § 1., 2. or 3. above shall no longer be taken into account and shall not be recorded in the MIFR. The provisional recording in the MIFR shall be deleted by the Bureau after it has informed the concerned administration. The Bureau shall publish this information in the Weekly Circular.

With respect to the request for modification of the Plans of Appendices **30** and **30A** under § 2. above, the modification shall lapse if the due diligence information is not submitted in accordance with this Resolution.

With respect to the request for application of Section III of Article 6 of Appendix **30B** under § 3. above, the network shall also be deleted from the Appendix **30B** List, if applicable.

12. Before the Bureau extends the date of bringing into use under No. **S11.44** of the Radio Regulations, the complete due diligence information under § 4. above shall have been submitted by the responsible administration.

13. An administration notifying a satellite network under § 1., 2. or 3. above for recording in the MIFR shall send to the Bureau as early as possible before bringing into use, but in any case before the date of bringing into use, the due diligence information relating to the identity of the satellite network and the launch services provider specified in Annex 2 to this Resolution.

14. When an administration has completely fulfilled the due diligence procedure but has not completed coordination, this does not preclude the application of No. **S11.41** of the Radio Regulations by that administration.

ANNEX 2 TO RESOLUTION 49 (WRC-97)

A. *Identity of the satellite network*

a) Identity of the satellite network

b) Name of the administration

c) Country symbol

d) Reference to the advance publication information or to the request for modification of the Plans in Appendices **30** and **30A**

e) Reference to the request for coordination (not applicable for Appendices **30** and **30A**)

f) Frequency band(s)

g) Name of the operator

h) Name of the satellite

i) Orbital characteristics

B. *Spacecraft manufacturer*[*]

a) Name of the spacecraft manufacturer

b) Date of execution of the contract

c) Contractual “delivery window”

d) Number of satellites procured

---

[*] NOTE - In cases where a contract for satellite procurement covers more than one satellite, the relevant information shall be submitted for each satellite.

C. *Launch services provider*

a) Name of the launch vehicle provider

b) Date of execution of the contract

c) Anticipated launch or in-orbit delivery window

d) Name of the launch vehicle

e) Name and location of the launch facility

RESOLUTION 50 (WRC-97)

Interval between world radiocommunication conferences

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the Additional Plenipotentiary Conference (Geneva, 1992) concluded that, in general, world radiocommunication conferences should be held every two years in order for ITU to close the widening gap between its Radio Regulations and the current radiocommunication environment;

b) that No. 90 of the ITU Constitution states that world radiocommunication conferences shall normally be convened every two years; however, following the application of the relevant provisions of the Convention, such a conference need not be convened or an additional one may be convened;

c) that serious concerns were expressed at this Conference about the extent of the agendas of the forthcoming world radiocommunication conferences, the limited time available for their preparation and the tendency to reconsider major issues at a subsequent conference,

recognizing

a) the argument that extending the interval between world radiocommunication conferences to two and a half or three years would increase the time available for preparatory studies by Member States, Sector Members and the Radiocommunication Bureau;

b) the counter-argument that efforts should be focused on establishing realistic and manageable agendas, rather than on extending the interval between conferences;

c) the strategies enunciated in contributions to this Conference for limiting conference agendas to items requiring urgent regulatory action for which the necessary technical preparatory work can be completed;

d) the further view that, if it is determined during the course of preparations for any given conference that preparatory studies related to a particular agenda item are not sufficiently mature to lead to substantive results, action on that item could include possible deferral until the following conference,

noting

that a decision to change the interval between world radiocommunication conferences will need to be based on a thorough analysis of the impact of such a change on the future financial plans of the Union and on the extent of the resources available to the secretariat to support such conferences,

resolves to invite

1. the ITU Council, at its 1998 session, on the basis of information provided by the Radiocommunication Bureau and the General Secretariat and taking into account the views of the relevant organs of the Union, to undertake an analysis as outlined under *noting* above, with a view to recommending a definitive course of action to the 1998 Plenipotentiary Conference on the feasibility of extending the interval between world radiocommunication conferences;

2. the 1998 Plenipotentiary Conference to determine an appropriate strategy and indicate in its decision whether changes to the Constitution and Convention will be required;

3. the 1998 Plenipotentiary Conference also to consider the feasibility of scheduling conferences in the future on a single theme or a limited number of themes,

invites the Secretary-General

to include this issue, as a matter of urgency, on the agenda of 1998 session of the ITU Council.

RESOLUTION 51 (WRC-97)

Provisional application of certain provisions of the Radio Regulations as modified by the World Radiocommunication Conference (Geneva, 1997) and transitional arrangements

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that as a result of the review under Resolution 18 (Kyoto, 1994), a number of provisions relating to the advance publication, coordination and notification of assignments for satellite networks have been modified and these should be applied provisionally as soon as possible;

b) that it was decided to reduce the regulatory time-frame for bringing a satellite network into use, and to delete the advance publication information (API) if not followed by the coordination data within 24 months of the date of receipt of the API;

c) that there are a number of satellite networks for which the relevant information has been communicated to ITU prior to the end of this Conference, and it is necessary to provide for some transitional measures for the treatment of this information by the Bureau,

resolves

1. that the provisions of Sections I, IA and IB of Article **S9** and provisions of Article **S11** (Nos. **S11.43A**, **S11.44**, **S11.44B** to **S11.44I, S11.47** and **S11.48**) of the Radio Regulations, as revised by this Conference, shall be applied by the Radiocommunication Bureau and by administrations on a provisional basis as of 22 November 1997;

2. that, for satellite networks which are subject to coordination for which the API has been received by the Bureau prior to 22 November 1997 but the coordination data has not been received by the Bureau prior to this date, the

responsible administration shall have until 22 November 1999 or the end of the period pursuant to the application of No. **1056A** of the Radio Regulations, whichever date comes earlier, to submit the coordination data in accordance with the applicable provisions of the Radio Regulations; otherwise the Bureau shall cancel the relevant API in accordance with No. **1056A** or No. **S9.5D** of the Radio Regulations as applicable;

3. that, for satellite networks for which the API has been received by the Bureau prior to 22 November 1997, the maximum allowed time period from the date of receipt of the API to bring the relevant frequency assignments into use shall be six years plus the extension pursuant to No. **1550** of the Radio Regulations (see also Resolution **49 (WRC-97)**);

4. that the revised Appendix **S4** to the Radio Regulations with respect to the API for satellite networks which are subject to coordination under Section II of Article **S9** shall be applied as of 22 November 1997;

5. that, for those networks which are subject to coordination for which the API has been received but not yet published prior to 22 November 1997, the Bureau shall publish only the information of the revised Appendix **S4** as modified by this Conference.

RESOLUTION 52 (WRC-97)

Provisional application of Nos. S11.24 and S11.26 of the Radio Regulations adopted by the World Radiocommunication Conference (Geneva, 1997) with regard to high altitude platform stations

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that this Conference has made provision for the operation of high altitude platform stations within the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz;

b) that the Radio Regulations Board issued a provisional rule of procedure concerning notification periods in No. **1228/S11.24** of the Radio Regulations in February 1997, pending a final decision by this Conference;

c) that this Conference modified No. **S11.24** and added No. **S11.26** of the Radio Regulations to the effect that notices relating to assignments for high altitude platform stations in the bands 47.2-47.5 GHz and 47.9-48.2 GHz "shall reach the Bureau not earlier than five years before the assignments are brought into use";

d) that Resolution **122 (WRC-97)** gives the Bureau instructions concerning the treatment of notices for high altitude platform stations as from 22 November 1997,

resolves

that the provisions of Article **S11** (Nos. **S11.24** and **S11.26**) of the Radio Regulations shall be applied by the Radiocommunication Bureau and by administrations on a provisional basis from 22 November 1997.

RESOLUTION 53 (WRC-97)

Updating of the "Remarks" columns in the tables of Article 9A of Appendix S30A and Article 11 of Appendix S30 to the Radio Regulations

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that this Conference has adopted new texts relating to the symbols in the "Remarks" columns of Article 9A of Appendix **S30A** and Article 11 of Appendix **S30** to the Radio Regulations;

b) that this Conference has adopted new entries in the "Remarks" columns of Article 9A of Appendix **S30A** and Article 11 of Appendix **S30**, on the understanding that the lists of identified administrations will be reviewed and revised, as appropriate, by the 1999 World Radiocommunication Conference (WRC-99);

c) that studies of compatibility between the revised Regions 1 and 3 broadcasting-satellite service (downlink and feeder link) Plans, and other services having allocations in the planned bands in all three Regions, and between the revised Regions 1 and 3 Plans and the Region 2 Plans, were performed during this Conference using data which had been received and published by the Bureau at the time of this Conference under relevant provisions of the Radio Regulations;

d) that it was not possible to analyse fully the effect of all assignments which were received before 27 October 1997 but which had not been processed at the time of this Conference;

e) that in order to analyse fully the effect of assignments that have not been fully processed, it is necessary to process the assignments which were received prior to this Conference,

recognizing

a) that the revised Regions 1 and 3 Plans must be compatible with the Region 2 Plans and with the other services which have primary allocations in the planned bands in all three Regions in accordance with principles adopted at this Conference;

b) that the Radiocommunication Bureau requires clear instructions from this Conference on how to complete the analyses and to finalize the entries to be included in the "Remarks" column of both Article 9A of Appendix **S30A** and Article 11 of Appendix **S30**;

c) that the instructions to the Bureau shall take effect on 22 November 1997,

resolves

1. that the Radiocommunication Bureau shall complete the required analyses based on the new Notes (3 to 7) to § 9A.2 of Article 9A of Appendix **S30A** and Notes (5 to 7) to § 11.2 of Article 11 of Appendix **S30** added during this Conference;

2. that the Radiocommunication Bureau shall publish the results of its analyses after this Conference, together with a modified "Remarks" column of Article 9A of Appendix **S30A** and Article 11 of Appendix **S30**, in the form of a circular-letter;

3. that once the circular-letter referred to in *resolves* 2. has been sent, administrations will have a period of 60 days to decide whether they do or do not wish to go on appearing as "affected administrations" in the relevant table. If no reply is received from administrations within that period, it will be taken that there is no need to make any change;

4. that the new coordination requirements identified in the above-mentioned circular-letter shall apply provisionally from the date of the above-mentioned circular-letter until a decision is taken by WRC-99;

5. that the Radiocommunication Bureau shall report the results of its analyses and the final lists of administrations to be included in the modified "Remarks" columns to WRC-99,

instructs the Secretary-General

to bring this Resolution to the attention of the Council, at its next session, with a view to including this item on the agenda of WRC-99.

RESOLUTION 54 (WRC-97)

Implementation of Resolution 46 (Rev.WRC-97)

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that this Conference has modified Resolution **46**;

b) that the revised version of Resolution **46** is referred to in several footnotes in the Table of Frequency Allocations of the Radio Regulations that have been modified by this Conference;

c) that these footnotes shall apply provisionally only as from 1 January 1999;

d) that some administrations have expressed the wish to start the coordination procedure contained in Resolution **46** (**Rev.WRC-97**) as soon as possible following this Conference,

considering further

that some administrations have already submitted information on projected networks,

instructs the Radiocommunication Bureau

to apply, as of 22 November 1997, the provisions of Resolution **46** (**Rev.WRC-97**) to those bands in which the Resolution is mentioned.

RESOLUTION 72 (WRC-97)

Regional preparations for world radiocommunication conferences

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that many regional telecommunication organizations have coordinated their preparations for this Conference;

b) that a number of common proposals have been submitted to this Conference from administrations participating in the preparations of regional telecommunication organizations;

c) that this consolidation of views at regional level, together with the opportunity for interregional discussions prior to the Conference, has eased the task of reaching a consensus during the Conference;

d) that the burden of preparation for future conferences is likely to increase;

e) that there is consequently great benefit to the Members of the Union of coordination of preparations at regional level;

f) that the success of future conferences will depend on greater efficiency of regional coordination and interaction at interregional level prior to future conferences;

g) that some regional organizations lack the necessary resources to adequately organize and to participate in such preparations;

h) that there is a need for overall coordination of the interregional consultations,

noting

a) that at the World Telecommunication Development Conference (Buenos Aires, 1994) many regional telecommunication organizations expressed the need for the Union to cooperate more closely with regional telecommunication organizations;

b) that consequently the Plenipotentiary Conference (Kyoto, 1994) resolved that the Union should develop stronger relations with regional telecommunication organizations,

further noting

that in some regions the relationship with the ITU-R regional offices has proved to be of great benefit,

resolves to instruct the Director of the Radiocommunication Bureau

a) to consult the regional telecommunication organizations on the means by which assistance can be given to their preparations for future world radiocommunication conferences in the following areas:

– organization of regional preparatory meetings;

– information sessions;

– development of coordination methods;

– identification of major issues;

– facilitation of regional and interregional meetings;

– convergence of interregional views on major issues;

b) to submit a report on the results of the consultation to the Plenipotenti Conference for consideration,

invites the Plenipotentiary Conference

to consider the report submitted by the Directors of BR and BDT and take appropriate measures to provide the necessary resources for BR and BDT to provide the necessary assistance to regional telecommunication organizations in the preparations for world radiocommunication conferences.

RESOLUTION 73 (WRC-97)

Measures to solve the incompatibility between the broadcasting-satellite service in Region 1 and the fixed-satellite service in Region 3 in the frequency band 12.2-12.5 GHz

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the band 12.2-12.5 GHz is allocated on a primary basis to the broadcasting-satellite service (BSS) in Region 1 and the fixed-satellite service (FSS) in Region 3;

b) that both services should have equitable access to the orbit and spectrum;

c) that at present, the procedures of Appendix **30** to the Radio Regulations applicable to the FSS in Region 3 in respect of the BSS Plan in Region 1 are such that only the Plan assignments are protected, so that it could lead to situations where an FSS system could receive interference from a BSS system, or vice versa, but for which currently there are no regulatory provisions which require any type of coordination procedure to be undertaken;

d) that several modifications to the Regions 1 and 3 BSS Plan, which have assignments in the band 12.2-12.5 GHz, have entered into the Plan by successfully applying the current Article 4 of Appendix **30** procedure, or are still applying the current Article 4 of Appendix **30** modification procedure. Some of these assignments have already been brought into use;

e) that some Region 3 FSS systems are currently operating, or are under coordination, applying relevant provisions of the Radio Regulations,

resolves

1. that the Radiocommunication Bureau shall apply the criteria of Annex 4 to Appendix **30** to identify:

– the BSS assignments in the 12.2-12.5 GHz frequency band, submitted under paragraphs 4.1 *a)* or 4.1 *b)* of Article 4 of Appendix **30**, for which complete Annex 2 information has been received by the Bureau before 27 October 1997 and which are affected by Region 3 FSS networks for which complete Appendix **3** or Appendix **S4** information, submitted under § 7.2.1 of Article 7 of Appendix **30**, has been received by the Bureau after the date of receipt of the above-mentioned Annex 2 information for BSS and before these modifications and additions have been included in the Regions 1 and 3 BSS Plan;

– the Radiocommunication Bureau shall also identify the administrations whose assignments affect these BSS assignments in the 12.2-12.5 GHz frequency band;

2. that the Radiocommunication Bureau shall apply the criteria of Annex 1 to Appendix **30** and relevant Rules of Procedure to identify:

– the Region 3 FSS networks in the frequency band 12.2-12.5 GHz for which complete Appendix **3** or Appendix **S4** information, submitted under § 7.2.1 of Article 7 of Appendix **30**, has been received by the Bureau before 27 October 1997 and which are affected by BSS assignments in the frequency band 12.2-12.5 GHz, submitted under § 4.1 *a)* or 4.1 *b)* of Article 4 of the same Appendix, for which complete Annex 2 information has been received by the Bureau prior to the date of the receipt of the above-mentioned Appendix **3** or Appendix **S4** information but for which the date of inclusion of these modifications or additions in the BSS Plan is after the date of receipt of the above-mentioned Appendix **3** or Appendix **S4** information;

– the Radiocommunication Bureau shall identify the administrations whose assignments affect the above-mentioned Region 3 FSS networks in the 12.2-12.5 GHz frequency band;

3. the administrations which have been identified by the Radiocommunication Bureau in *resolves* 1. and 2. above shall make all possible mutual efforts to solve the interference problems.

NOTE 1 – The implications of this Resolution on the workload of the Bureau have to be taken into account.

NOTE 2 – Any retroactive application of this Resolution shall in no way have any implications regarding the status of assignments in both the BSS and the FSS as identified by the Bureau.

RESOLUTION 80 (WRC-97)

Due diligence in applying the principles embodied in the Constitution

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that Articles 12 and 44 of the Constitution (Geneva, 1992) lay down the basic principles for the use of the radio-frequency spectrum and the geostationary-satellite orbit;

b) that those principles have been incorporated in the Radio Regulations through No. **S0.3**;

c) that, in accordance with Nos. **S11.30**, **S11.31** and **S11.31.2**, notices shall be examined with respect to the provisions of the Radio Regulations, including the provision relating to the basic principles, appropriate rules of procedure being developed for the purpose,

resolves

1. to instruct the Radio Regulations Board, as a matter of urgency and within the framework of Nos. **S11.30**, **S11.31** and **S11.31.2** of the Radio Regulations, to develop the rules of procedure to be followed in examining due compliance with the principles reflected in No. **S0.3** in the process leading up to the recording of frequency assignments in the International Frequency Register. These rules shall be applied from a date to be decided by the 1999 World Radiocommunication Conference (WRC-99);

2. that the Board shall circulate the draft of these rules of procedure to administrations by 31 October 1998 with a view to receiving comments by 31 March 1999;

3. that the Board shall submit to WRC-99 a detailed report on the action taken on this Resolution.

RESOLUTION 95 (WRC-97)

General review of the Resolutions and Recommendations of world administrative radio conferences and world radiocommunication conferences

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that it is important to keep the Resolutions and Recommendations of the past world administrative radio conferences and world radiocommunication conferences under constant review, in order to keep them up to date;

b) that the Report of the Director of the Radiocommunication Bureau submitted to this Conference provided a useful basis for a general review of the Resolutions and Recommendations of past conferences which was conducted by this Conference,

invites future competent world radiocommunication conferences

to review the Resolutions and Recommendations of previous conferences with a view to their possible revision, replacement or abrogation and to take appropriate action,

instructs the Director of the Radiocommunication Bureau

to conduct a general review of the Resolutions and Recommendations of previous conferences and, if necessary after consultation with the Radiocommunication Advisory Group and the chairmen of the relevant radiocommunication study groups, to submit a report to future competent world radiocommunication conferences which indicates their current status, and what follow-up action may be advised.

RESOLUTION 121 (Rev.WRC-97)

Continued development of interference criteria and methodologies for fixed-satellite service coordination between feeder links of non-geostationary satellite networks in the mobile-satellite service and geostationary-satellite networks in the fixed-satellite service in the bands 19.3-19.7 GHz and 29.1-29.5 GHz

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the World Radiocommunication Conference (Geneva, 1995) made provision for use of the bands 19.3-19.6 GHz and 29.1-29.4 GHz by feeder links of non-geostationary-satellite networks in the mobile-satellite service (non-GSO MSS) and this Conference made provision for an additional 2×100 MHz in the bands 19.6-19.7 GHz and 29.4-29.5 GHz;

b) that coordination between feeder links of non-GSO MSS networks, and geostationary-satellite networks in the fixed-satellite service (GSO FSS) and terrestrial networks in these bands will be in accordance with Annex 2 of Resolution **46 (Rev.WRC-97)**/Annex 1 of Appendix **S5** to the Radio Regulations;

c) that simultaneous operation of GSO FSS networks and feeder links of non-GSO MSS networks will in most cases result in short-term, high-level interference between such networks, unless interference mitigation techniques are applied by both types of network;

d) that the CPM Report to this Conference concluded that, of the interference mitigation techniques that were studied, the use of adaptive power control, high-gain antennas and geographic isolation “appear to offer the most benefit in improving the sharing between non-GSO MSS feeder links and GSO FSS networks”;

e) that ITU-R has developed a Recommendation containing several alternative methodologies for deriving long-term and short-term interference criteria applicable for sharing between non-GSO MSS feeder links and GSO FSS networks;

f) that further development of the Recommendation in *considering e)* would facilitate the determination of appropriate interference mitigation techniques;

g) that No. **S5.541A** of the Radio Regulations requires the use of interference mitigation techniques in order to facilitate coordination of feeder links of non-GSO MSS networks with GSO FSS networks;

h) that the continued development and implementation of interference mitigation techniques would facilitate the coordination of feeder links of non-GSO MSS networks with GSO FSS networks when the interference between such networks exceeds the applicable permissible interference criteria,

resolves to invite ITU-R

1. to undertake, as a matter of urgency, the continued development of appropriate permissible interference criteria for both non-GSO MSS feeder links and GSO FSS networks operating in the bands 19.3-19.7 GHz and 29.1-29.5 GHz;

2. to undertake, as a matter of urgency, studies of interference mitigation techniques (including those techniques listed in *considering d)*) which could facilitate coordination between non-GSO MSS feeder links and GSO FSS networks;

3. to undertake, as a matter of urgency, studies to develop coordination methodologies for GSO FSS networks and non-GSO MSS feeder links operating in the bands 19.3-19.7 GHz and 29.1-29.5 GHz on an equal basis,

urges administrations

to participate actively in the aforementioned studies by submitting contributions to ITU-R,

instructs the Director of the Radiocommunication Bureau

to report on the progress of these studies to the 1999 World Radiocommunication Conference.

RESOLUTION 122 (WRC-97)

Use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz by high altitude platform stations in the fixed service and by other services

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the band 47.2-50.2 GHz is allocated to the fixed, mobile and fixed-satellite services on a co-primary basis;

b) that this Conference has made provision for operation of high altitude platform stations, also known as stratospheric repeaters, within the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz;

c) that ITU has among its purposes "to promote the extension of the benefit of the new telecommunication technologies to all the world's inhabitants" (No. 6 of the Constitution of the ITU (Geneva, 1992));

d) that systems based on new technologies using high altitude platforms will be able to provide high-capacity, competitive services to urban and rural areas;

e) that high altitude platform systems are in an advanced stage of development and some countries have notified such systems to ITU;

f) that the Radio Regulations Board issued a provisional rule of procedure concerning notification periods in No. **1228/S11.24** of the Radio Regulations in February 1997;

g) that in spite of the urgency attached to the development of such systems, technical, sharing and regulatory issues should be studied in order to achieve the most efficient use of the spectrum available for these systems;

h) that technical studies are required in order to ascertain the extent to which sharing of the bands 47.2-47.5 GHz and 47.9-48.2 GHz is feasible between systems using high altitude platforms in the fixed service and systems in the fixed, fixed-satellite and mobile services, and to ascertain the requirements to protect radio astronomy services in adjacent bands from spurious emissions;

i) that the radio astronomy service has primary allocations in the bands 42.5-43.5 GHz and 48.94-49.04 GHz;

j) that ITU-R studies are already under way on the preferred characteristics of systems using high altitude platforms and the feasibility of sharing between these systems and systems of other services and between these systems and other systems in the fixed service (Questions ITU-R 212/9, ITU-R 218/9 and ITU-R 251/4);

k) that No. **S5.552** of the Radio Regulations urges administrations to reserve fixed-satellite service use of the band 47.2-49.2 GHz for feeder links for the broadcasting-satellite service, and that preliminary ITU-R studies indicate that high altitude platform stations in the fixed service may share with broadcasting-satellite feeder links;

l) that the development of services using high altitude platform stations in these bands requires major investment and that manufacturers and operators should be given the confidence to make the necessary investment in these applications,

resolves

1. to urge administrations to facilitate coordination between high altitude platform stations in the fixed service operating in the bands 47.2-47.5 GHz and 47.9-48.2 GHz and other co-primary services in their territory and adjacent territories;

2. that, on a provisional basis, the procedures of Article **S9** of the Radio Regulations shall be used for coordination between satellite systems and high altitude platform systems;

3. to request ITU-R to carry out urgently studies on the appropriate technical sharing criteria for the situations referred to in *considering h)*, with priority given to the sharing with other systems in the fixed and fixed-satellite services, in particular the determination of the appropriate geographical separation from feeder links in the broadcasting-satellite service;

4. that the 1999 World Radiocommunication Conference (WRC-99) should review the results of these studies and consider refinement of the regulatory provisions that might facilitate a broader application of these high altitude platform technologies,

instructs the Director of the Radiocommunication Bureau

1. that notices concerning high altitude platform stations that were received by the Bureau prior to 22 November 1997, and provisionally recorded in the ITU Master International Frequency Register in accordance with the provisional rule of procedure issued by the Radio Regulations Board, shall be maintained;

2. that from 22 November 1997, and pending review of the sharing studies in *considering h)* and review of the notification process by WRC-99, the Bureau shall accept notices in the bands 47.2-47.5 GHz and 47.9-48.2 GHz only for high altitude platform stations in the fixed service and for feeder links for the broadcasting-satellite service, shall continue to process notices for fixed-satellite service networks (except for feeder links for the broadcasting-satellite service) for which complete information for advance publication has been received prior to 27 October 1997, and shall inform the notifying administrations accordingly.

RESOLUTION 123 (WRC-97)

Feasibility of implementing feeder links of non-geostationary satellite networks in the mobile-satellite service in the band 15.43-15.63 GHz (space-to-Earth) while taking into account the protection of the radio astronomy service, the Earth exploration-satellite (passive) service and the space research (passive) service in the band 15.35-15.4 GHz

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the band 15.43-15.63 GHz (space-to-Earth) is allocated to the fixed-satellite service on a primary basis for use by feeder links to non-geostationary (non-GSO) systems in the mobile-satellite service (MSS);

b) that this band is shared with aeronautical radionavigation services on a primary basis;

c) that No. **S4.10** of the Radio Regulations applies to the use of the band by aeronautical radionavigation services;

d) that, in accordance with No. **S5.511B** of the Radio Regulations, aircraft stations were not permitted to transmit in the band 15.45-15.65 GHz;

e) that this Conference recognized that airborne transmitters were operating in the aeronautical radionavigation service in the 15.43-15.63 GHz band;

f) that the feasibility of designing and operating feeder links in the space-to-Earth direction with the power flux-density limits in Table **S21-4** of Article **S21** of the Radio Regulations has not been studied by ITU-R;

g) that the band 15.35-15.4 GHz is allocated on a co-primary basis for exclusively passive use by the radio astronomy service, the earth exploration-satellite service and the space research service and protection from harmful interference from space stations is needed;

h) that No. **S5.511A** of the Radio Regulations provides that harmful interference shall not be caused to the radio astronomy service by MSS feeder links operated in the band 15.43-15.63 GHz;

i) that out-of-band emissions from MSS space stations in the band 15.43-15.63 GHz may cause interference to the radio astronomy service in the band 15.35-15.4 GHz;

j) that Recommendation ITU-R RA.769-1 specifies the levels of interference which are detrimental to the radio astronomy service, which may not be easily met by non-GSO MSS feeder links operating in the space-to-Earth direction,

invites ITU-R

1. to study, as a matter of urgency, in preparation for the 1999 World Radiocommunication Conference (WRC-99), the feasibility of implementing non-GSO MSS feeder links in the band 15.43-15.63 GHz, taking into account the above *considering*;

2. to study, as a matter of urgency, the interference potential of feeder links for non-GSO MSS satellites to the radio astronomy service in the 15 GHz band and develop Recommendations to reduce the out-of-band interference,

resolves

that WRC-99 should review the results of the above studies and take appropriate action, including possible adjustments in spectrum allocations.

RESOLUTION 124 (WRC-97)

Protection of the fixed service in the frequency band 8 025-8 400 MHz sharing with geostationary-satellite systems of the Earth exploration-satellite service (space-to-Earth)

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that prior to this Conference, the band 8 025-8 400 MHz was allocated to the earth exploration-satellite service (space-to-Earth) on a secondary basis in Regions 1 and 3, except for those countries listed in No. **S5.464** of the Radio Regulations;

b) that the power flux-density limits given in Table **S21-4** of Article **S21** of the Radio Regulations apply to emissions from space stations of the earth exploration-satellite service (space-to-Earth);

c) that, for those administrations where the secondary allocation applied before this Conference, geostationary orbital avoidance was not required for the fixed service and, therefore, the power flux-density limits given in Table **S21-4** of Article **S21** of the Radio Regulations may give rise to excessive interference to the fixed service;

d) that the administrations identified by No. **S5.462A** of the Radio Regulations have adopted provisional power flux-density limits lower than those shown in Table **S21-4** of Article **S21** to protect the fixed service;

e) that no studies have been conducted in this frequency band by ITU-R on the power flux-density values to apply to space stations of geostationary-satellite systems in the earth exploration-satellite service where geostationary orbital avoidance has not been implemented by stations of the fixed service,

considering further

that the band 8 025-8 400 MHz is used extensively by the fixed service in accordance with ITU-R channel arrangements for the 8 GHz band (see Recommendation ITU-R F.386) and is also used by some countries for television outside broadcast applications,

resolves

to invite ITU-R to study, as matter of urgency, the required power flux-density limits to be applied to space stations of geostationary-satellite systems in the earth exploration-satellite service (space-to-Earth) in the frequency band 8 025-8 400 MHz where geostationary orbital avoidance has not been implemented by the fixed service sharing the band,

urges administrations

to provide ITU-R with the necessary technical parameters of fixed-service links requiring protection in this frequency band.

RESOLUTION 125 (WRC-97)

Frequency sharing in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz between the mobile-satellite service and the radio astronomy service

The World Radiocommunication Conference (Geneva, 1997),

with a view

to enabling the mobile-satellite service (MSS) and the radio astronomy service to make the most efficient use of frequency bands allocated to them, having due regard to the other services to which those bands are also allocated,

considering

a) that the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz are allocated to the radio astronomy service and the MSS (Earth-to-space) on a co-primary basis;

b) that No. **S5.372** of the Radio Regulations states that "Harmful interference shall not be caused to stations of the radio astronomy service using the band 1 610.6-1 613.8 MHz by stations of the radiodetermination-satellite and mobile-satellite services (No. **2904/S29.13** applies)"; and that Article **36/S29** of the Radio Regulations also points out that emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service;

c) that the nature of objects studied by the radio astronomy service in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz demands maximum flexibility in the planning of observation frequencies;

d) that, in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz, which are shared between the radio astronomy service and the MSS, operational constraints are necessary for MSS mobile earth stations;

e) that a former ITU-R Recommendation relating to sharing between the MSS and the radio astronomy service in the band 1 660-1 660.5 MHz noted that further studies were required, particularly in the areas of propagation models and assumptions used for the determination of separation distances;

f) that Recommendation ITU-R M.1316 may be used in order to facilitate coordination between mobile earth stations and radio astronomy stations in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz;

g) that no experience has been gained up to now with the use of the Recommendation mentioned in *considering f)*;

h) that the threshold levels of interference detrimental to the radio astronomy service are given in Recommendation ITU-R RA.769-1,

resolves

that a future competent conference should evaluate frequency sharing in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz between the MSS and the radio astronomy service, based upon the experience gained with the use of ITU-R M.1316 and other relevant ITU-R Recommendations,

invites ITU-R

to submit a report to that future conference on evaluating the effectiveness of Recommendations aiming to facilitate sharing between the MSS and the radio astronomy service,

urges administrations

to participate actively in this evaluation.

RESOLUTION 126 (WRC-97)

Use of the frequency band 31.8-33.4 GHz for high-density systems in the fixed service

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that in the frequency band 31.8-33.4 GHz, high-density systems in the fixed service, if deployed, might cause interference to or receive interference from stations in the existing services and that the priority and degree of protection afforded to each service is a matter for each administration to consider;

b) that the band 31.8-33.4 GHz is allocated on a primary basis to the fixed and radionavigation services and that portions of the band are allocated on a primary basis to the space research (deep space) and inter-satellite services;

c) that sharing criteria for the fixed and other services in the frequency band 31.8-33.4 GHz have not yet been developed within ITU-R,

resolves

1. that the date of the provisional application of the allocation to the fixed service in the frequency band 31.8-33.4 GHz is 1 January 2001;

2. that the 1999 World Radiocommunication Conference (WRC-99) should review this allocation, including the date of 1 January 2001, taking full account of the future requirements and development of the other services to which the band is allocated and available ITU-R studies,

requests ITU-R

to conduct, as a matter of urgency and in time for WRC-99, the appropriate studies to determine what criteria would be necessary for sharing between stations in the fixed service and stations in the other services to which the frequency band 31.8-33.4 GHz is allocated.

RESOLUTION 127 (WRC-97)

Studies relating to consideration of allocations in bands around 1.4 GHz for feeder links of the non-geostationary-satellite systems in the mobile-satellite service with service links operating below 1 GHz

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the agenda of this Conference included consideration of the adoption of additional allocations for non-geostationary (non-GSO) satellite systems in the mobile-satellite service (MSS);

b) that the Report of the 1997 Conference Preparatory Meeting (CPM-97) stated that the Radiocommunication Bureau has identified at least 23 non-GSO MSS networks at frequencies below 1 GHz, at some stage of coordination under Resolution **46**, and that many of the proposed networks cannot be implemented in the existing allocations because there is not enough spectrum;

c) that CPM-97 stated that due to the extreme sensitivity of radio astronomy observations interference from unwanted (spurious and out-of-band) emissions can be a problem, but also noted that interference to radio astronomy can be avoided using various techniques including low-power transmitter levels, choice of modulation, bit shaping, output filtering and band limiting filters, the use of which can minimize the band separation necessary to meet the recommended interference threshold levels for out-of-band emissions;

d) that, since CPM-97, one administration has carried out additional analyses and hardware demonstrations with a view to determining the feasibility of sharing between non-GSO MSS feeder links and services such as the Earth exploration-satellite (passive), radio astronomy and space research (passive) services in bands around 1.4 GHz;

e) that factors taken into account by these post-CPM-97 activities in order to protect the passive services around 1.4 GHz from out-of-band emissions include: the use of narrow-band non-GSO MSS feeder-link transmissions; the use of spectrum-efficient modulation methods, such as Gaussian filtered minimum shift keying, having inherently rapid roll-off of out-of-band emissions; the use, where necessary, of band-pass filters in satellite transmitters and MSS feeder-link transmitting earth stations; and guardbands where necessary;

f) that factors taken into account by these post-CPM-97 activities concerning sharing with the radiolocation service include the use of conventional techniques that may be applied in MSS satellite receivers, such as intermediate frequency limiters and time diversity, which have long been employed to protect radiolocation receivers, and techniques such as transmitted waveforms employing time diversity, which have been employed to protect receivers in other services from high-power pulsed radar transmitters,

recognizing

that the bands near 1.4 GHz are extensively used by many other services operating in accordance with the Radio Regulations, including fixed and mobile services,

noting

a) that Resolution **214 (WRC-97)** states under *resolves* 1. that further studies are urgently required on operational and technical means to facilitate sharing between non-GSO MSS and other radiocommunication services having allocations and operating below 1 GHz;

b) that a former resolution identified issues relating to frequency sharing between the MSS and terrestrial services at frequencies below 3 GHz as being among the urgent studies required in preparation for this Conference;

c) that one administration performed such studies, which were submitted to ITU-R, but these studies could not be considered due to time limitations;

d) that, since the 1995 World Radiocommunication Conference, one administration has performed studies on sharing between space and terrestrial services and feeder links near 1.4 GHz for non-GSO MSS systems with service links below 1 GHz,

resolves

1. to invite ITU-R, as a matter of urgency, to carry out studies to determine the operational and technical measures required to facilitate sharing in portions of the band 1 390-1 400 MHz between existing and currently planned services and feeder links (Earth-to-space) for non-GSO MSS systems with service links operating below 1 GHz;

2. to invite ITU-R, as a matter of urgency, to carry out studies to determine operational and technical means to facilitate sharing, in portions of the band 1 427-1 432 MHz, between existing and currently planned services and feeder links (space-to-Earth) for non-GSO MSS systems with service links operating below 1 GHz;

3. to invite ITU-R, as a matter of urgency, to study operational and technical measures required to protect passive services in the band 1 400-1 427 MHz from unwanted emissions from feeder links near 1.4 GHz for non-GSO MSS systems with service links operating below 1 GHz;

4. to invite a future competent conference* to consider, on the basis of completion of studies referred to in *resolves* 1., 2. and 3., additional allocations for feeder links on a worldwide basis for non-GSO MSS systems with service links below 1 GHz,

urges administrations

to participate actively in such studies, with the involvement of interested parties.

---

* *Note by the Secretariat*: See Resolution **722 (WRC-97)**.

RESOLUTION 128 (WRC-97)

Allocation to the fixed-satellite service (space-to-Earth) in the 41.5-42.5 GHz band and protection of the radio astronomy service in the 42.5-43.5 GHz band

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that this Conference has added a primary allocation to the fixed-satellite service (space-to-Earth) in the band 41.5-42.5 GHz in Regions 2 and 3 and in certain countries in Region 1 and that this band is adjacent to the band 42.5-43.5 GHz which is allocated, *inter alia*, to the radio astronomy service for both continuum and spectral line observations;

b) that unwanted emissions from space stations in the fixed-satellite service (space-to-Earth) in the band 41.5-42.5 GHz may result in harmful interference to the radio astronomy service in the band 42.5-43.5 GHz;

c) that various technical means may be used to reduce these unwanted emissions from space stations in the fixed-satellite service;

d) that a limited number of radio astronomy stations worldwide require protection, and that there may be means to limit the susceptibility of radio astronomy receivers to interference,

taking into account

the relevant provisions of the Radio Regulations,

resolves

that administrations shall not implement fixed-satellite systems in the band 41.5-42.5 GHz until technical and operational measures have been identified and agreed within ITU-R to protect the radio astronomy service from harmful interference in the band 42.5-43.5 GHz,

invites ITU-R

1. to study, as a matter of urgency, the harmful interference that space stations in the fixed-satellite service (space-to-Earth) operating in the band 41.5-42.5 GHz may cause to stations in the radio astronomy service operating in the band 42.5-43.5 GHz;

2. to identify technical and operational measures that may be taken to protect stations in the radio astronomy service operating in the band 42.5-43.5 GHz, including geographical separation and out-of-band emission limits to be applied to space stations operating in the fixed-satellite service in the band 41.5-42.5 GHz, as well as measures that may be implemented to reduce the susceptibility of stations in the radio astronomy service to harmful interference;

3. to report on the results of these studies to the Conference Preparatory Meeting for the 1999 World Radiocommunication Conference (WRC-99),

urges administrations

to participate actively in the aforementioned studies by submitting contributions to ITU-R,

requests

WRC-99 to take appropriate action based on those studies.

RESOLUTION 129 (WRC-97)

Criteria and methodologies for sharing between the fixed-satellite service and other services with allocations in the band 40.5-42.5 GHz

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that this Conference has added a primary allocation to the fixed-satellite service (space-to-Earth) in Regions 2 and 3 and in certain countries in Region 1 and to the fixed service in the band 40.5-42.5 GHz;

b) that these allocations will provide flexibility to those administrations that seek to implement systems in the bands between 36 GHz and 50 GHz;

c) that space service networks (fixed-satellite service and broadcasting-satellite service) will share the band 40.5-42.5 GHz on a primary basis with the fixed and broadcasting services;

d) that § 7.5 of the Report of the Conference Preparatory Meeting to this Conference recognized that sharing of spectrum in frequency bands above 30 GHz between the fixed service and one or more other services could result in service impairments, and that there may be utility in further study of the feasibility of co-frequency sharing between the fixed service and other services with allocations in these bands;

e) that it may be useful to consider the identification of this spectrum range for high-density fixed service applications;

f) that given *considering a)* to *e)*, it would be useful to conduct such studies in the band 40.5-42.5 GHz;

g) that the new co-primary allocations to the fixed-satellite service and fixed service referred to in *considering a)* above are in the band adjacent to the band 42.5-43.5 GHz, which is the subject of an ITU-R study programme under Resolution **128 (WRC-97)**;

h) that there is a need to establish sharing criteria, including power flux-density limits, to facilitate the co-existence of the space and terrestrial services with allocations in the band 40.5-42.5 GHz,

resolves to invite ITU-R

1. to undertake, as a matter of urgency, studies of appropriate criteria and methodologies for sharing, including power flux-density limits, between the fixed-satellite service and the other services with allocations in the band 40.5-42.5 GHz;

2. to report on the results of these studies to the Conference Preparatory Meeting for the 1999 World Radiocommunication Conference (WRC-99),

urges administrations

to participate actively in the aforementioned studies by submitting contributions to ITU-R,

requests

WRC-99 to take appropriate action based on the results of those studies.

RESOLUTION 130 (WRC-97)

Use of non-geostationary systems in the fixed-satellite service in certain frequency bands

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the International Telecommunication Union has, among its purposes, "to promote the extension of the benefit of the new telecommunication technologies to all the world's inhabitants" (No. 6 of the Constitution of the International Telecommunication Union (Geneva, 1992));

b) that it is desirable, in this respect, to promote systems capable of providing universal service;

c) that new telecommunication services need advanced and reliable networks permitting high-capacity communications;

d) the need to encourage the development and implementation of new technologies;

e) that systems based on the use of new technologies associated with both geostationary (GSO) and non-geostationary (non-GSO) satellite constellations are capable of providing the most isolated regions of the world with high-capacity and low-cost means of communication;

f) that there should be equitable access to the radio-frequency spectrum and orbital resources in a mutually acceptable manner that allows for new entrants in the provision of services;

g) that all Members of the Union would benefit from the implementation of proposed systems in the allocated spectrum and from avoidance of monopolization or exclusive use of an allocation by a single system;

h) that the operation of such systems requires a suitable amount of spectrum in appropriate frequency bands;

i) that decisions on this matter should permit the operation of as many systems as possible;

j) that, in spite of the urgency attached to the development of such systems, technical, operational and regulatory issues should be studied in order to achieve the most efficient use of the spectrum that may be available for these systems;

k) that there is a need for the provision of services on a competitive basis between GSO fixed-satellite service (FSS) and non-GSO FSS as well as between non-GSO FSS and non-GSO FSS;

l) that the Radio Regulations must be sufficiently flexible to accommodate the introduction and implementation of innovative technologies as they evolve, and allow the further development and implementation of any proposed system in conformity with their provisions,

considering further

a) that further technical, operational and regulatory studies are required in order to determine further the conditions under which sharing of the frequency bands 10-30 GHz which are allocated to the FSS and where Resolution **46 (Rev.WRC-97)** does not apply is feasible between GSO and non-GSO systems, between non-GSO systems and between non-GSO and terrestrial systems;

b) that it is likely that non-GSO FSS systems communicated to the Radiocommunication Bureau will not be brought into use before the 1999 World Radiocommunication Conference (WRC-99);

c) that the diverging interpretations arising from No. **S22.2** of the Radio Regulations result in an ambiguous regulatory status for both existing and future GSO and non-GSO systems in the FSS in the bands where this provision applies, with consequential risks for both types of systems;

d) that the harmonious development of non-GSO and GSO systems in the FSS requires that these ambiguities be resolved with no further delay;

e) that in resolving these ambiguities in the bands referred to in *resolves* 1. below, the GSO arc must be protected to ensure continued use of

existing FSS systems and the development of new GSO technologies and systems in both non-planned bands and bands where plans exist;

f) that these ambiguities may be resolved in certain frequency bands by adopting power flux-density (pfd) limits which would apply to non-GSO FSS systems to protect GSO FSS systems, and by including in Article **S22** of the Radio Regulations limits on the power radiated by non-GSO FSS systems in order adequately to protect GSO FSS systems in the frequency bands and sharing situations where Resolution **46 (Rev.WRC-97)** does not apply;

g) that in certain frequency bands which are currently used or planned to be used extensively by GSO FSS systems, provisional power flux-density limits applicable to non-GSO FSS systems have been developed;

h) that non-GSO FSS systems have been proposed in some of these bands which could meet these limits and would not require specific protection from existing and future GSO FSS systems, provided that minimum constraints are applied to GSO FSS systems, such as off-axis earth station e.i.r.p. limits;

i) that in the bands where the limits referred to in *considering further f)*, *g)* and *h)* would apply, there would be no need for a coordination procedure between non-GSO FSS and GSO systems, with the exception of coordination between earth stations operating in opposite directions of transmission;

j) that there would be a need for a coordination procedure between non-GSO systems in the FSS and between non-GSO FSS systems and non-GSO systems in other services and for specific sharing criteria associated with this procedure, taking into consideration various types of non-GSO systems, including those in highly elliptical orbits;

k) the need to protect other co-primary services having allocations in the frequency bands referred to in *considering further a)* above and the need to assess further the sharing conditions between non-GSO FSS systems and these services;

l) that further studies on sharing conditions in frequency bands other than the 10-30 GHz frequency bands, where Resolution **46 (Rev.WRC-97)** does not apply, may also be necessary on the basis of the requirements that may emerge,

noting

1. that information relating to GSO and non-GSO systems in the FSS in the 10-30 GHz bands has been communicated to the Radiocommunication Bureau;

2. that some of these systems are in operation and others will be operated in the near future and, consequently, difficulties may be experienced in modifying their characteristics;

3. the need to protect existing and future terrestrial and space services and systems;

4. that No. **S22.2** is an operational provision which is to be applied between administrations, and does not require any specific action or finding by the Bureau,

recognizing

that the geostationary-satellite orbit and its associated spectrum are a uniquely valuable resource and that equitable access to this resource needs to be protected for all countries in the world,

resolves

1. that, as of 22 November 1997, in the frequency bands specified in Tables **S22-3** and **S22-4** of Article **S22**, and in Tables 1 and 2 in Annex 1 to this Resolution, non-GSO FSS systems shall apply the procedures of Sections I and III of Article **11**/Section I of Article **S9**, Nos. **S9.17** and **S9.17A** and the procedures of Article **13/S11** of the Radio Regulations, and the non-GSO FSS systems for which complete notification information has been received by the Radiocommunication Bureau after 21 November 1997 shall be subject to the provisional power limits in Article **S22** and in Annex 1 to this Resolution;

2. that these limits shall be applied provisionally until the end of WRC-99, and that non-GSO FSS systems for which complete notification information has been received by the Radiocommunication Bureau after 21 November 1997 shall be subject to the power limits in Article **S22**, as revised, if appropriate, by WRC-99;

3. that, as of 22 November 1997, in applying No. **S22.2,** administrations may consider these provisional power limits as corresponding to permissible levels of interference from a non-GSO system into a GSO system, irrespective of the dates of receipt by the Bureau of the complete notification information relating for the non-GSO system and of the complete coordination information for the GSO network;

4. that, as of the end of WRC-99, an administration operating a non-GSO FSS system which is in compliance with the limits in Article **S22**, as revised, if appropriate, by WRC-99, shall be considered as having fulfilled its obligations under No. **S22.2** with respect to any GSO network, irrespective of the dates of receipt by the Bureau of the complete notification information for the non-GSO system and of the complete coordination information for the GSO network;

5. that, as of the end of WRC-99, in the frequency bands specified in No. **S22.29** of the Radio Regulations and § 2.4 of Annex 1 to this Resolution, GSO FSS systems for which complete coordination information has been received by the Bureau after the end of WRC-99 shall be subject to the limits in Article **S22** and in § 2.1, 2.2 and 2.3 of Annex 1 to this Resolution, as revised, if appropriate, by WRC-99;

6. that, as of 22 November 1997, in the frequency bands specified in No. **S22.29** and Tables 1 and 2 of Annex 1 to this Resolution, non-GSO systems shall not claim protection from GSO networks in the FSS operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete notification information for the non-GSO FSS systems and of the complete coordination information for the GSO networks;

6.1 that, between 22 November 1997 and the end of WRC-99, if an administration operating or bringing into use a GSO FSS system before the end of WRC-99 considers that a non-GSO FSS system proposed by another administration might cause unacceptable interference into its GSO system, then:

6.1.1 the administration operating the GSO system shall send to the administration operating the non-GSO FSS system the technical details upon which its disagreement is based,

6.1.2 in the bands from 10.7 GHz to 14.5 GHz, the administration operating the non-GSO FSS system shall resolve the difficulties,

6.1.3 in the bands 17.8-18.6 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 27.5-28.6 GHz (Earth-to-space) and 29.5-30.0 GHz (Earth-to-space), the administrations concerned shall make every possible effort to resolve the difficulties by means of mutually acceptable adjustments to their networks;

7. that, if an administration bringing into use a GSO FSS system after the end of WRC-99 considers that a non-GSO FSS system proposed by another administration and which complies with the limits in Article **S22**, as revised, if appropriate, by WRC-99, might cause unacceptable interference into its GSO system, the administrations concerned shall make every possible effort to resolve the difficulties by means of mutually acceptable adjustments to their networks;

8. that, as of 22 November 1997, non-GSO systems in the FSS in the frequency bands referred to in *resolves* 1. above, shall, for coordination with other non-GSO FSS systems, be subject to application of the provisions of § 2.1 of Section II of Resolution **46 (Rev.WRC-97)**/No. **S9.12** of the Radio Regulations,

requests ITU-R

1.[1] taking into account *considering further a)*, to conduct, as a matter of urgency, and complete, in time for consideration by WRC-99:

1.1 the appropriate technical, operational and regulatory studies to review the regulatory conditions relating to the coexistence of non-GSO and GSO systems in the FSS, in order to ensure that they do not impose undue constraints on the development of non-GSO and GSO FSS systems;

1.2 the development of a methodology for calculating the power levels produced by non-GSO FSS systems and the compliance of these levels with the limits referred to in *resolves* 1. and 2. above;

1.3 the studies relating to the sharing criteria to be applied for determining the need for coordination between non-GSO FSS systems and the need for coordination between terrestrial services and non-GSO systems in the FSS and in other space services, with a view to promoting efficient use of spectrum/orbit resources and equitable access to these resources by all countries;

2.[1] taking into account *considering further l)*, to undertake the development of power limits or other frequency sharing mechanisms among GSO, non-GSO and terrestrial systems in the frequency bands other than those referred to in *resolves* 1. above and where non-GSO FSS systems are likely to be implemented and GSO systems are used or expected to be used extensively,

instructs the Radiocommunication Bureau

as of the end of WRC-99, to review and, if appropriate, revise, any finding previously made on the compliance with the limits contained in Article **S22** of a non-GSO FSS system for which notification information has been received between 22 November 1997 and the end of WRC-99. This review shall be based on the values in Article **S22**, as revised, if appropriate, by WRC-99.

---

[1] See Annex 2 for further details concerning specific aspects of these studies in relation to frequency sharing between the non-GSO FSS and the GSO FSS.

ANNEX 1 TO RESOLUTION 130 (WRC-97)

Provisional limits

Section I. Control of Interference to Geostationary-Satellite Systems

1.1 The equivalent power flux-density[1], at any point on the Earth's surface visible from the geostationary-satellite orbit, produced by emissions

---

[1] The equivalent power flux-density is defined as the sum of the power flux-densities produced at a point on the Earth's surface by all space stations within a non-geostationary-satellite system, taking into account the off-axis discrimination of a reference receiving antenna assumed to be pointing towards the geostationary-satellite orbit. The equivalent power flux-density is calculated using the following formula:

$$epfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N_s} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{max}}\right]$$

where:

N_s: number of non-geostationary space stations visible from the point considered at the Earth's surface, within an elevation angle greater than or equal to 0°;

i: index of the non-geostationary space station considered;

pfd_i: power flux-density produced at the point considered on the Earth's surface in dB(W/m^2) in the reference bandwidth;

θ_i: angle between the direction considered towards the geostationary-satellite orbit and the direction of the interfering space station in the non-geostationary-satellite system;

$G_r(\theta_i)$: gain (as a ratio) of the receive reference antenna to be considered as part of a geostationary-satellite network;

G_{max}: maximum gain (as a ratio) of the above receive reference antenna;

$epfd$: computed equivalent power flux-density in dB(W/m^2) in the reference bandwidth.

from all the space stations of a non-geostationary-satellite system in the fixed-satellite service in the frequency bands listed in Table 1, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall not exceed the limits given in Table 1 for the given percentages of time. These limits relate to the equivalent power flux-density which would be obtained under free-space propagation conditions into all the reference antennas and in the reference bandwidths specified in Table 1, and for all pointing directions towards the geostationary-satellite orbit.

NOTE - Table 1 contains provisional limits corresponding to an interference level caused by one non-GSO FSS system in the frequency bands to be applied in accordance with this Resolution. These provisional limits are subject to review by ITU-R and are subject to confirmation by WRC-99.

TABLE 1

PART A

Frequency band (GHz)	Equivalent pfd dB(W/m^2)	Percentage of time during which equivalent pfd level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern
10.7-11.7,	–179	99.7	4	60 cm, Rec. ITU-R S.465-5
11.7-12.2 in Region 2,	–192	99.9	4	3 m, Rec. ITU -R S.465-5
	–186	99.97	4	3 m, Rec. ITU-R S.465-5
12.2-12.5 in Region 3	–195	99.97	4	10 m, Rec. ITU -R S.465-5
12.5-12.75 in Regions 1 and 3	–170	99.999	4	60 cm, Rec. ITU-R S.465-5
	–173	99.999	4	3 m, Rec. ITU-R S.465-5
	–178	99.999	4	10 m, Rec. ITU-R S.465-5
	–170	100	4	≥ 60 cm, Rec. ITU-R S.465-5

TABLE 1

PART B

Frequency band (GHz)	Equivalent pfd dB(W/m^2)	Percentage of time during which equivalent pfd level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern
17.8-18.6	–165 –151	99.0	40 1000	30 cm, Rec. ITU-R S.465-5
	–165 –151	99.0	40 1000	70 cm, Rec. ITU-R S.465-5
	–165 –151	99.5	40 1000	90 cm, Rec. ITU-R S.465-5
	–167 –153	99.8	40 1000	1.5 m, Rec. ITU-R S.465-5
	–180 –166	99.9	40 1000	5 m, Rec. ITU-R S.465-5
	–184 –170	99.9	40 1000	7.5 m, Rec. ITU-R S.465-5
	–188 –174	99.9	40 1000	12 m, Rec. ITU-R S.465-5
	–165 –151	100	40 1000	30 cm to 12 m, Rec. ITU-R S.465-5
19.7-20.2	–154 –140	99.0	40 1000	30 cm, Rec. ITU-R S.465-5
	–164 –150	99.9	40 1000	90 cm, Rec. ITU-R S.465-5
	–167 –153	99.8	40 1000	2 m, Rec. ITU-R S.465-5
	–174 –160	99.9	40 1000	5 m, Rec. ITU-R S.465-5
	–154 –140	100	40 1000	30 cm to 12 m, Rec. ITU-R S.465-5

1.2 The aggregate power flux-density[2] produced at any point in the geostationary-satellite orbit by the emissions from all the earth stations in a non-geostationary-satellite system in the fixed-satellite service, for all

---

[2] The aggregate power flux-density is defined as the sum of the power flux-densities produced at a point in the geostationary-satellite orbit by all the earth stations of a non-geostationary-satellite system. The aggregate power flux-density is computed by means of the following formula:

$$apfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N_e} 10^{P_i/10} \cdot \frac{G_t(\theta_i)}{4\,\pi\, {d_i}^2}\right]$$

where:

N_e: number of earth stations in the non-geostationary-satellite system with an elevation angle greater than or equal to 0°, from which the point considered in the geostationary-satellite orbit is visible;

i: index of the earth station considered in the non-geostationary-satellite system;

P_i: RF power at the input of the transmitting antenna of the earth station considered in the non-geostationary-satellite system in dBW in the reference bandwidth;

θ_i: off-axis angle between the boresight of the earth station considered in the non-geostationary-satellite system and the direction of the point considered in the geostationary-satellite orbit;

$G_t(\theta_i)$: transmit antenna gain (as a ratio) of the earth station considered in the non-geostationary-satellite system in the direction of the point considered in the geostationary-satellite orbit;

d_i: distance in metres between the earth station considered in the non-geostationary-satellite system and the point considered in the geostationary-satellite orbit;

apfd: aggregate power flux-density in dB(W/m^2) in the reference bandwidth.

conditions and for all methods of modulation, shall not exceed the limits given in Table 2 for any percentage of time. These limits relate to the power flux-density which would be obtained under free-space propagation conditions in the reference bandwidth specified in Table 2.

NOTE – Table 2 contains provisional limits corresponding to an interference level caused by one non-geostationary fixed-satellite service system in the frequency bands to be applied in accordance with this Resolution. These provisional limits are subject to review by ITU-R and are subject to confirmation by the 1999 World Radiocommunication Conference.

TABLE 2

PART A

Frequency band (GHz)	Aggregate pfd dB(W/m^2)	Percentage of time during which aggregate pfd level may not be exceeded	Reference bandwidth (kHz)
12.5-12.75	–170	100	4
12.75-13.25 and	–186	100	4
13.75-14.5	–170	100	4

TABLE 2

PART B

Frequency band (GHz)	Aggregate pfd dB(W/m^2)	Percentage of time during which aggregate pfd level may not be exceeded	Reference bandwidth (kHz)
27.5-28.6 and	–159	100	40
29.5-30	–145	100	1 000

1.3 The limits given in Table 1 may be exceeded on the territory of any country whose administration has so agreed.

Section II. Earth Station Off-Axis Power Limitations in the Fixed-Satellite Service[1]

2.1 The level of equivalent isotropically radiated power (e.i.r.p.) emitted by an earth station shall not exceed the following values for any off-axis angle φ which is 2.5° or more off the main-lobe axis of an earth station antenna:

Off-axis angle	*Maximum e.i.r.p.*
$2.5° \le \varphi \le 7°$	(39 – 25 log φ) dB(W/40 kHz)
$7° < \varphi \le 9.2°$	18 dB(W/40 kHz)
$9.2° < \varphi \le 48°$	(42 – 25 log φ) dB(W/40 kHz)
$48° < \varphi \le 180°$	0 dB(W/40 kHz)

2.2 For FM-TV emissions with energy dispersal, the limits in § 2.1 above may be exceeded by up to 3 dB provided that the off-axis total e.i.r.p. of the transmitted FM-TV carrier does not exceed the following values:

Off-axis angle	*Maximum e.i.r.p.*
$2.5° \le \varphi \le 7°$	(53 – 25 log φ) dBW
$7° < \varphi \le 9.2°$	32 dBW
$9.2° < \varphi \le 48°$	(56 – 25 log φ) dBW
$48° < \varphi \le 180°$	14 dBW

[1] The provisions of this section are suspended pending the review of the values in § 2.1, 2.2 and 2.3 by the 1999 World Radiocommunication Conference.

2.3 FM-TV carriers which operate without energy dispersal should be modulated at all times with programme material or appropriate test patterns. In this case, the off-axis total e.i.r.p. of the emitted FM-TV carrier shall not exceed the following values:

Off-axis angle	*Maximum e.i.r.p.*
$2.5° \le \varphi \le 7°$	$(53 - 25 \log \varphi)$ dBW
$7° < \varphi \le 9.2°$	32 dBW
$9.2° < \varphi \le 48°$	$(56 - 25 \log \varphi)$ dBW
$48° < \varphi \le 180°$	14 dBW

2.4 The e.i.r.p. limits given in § 2.1, 2.2 and 2.3 are applicable in the following frequency bands allocated to the fixed-satellite service (Earth-to-space):

12.75-13.25 GHz

13.75-14 GHz

14-14.5 GHz

ANNEX 2 TO RESOLUTION 130 (WRC-97)

ITU-R studies on frequency sharing between non-GSO FSS and GSO FSS

The following is a list of the studies and related activities required.

1. Characterization of short-duration interference peaks which might exceed equivalent pfd limits set by a world radiocommunication conference for large earth station antennas, in terms of maximum and mean amplitudes, maximum and mean durations, mean time between occurrences, aggregate percentages of time of occurrences and typical amplitude/time profiles.

2. Acquisition of data relating to the impact of the interference peaks on the performance of a range of earth station demodulators of various types and origins. Administrations are encouraged to cooperate in this matter by arranging for the appropriate measurements to be carried out, and submitting the results to the appropriate working parties or task groups in time to be included in the ITU-R report to the next conference.

3. Carrying out computer simulations to determine the impact on equivalent pfd statistics of multiple non-GSO networks interfering with a GSO downlink, and in particular to discover the percentage-of-time thresholds for which the probability of simultaneous interference peaks from satellites in different non-GSO constellations becomes significant. Both homogeneous and inhomogeneous sets of non-GSO systems should be simulated where the necessary data are available.

4. Conducting investigations to find out whether the emissions from the satellites and earth stations of non-GSO systems would cause problems for the tracking, telemetry and command (TTC) of GSO (and non-GSO) satellites, during both their launch and operational phases, and the development of methods for avoiding such problems.

5. Carrying out computer simulations to derive the time statistics of short-term interference between two or more non-GSO FSS networks, with the objective of determining the approximate number of such networks which could co-exist in the same bands.

6. Identification and validation of software which could be used by the Radiocommunication Bureau to check whether a system for which an application for spectrum has been made would comply with the equivalent pfd and aggregate pfd limits.

7. Carrying out studies to determine the feasibility of frequency sharing between non-GSO FSS networks using circular orbits and networks using slightly-inclined geostationary orbits, and also between non-GSO FSS networks and networks using "quasi-geostationary" orbits.

8. Development, if practicable, of continuous curves of equivalent pfd versus antenna diameter and/or *G/T* of the GSO earth station to be protected. Whilst it may be necessary to limit the compliance checking by the Radiocommunication Bureau to a few discrete antenna sizes, administrations will need to know that the protection will be adequate in the case of antennas of other sizes; hence the desirability of continuous curves.

9. Continuation of studies on techniques for the mitigation of interference between GSO and non-GSO networks, and between non-GSO networks.

10. Refinement of the methodologies in Recommendation ITU-R S.1323 for the derivation of *I/N* limits and their conversion to equivalent pfd and aggregate pfd limits, taking into account propagation fade statistics, the different circumstances of "transparent" and remodulating satellite transponders, and the impact of fade counter-measures such as adaptive power control.

11. Consideration of how account can be taken, in studies concerning the definition of uplink limits, of the gain versus off-axis angle characteristics of the receiving spot beams of geostationary satellites.

12. Taking into account that the bands allocated to the FSS are used by the fixed, radiolocation and space science services, study of the criteria for sharing between non-GSO FSS and GSO FSS systems and systems in those services.

RESOLUTION 131 (WRC-97)

Power flux-density limits applicable to non-geostationary fixed-satellite service systems for protection of terrestrial services in the bands 10.7-12.75 GHz and 17.7-19.3 GHz

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the power flux-density (pfd) limits specified in Table **S21-4** of Article **S21** for the bands 10.7-12.75 GHz and 17.7-19.7 GHz for the protection of terrestrial services were originally developed assuming that potentially interfering space stations in the fixed-satellite service (FSS) would operate in the geostationary-satellite orbit (GSO);

b) that the results of studies to date on potential interference from non-GSO FSS networks in the 18.8-19.3 GHz range, but which may be extrapolated to the 17.7-19.3 GHz range, differ as to whether the pfd limits in Article **S21** of the Radio Regulations would provide adequate protection of the fixed service when applied to non-GSO networks with a large number of satellites (i.e. greater than 100);

c) that, in the 10.7-12.75 GHz band, some initial sharing studies have been undertaken and further work is required in order to assess the adequacy of the existing pfd limits;

d) that further studies are required of the pfd limits applicable to non-GSO FSS systems for the protection of terrestrial services in the bands 10.7-12.75 GHz and 17.7-19.3 GHz,

noting

a) that the former Resolution **118 (WRC-95)** requested studies of the criteria for sharing between non-GSO FSS systems and terrestrial services in the 20/30 GHz bands;

b) that non-GSO FSS networks are being developed that take into account the power flux-density limits that were in force prior to this Conference; however, in the band 18.8-19.3 GHz, these values were subject to review by ITU-R;

c) that modifications to existing FSS network design or operating parameters may be needed in order to obtain conformance with the revised limits adopted by this Conference;

d) that the band 18.6-18.8 GHz is allocated to the earth exploration-satellite (passive) and space research (passive) services and that administrations should endeavour to reduce to a minimum the risks of interference to passive sensors; the interference criteria for satellite passive sensors are contained in Recommendation ITU-R SA.1029,

resolves

1. that emissions from a space station in non-GSO FSS networks in the bands 10.7-12.75 GHz and 17.7-19.3 GHz shall comply with the pfd limits contained in Article **S21** and in Annex 1 to this Resolution for the protection of terrestrial services (see *considering d)*);

2. that in view of *noting b)* in relation to the 18.8-19.3 GHz band in the case of non-GSO FSS networks for which complete coordination or notification information has been received by the Radiocommunication Bureau by 17 November 1995, or are in operation by that date, the pfd limits which were in force prior to 27 October 1997 shall continue to apply; in the case of non-GSO FSS networks for which such information was received after 17 November 1995, the power flux-density limits in Annex 1 to this Resolution will apply,

invites ITU-R

to study, as a matter of urgency, the appropriate pfd values to be applied to non-GSO networks in the aforementioned bands to ensure protection of the fixed service without unduly constraining the development of either type of network,

requests the 1999 World Radiocommunication Conference

to review the provisional limits referred to in *resolves* 1 based on the results of the studies carried out by ITU-R,

urges administrations

to consider reductions in the pfd or the number of satellites in non-GSO FSS networks within the spirit of No. **S9.58** of the Radio Regulations, so as to facilitate sharing between non-GSO FSS networks and systems in the fixed service.

ANNEX 1 TO RESOLUTION 131 (WRC-97)

Frequency band	Service	Limits in dB(W/m^2) for angle of arrival δ above the horizontal plane			Reference bandwidth
		0°-5°	5°-25°	25°-90°	
10.7-11.7 GHz	Fixed-satellite (space-to-Earth)	–150[1)]	–150 + 0.5 (δ – 5)[1)]	–140[1)]	4 kHz
12.2-12.5 GHz (Region 3) 12.5-12.75 GHz (Region 1 and Region 3 countries listed in Nos. **S5.494** and **S5.496**)	Fixed-satellite (space-to-Earth)	–148[1)]	–148 +0.5 (δ – 5)[1)]	–138[1)]	4 kHz
11.7-12.5 GHz (Region 1) 12.2-12.7 GHz (Region 2) 11.7-12.2 GHz (Region 3) 11.7-12.2 GHz (Region 2)	Fixed-satellite (space-to-Earth), non-GSO	–148[2)]	–148 + 0.5 (δ – 5)[2)]	–138[2)]	4 kHz
17.7-19.3 GHz[3). 4)]	Fixed-satellite (space-to-Earth)	–115 or –125[5)]	–115 + 0.5 (δ – 5) or –125 + (δ – 5)[5)]	–105 or –105[5]	1 MHz

1) Although these limits apply to both GSO and non-GSO FSS satellites, values for non-GSO systems require further study.

2) These values require further study.

3) The equality of rights to operate when a frequency band is allocated in different Regions to different services of the same category is established in No. **S4.8** of the Radio Regulations. Therefore, any limits concerning inter-Regional interference which may appear in ITU-R Recommendations should, as far as practicable, be observed by administrations.

4) The band 18.6-18.8 GHz is allocated to the earth exploration-satellite (passive) and space research (passive) services. Administrations should endeavour to reduce to a minimum the risks of interference to passive sensors. The interference criteria for satellite passive sensors are contained in Recommendation ITU-R SA.1029.

5) These values shall apply provisionally only to emissions of space stations on non-geostationary satellites in networks operating with a large number of satellites, that is systems operating with more than 100 satellites.

RESOLUTION 132 (WRC-97)

Use of the bands 18.8-19.3 GHz and 28.6-29.1 GHz by networks operating in the fixed-satellite service

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that, by the former Resolution **118 (WRC-95)**, the 1995 World Radiocommunication Conference (WRC-95) recommended that this Conference review the results of studies carried out by ITU-R relating to the use of the frequency bands 20/30 GHz;

b) that it also recommended that this Conference take appropriate action, including adjustments to spectrum allocations, for the harmonious development of geostationary-satellite orbit (GSO) and non-geostationary-satellite orbit (non-GSO) systems and terrestrial services in the same bands;

c) that it has reviewed the above studies, and has taken appropriate action in relation to the use of the frequency bands 18.8-18.9 GHz and 28.6-28.7 GHz as indicated in No. **S5.523A** of the Radio Regulations;

d) that, in its Resolution **118 (WRC-95)**, WRC-95 considered:

– that the development of GSO and non-GSO systems in the bands 18.8-19.3 GHz and 28.6-29.1 GHz entails major global investment and, consequently, their reciprocal coordination needs the firm commitment of all parties concerned on the basis of application of Resolution **46 (Rev.WRC-97)**;

– that this Conference considered the non-application of No. **2613/S22.2** of the Radio Regulations in the bands 18.8-19.3 GHz and 28.6-29.1 GHz in light of the spectrum requirements for non-GSO fixed-satellite service (FSS) systems;

e) that WRC-95 adopted in *resolves* 1. to 5. of Resolution **118 (WRC-95)** the procedures applicable to the frequency bands 18.9-19.3 GHz and 28.7-29.1 GHz only;

f) that, in the light of *considering d)* and *e)* above, GSO and non-GSO FSS systems referred to in **S5.523A** are being developed in the bands 18.8-19.3 GHz and 28.6-29.1 GHz;

g) that **S5.523A** will enter into force on the date indicated in Article **S59** of the Radio Regulations;

h) that this Conference decided to delete Resolution **118 (WRC-95)**, as of 22 November 1997,

noting

that the band 18.8-19.3 GHz is heavily used by the fixed service and there is a need to continue the use of this band in many countries,

resolves

1. that, as of 18 November 1995, the provisions of Resolution **46 (Rev.WRC-95)** (Resolution **46 (Rev.WRC-97)**/No. **S9.11A** of the Radio Regulations as of 22 November 1997) shall apply and No. **S22.2** of the Radio Regulations shall not apply in the bands 18.8-19.3 GHz and 28.6-29.1 GHz, to frequency assignments of GSO and non-GSO FSS systems;

2. that should modifications arise to frequency assignments of non-GSO FSS systems which were notified before 18 November 1995, when coordination was not required, then no coordination is required when the characteristics of the modified frequency assignment are within the limits of those of the original notification,

instructs the Radiocommunication Bureau

to apply the provisions of No. **S5.523A**, in the bands 18.8-19.3 GHz and 28.6-29.1 GHz, as from 22 November 1997.

RESOLUTION 133 (WRC-97)

Sharing between the fixed service and other services in the band 37-40 GHz

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the band 37-40 GHz is allocated to the fixed service on a primary basis and that an increasing number of stations in the fixed service are deployed or being planned for use;

b) that the band 37.5-40 GHz is allocated on a primary basis to the fixed-satellite service (FSS) and that an increasing number of FSS systems are being planned for use;

c) that the deployment of high-density systems in either the fixed service or FSS may result in interference to the FSS from stations in the fixed service, and that the priority and degree of protection afforded to the FSS is a matter for each administration to consider;

d) that although sharing is feasible between earth stations in the FSS and terrestrial stations provided appropriate coordination procedures and/or operational techniques are employed, sharing may in practice become difficult when high geographic densities of such stations are deployed in bands heavily used by either service;

e) that sharing could be facilitated by the adoption of appropriate frequency sub-bands, such as the gaps between the channelling plans recommended by ITU-R for the fixed service;

f) that it may be useful to consider the identification of this spectrum range for high-density fixed service applications,

resolves to request ITU-R

1. to conduct studies in time for the 1999 World Radiocommunication Conference (WRC-99) to determine whether the power flux-density limits included in Article **S21** of the Radio Regulations adequately protect terrestrial services from FSS networks;

2. to conduct other studies leading to technical and operational recommendations to facilitate sharing between terrestrial and space services,

urges administrations

to participate actively in the aforementioned studies by submitting contributions to ITU-R,

requests

WRC-99 to consider the identification of spectrum in the band 37-40 GHz for high-density applications in the fixed service.

RESOLUTION 134 (WRC-97)

Use of the frequency band 40.5-42.5 GHz by the fixed-satellite service

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that this Conference has added a primary allocation to the fixed-satellite service (FSS) (space-to-Earth) in Regions 2 and 3 and in certain countries in Region 1 and to the fixed service in the band 40.5-42.5 GHz;

b) that sharing criteria for the use of the band 40.5-42.5 GHz by the FSS have not been studied by ITU-R,

recognizing

that Resolution **129 (WRC-97)** invites ITU-R to undertake, as a matter of urgency, studies of appropriate criteria and methodologies for sharing between the FSS and the other services with allocations in the band 40.5-42.5 GHz,

resolves

1. that the date of the provisional application of the allocation to the FSS in Regions 1 and 3 in the band 40.5-42.5 GHz is 1 January 2001;

2. that the 1999 World Radiocommunication Conference should review this allocation, including the date of 1 January 2001, taking full account of the requirements of the other services to which the band is allocated and available ITU-R studies.

RESOLUTION 212 (Rev.WRC-97)

Implementation of International Mobile Telecommunications-2000 (IMT-2000)*

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that ITU-R has recommended the 1-3 GHz band as the most suitable for IMT-2000;

b) that ITU-R has recommended approximately 60 MHz for use by personal stations and approximately 170 MHz for use by mobile stations;

c) that ITU-R has recognized that space techniques are an integral part of IMT-2000;

d) that, in No. **S5.388** of the Radio Regulations, this Conference has identified bands to accommodate this future service,

considering further

a) that ITU-R has not completed its studies regarding duplexing methods, modulation techniques, channelling arrangements, signalling or communication protocols;

b) that no worldwide intersystem numbering plan currently exists that would facilitate worldwide roaming,

noting

a) that the implementation of the terrestrial component of IMT-2000 in the bands 1 885-2 025 MHz and 2 110-2 200 MHz is expected to commence around the year 2000, subject to market and technical considerations;

---

*IMT-2000 was previously known as Future Public Land Mobile Telecommunication Systems (FPLMTS).

b) that the availability of the satellite component of IMT-2000 in the bands 1 980-2 010 MHz and 2 170-2 200 MHz simultaneously with the terrestrial component of IMT-2000 in the bands identified in No. **S5.388** would improve the overall implementation and the attractiveness of IMT-2000 to both developed and developing countries,

invites administrations

to give due consideration to the accommodation of other services currently operating in these bands when implementing IMT-2000,

invites ITU-R

to continue its studies with a view to developing suitable and acceptable technical characteristics for IMT-2000 that will facilitate worldwide use and roaming, and ensure that IMT-2000 can also meet the telecommunication needs of the developing countries and rural areas,

invites ITU-T

a) to complete its studies of signalling and communication protocols;

b) to develop a common worldwide intersystem numbering plan and associated network capabilities that will facilitate worldwide roaming,

resolves

that administrations which implement IMT-2000:

a) should make the necessary frequencies available for system development;

b) should use those frequencies when IMT-2000 is implemented;

c) should use the relevant international technical characteristics, as identified by ITU-R and ITU-T Recommendations.

RESOLUTION 214 (Rev.WRC-97)

Sharing studies relating to consideration of the allocation of bands below 1 GHz to the non-geostationary mobile-satellite service

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the agenda of this Conference included consideration of additional allocations on a worldwide basis for the non-geostationary mobile-satellite service (non-GSO MSS) below 1 GHz;

b) that the Conference Preparatory Meeting 1997, in its Report, indicated that for the non-GSO MSS below 1 GHz there is not enough spectrum currently allocated to allow development of all the systems currently in coordination, and that, in order to meet projected MSS requirements below 1 GHz, a range of an additional 7 to 10 MHz will be required in the near future although, as well, it recognized that a number of these systems may not be implemented for reasons not connected with spectrum availability;

c) that there is an urgent need to make usable spectrum available on a worldwide basis for non-GSO MSS systems operating below 1 GHz;

d) that some non-GSO MSS systems are already operated by some administrations in existing MSS allocations and are at an advanced stage of consideration for operation in many other administrations, and that studies have been conducted within ITU-R on sharing between non-GSO MSS and certain terrestrial services which demonstrate the feasibility of sharing in the cases studied;

e) that issues concerning the technical and operational means to facilitate sharing between the terrestrial services and non-GSO MSS in the bands below 1 GHz remain to be studied;

f) that the requirements for the introduction of these new technologies have to be balanced with the needs of other services having allocations below 1 GHz;

g) that the bands below 1 GHz are extensively used by administrations for many services, although the extent to which they are used by each administration varies throughout the world,

noting

a) that additional studies may identify other bands below 1 GHz which could also be considered suitable for a worldwide allocation to non-GSO MSS;

b) that, based on the sharing techniques being developed for MSS below 1 GHz and the current use of the band 138-470 MHz by terrestrial services, this range may be considered for further study;

c) that constraints on the duration of any single transmission from an individual MSS mobile earth station and constraints on the period between consecutive transmissions from an individual MSS mobile earth station operating on the same frequency may facilitate sharing with terrestrial services;

d) that interference mitigation techniques, such as the dynamic channel activity assignment system described in Recommendation ITU-R M.1039-1, may be used by non-GSO MSS systems below 1 GHz in the Earth-to-space direction to promote compatibility with terrestrial systems when operating in the same frequency band;

e) that new technologies employed by some radiocommunication services, especially within the terrestrial mobile and broadcasting services, which require spectrum below 1 GHz, may have an impact on the sharing possibilities;

f) that non-GSO MSS systems operating below 1 GHz have undergone advance publication by the Radiocommunication Bureau and that administrations may seek to implement further such systems;

g) that there may be a need to review constraints on the current allocations to the MSS below 1 GHz,

resolves

1. that further studies are urgently required on operational and technical means to facilitate sharing between the non-GSO MSS and other radiocommunication services having allocations and operating below 1 GHz;

2. that the 1999 World Radiocommunication Conference (WRC-99) be invited to consider, on the basis of the results of the studies conducted within ITU-R and the studies referred to in *resolves* 1. above, additional allocations on a worldwide basis for the non-GSO MSS below 1 GHz;

3. that relevant entities and organizations be invited to participate in these sharing studies;

4. that WRC-99 be invited to consider a review of the technical and regulatory constraints on non-GSO MSS allocations in the bands below 1 GHz, taking into account *considering d)*,

invites ITU-R

1. to study and develop Recommendations on, as a matter of urgency, the performance requirements, sharing criteria and technical and operational issues relating to sharing between both existing and planned services and non-GSO MSS below 1 GHz;

2. as a matter of urgency, to carry out studies in preparation for WRC-99, including a review of the operating constraints referred to in *noting c)* necessary to protect the existing and planned development of all of the services to which the bands below 1 GHz are allocated, having regard to *noting d)*;

3. as a matter of urgency, to carry out studies in preparation for WRC-99 with respect to interference mitigation techniques, such as the dynamic channel activity assignment system described in Recommendation ITU-R M.1039-1, necessary to permit the continued development of all of the services to which the bands are allocated;

4. to carry out a review for a future competent conference of the technical and regulatory constraints on non-GSO MSS allocations in the bands below 1 GHz, having regard to *considering d)*;

5. to bring the results of these studies to the attention of WRC-99 and the relevant preparatory meetings,

urges administrations

1. to participate actively in these studies, with the involvement of both terrestrial and satellite interests;

2. to submit to ITU-R reports on their technical studies and on their operational and frequency sharing experience with non-GSO MSS systems operating below 1 GHz,

encourages administrations

to consider the use of dynamic channel assignment techniques, such as those described in Recommendation ITU-R M.1039-1.

RESOLUTION 215 (Rev.WRC-97)

Coordination process among mobile-satellite systems and efficient use of the allocations to the mobile-satellite service in the 1-3 GHz range

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that space-to-Earth transmissions of mobile-satellite systems are constrained to limit their power flux-density over areas where the frequency band is shared with terrestrial systems;

b) that a number of proposed mobile-satellite systems can provide a good service to users within the power flux-density limits given in Annex 2 to Resolution **46 (Rev.WRC-97)**/Annex 1 to Appendix **S5** to the Radio Regulations;

c) that when maximum communication capacity is achieved by systems in the mobile-satellite service (MSS) a major portion of the interference into each of these systems will come from the other mobile-satellite systems sharing the frequency band, and, consequently, if one system starts to transmit at higher power, all others need to do the same in order to overcome mutual interference;

d) that ITU-R is studying the efficient use of the radio spectrum and frequency sharing within the MSS, that Recommendations ITU-R M.1186 and ITU-R M.1187 are a basis for further study, and that additional preliminary texts are available or can be provided by administrations on this matter;

e) that, in a codirectional, co-frequency and co-coverage sharing environment, capacities of systems using spread-spectrum multiple-access

techniques are affected by technical and operational characteristics of other MSS systems using similar multiple-access techniques;

f) that in many parts of the world and in certain frequency bands in the 1-3 GHz range, significant congestion already exists due to use by other terrestrial and space services;

g) the need to make most efficient use of frequencies in the MSS allocations,

recognizing

that, as a means to ensure that the frequency bands allocated to the MSS can be used in an efficient manner, there is an urgent demand for:

a) criteria to be established by ITU-R to be used in determining the need to coordinate between mobile-satellite systems; and

b) detailed methods of interference calculation to be used by administrations in the coordination process;

c) ITU-R studies which should not impede the timely deployment of any MSS systems,

resolves to invite ITU-R

1. to continue its studies on this subject and develop, as a matter of urgency, criteria for determining the need to coordinate and calculation methods for determining levels of interference, as well as the required protection ratios between MSS networks;

2. to study, as a matter of urgency, the use of technically and operationally feasible techniques to allow for improvements in spectrum efficiency in MSS systems,

further resolves

1. that ITU-R studies should be focused on the technical and operational characteristics of systems using spread-spectrum multiple-access techniques that can allow co-frequency, co-coverage, codirectional sharing but which

involve cooperation among systems' operators to maximize the efficient use of spectrum by multiple MSS systems using such access techniques;

2. that administrations responsible for the introduction of mobile-satellite systems are urged to implement, as practicable, the latest available technologies to improve spectrum efficiency consistent with the requirement to offer viable MSS services;

3. to recommend that administrations be encouraged to use the most advanced technology available when preparing to implement their global MSS systems in the 1-3 GHz range so that they may operate, if necessary, in different frequency bands in different regions, in accordance with the MSS allocations in the 1-3 GHz range decided by this Conference.

RESOLUTION 216 (WRC-97)

Possible broadening of the secondary allocation to the mobile-satellite service (Earth-to-space) in the band 14-14.5 GHz to cover aeronautical applications

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the band 14-14.5 GHz was allocated to the land mobile-satellite service (Earth-to-space) on a secondary basis prior to this Conference;

b) that this Conference replaced this by an allocation to the mobile-satellite service (Earth-to-space) except aeronautical mobile-satellite, on a secondary basis;

c) that the band 14-14.5 GHz is also allocated to the fixed-satellite (Earth-to-space), radionavigation, fixed and mobile, except aeronautical mobile, services;

d) that there is a demand for use on board aircraft, in order to provide location and two-way messaging functions, of the same type of terminals now used for land and maritime applications;

e) that such demand justifies the consideration of possible broadening of the allocation to include aeronautical applications at a future competent conference;

f) that studies on the feasibility of such a broadening of the allocation must be completed before the aforementioned competent conference, with the participation of relevant entities and organizations;

g) that Recommendation **34 (WRC-95)** states that future world radiocommunication conferences, whenever possible, should allocate frequency bands to the most broadly defined services with a view to providing maximum flexibility in spectrum use,

resolves

that the 1999 World Radiocommunication Conference (WRC-99) should examine the possibility of broadening the secondary allocation to the mobile-satellite service (Earth-to-space) except aeronautical mobile-satellite in the 14-14.5 GHz band to include aeronautical use, subject to the satisfactory outcome of technical compatibility studies,

invites ITU-R

to complete in time for WRC-99 the technical and operational studies on the feasibility of sharing of the band 14-14.5 GHz between the services referred to in *considering c)* above and the aeronautical mobile-satellite service, with the latter service on a secondary basis,

instructs the Director of the Radiocommunication Bureau

to invite relevant entities and organizations to participate in these studies.

RESOLUTION 217 (WRC-97)

Implementation of wind profiler radars

The World Radiocommunication Conference (Geneva, 1997),

having noted

a request to ITU from the Secretary-General of the World Meteorological Organization (WMO), in May 1989, for advice and assistance in the identification of appropriate frequencies near 50 MHz, 400 MHz and 1 000 MHz in order to accommodate allocations and assignments for wind profiler radars,

considering

a) that wind profiler radars are vertically-directed Doppler radars exhibiting characteristics similar to radiolocation systems;

b) that wind profiler radars are important meteorological systems used to measure wind direction and speed as a function of altitude;

c) that it is necessary to use frequencies in different ranges in order to have options for different performance and technical characteristics;

d) that, in order to conduct measurements up to a height of 30 km, it is necessary to allocate frequency bands for these radars in the general vicinity of 50 MHz (3 to 30 km), 400 MHz (500 m to about 10 km) and 1 000 MHz (100 m to 3 km);

e) that some administrations have either already deployed, or plan to expand their use of, wind profiler radars in operational networks for studies of the atmosphere and to support weather monitoring, forecasting and warning programmes;

f) that the ITU radiocommunication study groups have studied the technical and sharing considerations between wind profiler radars and other services allocated in bands near 50 MHz, 400 MHz and 1 000 MHz,

considering further

a) that some administrations have addressed this matter nationally by assigning frequencies for use by wind profiler radars in existing radiolocation bands or on a non-interference basis in other bands;

b) the work of the Voluntary Group of Experts on the Allocation and Improved Use of the Radio Frequency Spectrum and Simplification of the Radio Regulations supports increased flexibility in the allocation of frequency spectrum,

noting in particular

a) that wind profiler radars operating in the meteorological aids service in the band 400.15-406 MHz interfere with satellite emergency position-indicating radio beacons operating in the mobile-satellite service in the band 406-406.1 MHz under No. **S5.266** of the Radio Regulations;

b) that in accordance with No. **S5.267** of the Radio Regulations, any emission capable of causing harmful interference to the authorized uses of the band 406-406.1 MHz is prohibited,

resolves

1. to urge administrations to implement wind profiler radars as radiolocation service systems in the following bands, having due regard to the potential for incompatibility with other services and assignments to stations in

these services, thereby taking due account of the principle of geographical separation, in particular with regard to neighbouring countries, and keeping in mind the category of service of each of these services:

46-68 MHz in accordance with No. **S5.162A** of the Radio Regulations

440-450 MHz

470-494 MHz in accordance with No. **S5.291A** of the Radio Regulations

904-928 MHz in Region 2 only

1 270-1 295 MHz

1 300-1 375 MHz;

2. that, in case compatibility between wind profiler radars and other radio applications operating in the band 440-450 MHz or 470-494 MHz cannot be achieved, the bands 420-435 MHz or 438-440 MHz could be considered for use;

3. to urge administrations to implement wind profiler radars in accordance with Recommendations ITU-R M.1226, ITU-R M.1085-1 and ITU-R M.1227 for the frequency bands around 50 MHz, 400 MHz and 1 000 MHz, respectively;

4. to urge administrations not to implement wind profiler radars in the band 400.15-406 MHz;

5. to urge administrations currently operating wind profiler radars in the band 400.15-406 MHz to discontinue them as soon as possible,

instructs the Secretary-General

to bring this Resolution to the attention of the International Civil Aviation Organization (ICAO), International Maritime Organization (IMO) and WMO.

RESOLUTION 218 (WRC-97)

Use of the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz by the mobile-satellite service

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that this Conference allocated the bands 1 525-1 559 MHz (space-to-Earth) and 1 626.5-1 660.5 MHz (Earth-to-space) to the mobile-satellite service (MSS) to facilitate the assignment of spectrum to multiple mobile-satellite systems in a flexible and efficient manner;

b) that prior to this Conference there was a generic allocation by footnote provisions in some countries for the use of the bands 1 530-1 544 MHz and 1 631.5-1 645.5 MHz by the MSS, on condition that maritime mobile-satellite distress and safety communications have priority access over all other communications;

c) that prior to this Conference, there was a generic allocation by two footnotes for the use of the bands 1 555-1 559 MHz and 1 656.5-1 660.5 MHz by the MSS, and in one of these footnotes the following conditions applied in two countries:

– the aeronautical mobile-satellite (R) service has priority access and immediate availability over all other communications within a network;

– mobile-satellite systems should be interoperable with the aeronautical mobile-satellite (R) service;

– account shall be taken of the priority of safety-related communications in the other mobile-satellite services;

d) that there is at least one global mobile-satellite system that is capable of providing global maritime mobile-satellite distress and safety communications according to Article **S53** of the Radio Regulations and global aeronautical mobile-satellite (R) service communications with priorities 1 to 6

of Article **S44** of the Radio Regulations in accordance with the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO) requirements;

e) that technical considerations for sharing satellite network resources between MSS (other than aeronautical mobile-satellite (R) service) and aeronautical mobile-satellite (R) service have been developed by ITU-R (see Recommendation ITU-R M.1233);

f) that global and regional mobile-satellite systems are being multilaterally coordinated in the bands 1 525-1 559 MHz (space-to-Earth) and 1 626.5-1 660.5 MHz (Earth-to-space) and that the ITU Radio Regulations provide the international framework for multilateral agreements;

g) that in Nos. **S5.357A** and **S5.353A** of the Radio Regulations priority has been given to accommodating the spectrum requirements for distress, urgency and safety communications of the Global Maritime Distress and Safety System (GMDSS) and aeronautical mobile-satellite (R) service communications with priorities 1 to 6 of Article **S44**. See No. **S9.11A**, except No. **S9.13** of the Radio Regulations,

further considering

a) that the Convention on International Civil Aviation requires that stations of the aeronautical mobile-satellite (R) service shall be in compliance with the internationally agreed Standards and Recommended Practices (SARP) and Procedures for Air Navigation Services (PANS);

b) that the ICAO has developed a global Air Traffic Management (ATM) system which requires interoperability between stations operating in accordance with the ICAO Convention for those mobile-satellite systems providing aeronautical mobile-satellite (R) service communications with the priority message structure of Article **S44**;

c) that this Conference modified provisions for the operational use of the GMDSS which is fully defined in the International Convention for the Safety

of Life at Sea (SOLAS), 1974, as amended (see No. **S30.1** of the Radio Regulations);

d) that the IMO may also place similar requirements of interoperability for those mobile-satellite systems providing GMDSS communications with the priority message structure of Article **S53**,

recognizing

that Table S15-2 of Appendix **S15** to the Radio Regulations identifies the bands 1 530-1 544 MHz (space-to-Earth) and 1 626.5-1 645.5 MHz (Earth-to-space) for distress and safety purposes in the maritime mobile-satellite service as well as for routine non-safety purposes,

noting

that some countries in Region 2 use the bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 626.5-1 645.5 MHz and 1 646.5-1 660.5 MHz to provide national MSS on a generic basis and, where agreements with other administrations concerned are in place, provide multinational service,

resolves

1. that the future spectrum requirements for the provision of distress, urgency and safety communications in the GMDSS by the mobile-satellite service and aeronautical mobile-satellite (R) service communications with priority 1 to 6 of Article **S44** should take into account internationally agreed assumptions and methodologies and information on actual GMDSS and aeronautical mobile-satellite (R) service communication traffic usage and growth;

2. that the feasibility of prioritization, real-time pre-emptive access and, if necessary, interoperability between different mobile-satellite systems for GMDSS and aeronautical mobile-satellite (R) service should be determined, in order to achieve the most flexible and practical use of the generic allocations,

requests ITU-R

1. to develop assumptions and methodologies and gather information on actual GMDSS and aeronautical mobile-satellite (R) service communication traffic usage and growth, in order to determine the future spectrum requirements for the provision of distress, urgency and safety communications in the GMDSS by the mobile-satellite service and aeronautical mobile-satellite (R) service communications with priority 1 to 6 of Article **S44**;

2. to determine the feasibility of prioritization, real-time pre-emptive access and, if necessary, interoperability between different mobile-satellite systems for GMDSS and aeronautical mobile-satellite (R) service, in order to achieve the most flexible and practical use of the generic allocations;

3. to complete and report the results of the studies called for in *requests ITU-R* 1. and 2. above by the 1999 World Radiocommunication Conference or a future competent conference,

requests the next competent world radiocommunication conference

to take into account the outcome of ITU-R studies and take appropriate action on this subject,

invites

ICAO, IMO, International Association of Lighthouse Authorities (IALA), administrations and other organizations concerned to participate in the studies identified in *requests ITU-R* 1. and 2. above.

RESOLUTION 219 (WRC-97)

Studies relating to consideration of the allocation to the non-geostationary mobile-satellite service in the meteorological aids band 405-406 MHz and the impact on primary services allocated in the adjacent bands

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that there is a significant shortfall of spectrum for the non-geostationary (non-GSO) mobile-satellite service (MSS) below 1 GHz, and there is an urgent need to make additional spectrum available on a worldwide basis for such non-GSO MSS systems;

b) that the Report of the 1997 Conference Preparatory Meeting (CPM-97) to this Conference states that the Radiocommunication Bureau (BR) has identified 23 non-GSO MSS networks, at frequencies below 1 GHz, at some state of coordination under Resolution **46**/No. **S9.11A** of the Radio Regulations, that it is likely that a number of these systems may not be implemented for reasons not connected with spectrum availability and that several administrations have indicated in their information submitted to BR that they plan on implementing these non-GSO MSS systems by the year 2002 or earlier;

c) that the CPM-97 Report to this Conference also states that it appears that many of the proposed networks cannot be implemented in the existing allocations because there is not enough spectrum to allow the development of all of these systems in an economically viable manner;

d) that meteorological aids systems are essential to produce the upper air measurements required by the World Meteorological Organization (WMO), as summarized in Recommendation ITU-R SA.1165, and that systems using the band 400.15-406 MHz constitute the majority of the mobile and fixed observation stations worldwide;

e) that meteorological aids systems are also essential to produce the upper air measurements required for civilian and other applications;

f) that the amount of spectrum required by meteorological users, including WMO (station spacing requirement of 250 km), civilian users and other related users, in most geographical areas is about 5 MHz in the band 401-406 MHz using the currently employed technology;

g) that since this Conference upgraded the allocation to the earth exploration-satellite service and the meteorological-satellite service to primary in the band 401-403 MHz, this is likely to impose constraints on the meteorological aids service in this band in certain geographical areas;

h) that the development of more spectrum-efficient meteorological aids systems is continuing in order to minimize the bandwidth required by these systems, as outlined in Recommendation ITU-R SA.1165, and that recent development of these related technologies has been rapid;

i) that sharing studies to date have shown that co-channel sharing between currently proposed non-GSO MSS systems and meteorological aids in the band 401-406 MHz is not generally feasible, that any sharing would require band segmentation and that the band 405-406 MHz has been named by some administrations as a possible candidate band for such a new allocation;

j) that any transition of meteorological aids from the band 405-406 MHz should not increase the operational costs of meteorological aids networks beyond the available financial resources, and should not constrain the future development of the meteorological aids service, while using more spectrum-efficient systems;

k) that the COSPAS-SARSAT system operates within an exclusive allocation in the band 406-406.1 MHz, that the radio astronomy service has a primary allocation in the band 406.1-410 MHz and that these services need to be protected from MSS transmissions including unwanted emissions,

noting

a) that the possible use of the band 405-406 MHz by the MSS should be limited to systems using narrow-band modulation techniques until further ITU-R studies conclude that other modulation techniques can protect COSPAS-SARSAT (406-406.1 MHz) and the radio astronomy service (406.1-410 MHz);

b) that Resolution **214 (Rev.WRC-97)** also addresses sharing studies relating to consideration of the allocation of bands below 1 GHz to the non-GSO MSS,

resolves to invite ITU-R

1. as a matter of urgency, with the participation of WMO, to assess further the current and future requirements of the meteorological aids service in the band 401-406 MHz, taking into account the requirements of the earth exploration-satellite service and the meteorological-satellite service in the band 401-403 MHz;

2. as a matter of urgency, with the participation of WMO, to consider the possible transition of the meteorological aids service out of the band 405-406 MHz, which would minimize the impact on the meteorological aids service, while taking into account requirements for the implementation of non-GSO MSS;

3. to consider, based on the outcome of 1. and 2. above, a possible transition plan, including a transition date at which time meteorological aids could migrate their operations out of the band 405-406 MHz and MSS operations could commence;

4. as a matter of urgency, to study, with the participation of the Inter-Union Commission on Frequency Allocations for Radio Astronomy and Space Science (IUCAF) and other relevant entities, the impact of unwanted emissions on the COSPAS-SARSAT system in the band 406-406.1 MHz and the radio astronomy service in the band 406.1-410 MHz, and identify appropriate protection measures for these services,

resolves

that the 1999 World Radiocommunication Conference be invited to consider, based on the outcome of *resolves to invite ITU-R* above, the possibility of allocating the band 405-406 MHz to the MSS, including any appropriate transition plan,

urges administrations

1. to assess their current and future requirements for meteorological aids systems in the band 401-406 MHz taking into account the requirements of the earth exploration-satellite service and the meteorological-satellite service in the 401-403 MHz band;

2. to, either individually or on a subregional or regional basis, report to WMO and ITU-R on whether the whole of the band 401-406 MHz will be needed for meteorological aids, and the possibility of transition out of the band 405-406 MHz;

3. to submit to ITU-R the most up-to-date information on their plans for possible implementation of non-GSO MSS systems and the associated spectrum requirements,

instructs the Secretary-General

to bring this Resolution to the attention of WMO.

RESOLUTION 220 (WRC-97)

Studies to consider the feasibility of use of a portion of the band 1 559-1 610 MHz by the mobile-satellite service (space-to-Earth)

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the band 1 559-1 610 MHz is allocated on a primary basis to the aeronautical radionavigation and radionavigation-satellite services;

b) that proposals were made to this Conference for an allocation to the mobile-satellite service (MSS) in the band 1 559-1 567 MHz;

c) that the aeronautical radionavigation and radionavigation-satellite services are safety services in the space-to-Earth direction and must be protected from harmful interference (No. **S4.10** of the Radio Regulations applies);

d) that studies carried out by some administrations indicate that an aggregate power flux-density limit at the Earth's surface of –112 dB(W/m^2/1 MHz) for all angles of arrival from the MSS space station is appropriate for the protection of aeronautical radionavigation and radionavigation-satellite services;

e) that other administrations have conducted studies and have concluded that the power flux-density referred to in *considering d)* does not provide protection for the aeronautical radionavigation and radionavigation-satellite service;

f) that studies have not been conducted in ITU-R on the sharing possibilities between the MSS and the aeronautical radionavigation or radionavigation-satellite services in the 1 559-1 610 MHz band;

g) that the band 1 559-1 610 MHz is used by the global positioning system (GPS) and global orbiting navigation satellite system (GLONASS) radionavigation-satellite systems and their augmentations, and that these systems are components of the International Civil Aviation Organization (ICAO) global navigation satellite system (GNSS);

h) that the International Maritime Organization (IMO) has recognized GPS and GLONASS as elements of their GNSS;

i) that the aeronautical radionavigation and radionavigation-satellite systems are evolutionary systems and that other GNSSs are under development for operation in the band 1 559-1 610 MHz;

j) that studies are currently being conducted in ITU-R for use in the radionavigation-satellite service in the space-space direction,

recognizing

1. the essential need to protect systems operating in the aeronautical radionavigation and radionavigation-satellite service in the band 1 559-1 610 MHz;

2. the requirement for additional spectrum for the MSS;

3. that Resolution **213 (Rev.WRC-95)** identifies the possible use in parts of the band 1 675-1 710 MHz in the Earth-to-space direction and invites ITU-R to investigate potentially suitable downlink bands that may assist in meeting the requirements of the MSS,

resolves to request ITU-R

to study, as a matter of urgency, the technical criteria and operational and safety requirements to determine if sharing between the aeronautical radionavigation and radionavigation-satellite services operating, or planned to operate, in the band 1 559-1 610 MHz, and the MSS in a portion of the 1 559-1 567 MHz frequency range, is feasible, taking into account the above *recognizing*,

further resolves

1. to instruct the Director of the Radiocommunication Bureau to facilitate to the greatest extent possible, the completion of these studies in time for consideration by the 1999 World Radiocommunication Conference (WRC-99);

2. to recommend that WRC-99 take into account the results of ITU-R studies in evaluating the feasibility of an allocation in the space-to-Earth direction to the MSS in a portion of the 1 559-1 567 MHz frequency range;

3. to urge all administrations and concerned organizations, including ICAO, the International Association of Lighthouse Authorities (IALA) and IMO, to contribute to these studies and cooperate to the maximum extent possible, to ensure a mutually satisfactory result is presented to WRC-99.

RESOLUTION 310 (Rev.WRC-97)

Frequency provisions for development and future implementation of ship movement telemetry, telecommand and data exchange systems

The World Radiocommunication Conference (Geneva, 1997),

considering

a) the need to specify radio frequencies which may be used by the maritime mobile service on a worldwide basis for ship movement requirements including transmission of electronic nautical chart data corrections, using digital automated data exchange, telemetry and telecommand techniques;

b) the developments now in progress in different portions of the frequency spectrum which will require common frequency bands in the future for efficient frequency utilization;

c) the importance of these systems in the safe and efficient operations of ships;

d) the advantages to port authorities for safe and efficient port management and operations;

noting

a) that ITU-R is considering this matter, particularly within its Question ITU-R 55/8;

b) that further operational and technical information is needed in deciding the most effective frequency utilization and sharing criteria;

c) that the International Maritime Organization (IMO) has identified a need for data exchange, using digital transmission techniques, between shore and ship for ship position and movement data, correction data of radio-navigation systems and electronic nautical charts,

resolves

that a future competent world radiocommunication conference should review possible frequency provisions in the light of additional studies,

requests administrations

to review the requirements relating to future ship movement telemetry, telecommand and data exchange systems and submit relevant results to ITU-R,

invites ITU-R

to examine and advise on modulation techniques such as spread spectrum, frequency bands, bandwidths and data formats in coordination with administrations developing and testing these digital transmission systems;

invites the Council

to include this Resolution in the agenda of a forthcoming competent world radiocommunication conference;

instructs the Secretary-General

to communicate this Resolution to IMO and the International Hydrographic Organization (IHO).

RESOLUTION 312 (Rev.WRC-97)

Calling procedures for HF A1A and A1B Morse telegraphy

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that there is a need for more effective utilization of the radio frequency spectrum and of the time of operational personnel on board ships;

b) that it is desirable to continue to improve the effectiveness of calling in the HF A1A and A1B Morse telegraphy bands;

c) that the World Maritime Administrative Radio Conference, Geneva, 1974, adopted a new calling procedure for the HF A1A Morse telegraphy bands (Article **S52** and Appendix **S17** (Part B, Section IV));

d) that the effectiveness of the new calling procedure requires agreement between administrations with respect to the groups specified in Appendix **S17** (Part B, Section IV) in accordance with a planned distribution of coast stations on a regional and traffic basis;

e) that the administrations at the 1974 Conference agreed to the Distribution Plan of Coast Stations (annexed to this Resolution) arranged by countries and areas into four groups to ensure a better distribution of calls;

invites

administrations which are providing an international public correspondence service to indicate for publication in the List of Coast Stations the periods of service during which watch will be maintained on the common, and if necessary the group, channel or channels;

invites further

administrations which wish to enter into a group in the Distribution Plan, or administrations included in the Plan wishing to make a modification in the Plan, to coordinate as far as possible their proposed changes with other interested and affected administrations which are designated in the group concerned. An administration which has decided to enter into a group or change from a designated group in the Distribution Plan shall inform the Secretary-General of its decision and it shall be published in the Annex to the List of Coast Stations;

instructs the Secretary-General

to update, as necessary, the Distribution Plan annexed to the List of Coast Stations.

ANNEX TO RESOLUTION 312 (Rev.WRC-97)

Distribution plan for group channels HF A1A Morse coast stations by countries and areas[1]

Group 1		Group 2		Group 3		Group 4	
AGL	MAU	ALG	GRC	ALS	MOZ	AFS	POR
AZE	MDG	ATN	HKG	ARG	MRA	ALB	PTC
AZR	MRT	ARS W[4]	HNG	BRM	MRC	ARS E[8]	RUS AN
B	NCG	BEL	HOL	CAN CL[7]	NIG	AUS	RUS EO
BAH	NCL	BEN	I	CAN E[7]	NOR	BUL	RUS NW
BER	OCE	BRB	KOR	CAN NE[7]	NRU	CHN[9]	RUS SW
BGD	OMA	CBG	LBN	CHN	PAK	COD	RUS W
BHR	PHL	CHR	MEX	DNK	RUS EO	E	SEN
CAN W[2]	PTR	CKH	MRT	EST	RUS NW	FJI	SEY
CAN NW[2]	REU	CLM	NCL	FIN	RUS SW	GEO	SLM
CHL	ROU	CLN	OCE	GEO	RUS W	GNE	SMA
CNR	RUS AS	CME	PNR	GHA	S	IND E	SRL
CTI	SNG	COG	POL	GNB	SVN	INS	SUR
DJI	STP	CPV	PRG	GUI	TRD	IRQ	SYR
EQA	SUI	CTR	PRU	GUM	TUR	J	TGO
ERI	TKM	CUB	REU	GUY	UKR	JOR	TUN
ETH	UKR	CYP	RUS NW	HRV	USA W	KWT	UKR
F	USA E[3]	CZE	RUS EO	HWA	VEN	LVA	URG
G	VUT	DOM	SDN	IRN	YUG	LTU	VTN
IND W		EGY	SVK	ISL		MAU	YEM
IRL		F	THA	JMC		MDA	
ISR		FLK	USA SO[6]	LBY		MLA	
KEN		G[5]	VUT	LTU		MLT	
KRE		GAB	YEM	LVA		NZL	
LBR		GMB		MDR		PNG	

NOTES:

1 The meaning of the symbols is given in Tables B1 and 4E1 of the Preface to the International Frequency List and the Weekly Circular.

2 Canada (West Coast and Western Arctic).

3 United States (East Coast).

4 Saudi Arabia (West).

5 22 MHz only.

6 United States (Gulf of Mexico Coast).

7 Canada (East Coast and Eastern Arctic).

8 Saudi Arabia (East).

9 China (Province of Taiwan).

RESOLUTION 331 (Rev.WRC-97)

Transition to the Global Maritime Distress and Safety System (GMDSS) and continuation of the distress and safety provisions in Appendix S13

The World Radiocommunication Conference (Geneva, 1997),

noting

that the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, prescribes that all ships subject to this Convention shall be fitted for the Global Maritime Distress and Safety System (GMDSS) by 1 February 1999,

noting further

a) that a number of administrations have taken steps to implement the GMDSS also for classes of vessels not subject to SOLAS, 1974, as amended;

b) that an increasing number of vessels not subject to SOLAS, 1974, as amended, are making use of the techniques and frequencies of the GMDSS prescribed in Chapter **SVII**;

c) that some administrations and vessels, not subject to SOLAS, 1974, as amended, may wish to continue to use provisions of Appendix **S13** for distress and safety communications for some time after 1 February 1999;

d) that it would be costly for administrations to maintain in parallel for an excessive period of time shore-based facilities necessary to support both the old and new distress and safety systems;

e) that there may be a need to continue existing shore-based distress and safety services for a certain period after 1 February 1999 so that vessels not subject to the 1974 SOLAS Convention and not yet using the techniques and frequencies of the GMDSS will be able to obtain assistance from these services until such time as they are able to participate in the GMDSS;

f) that separate provisions of the existing Radio Regulations designate VHF channel 16 and the frequency 2 182 kHz as the international channels for general calling by radiotelephony;

g) that IMO has already decided for GMDSS vessels that:

– listening watches on 2 182 kHz will no longer be mandatory after 1 February 1999;

– listening watches on VHF channel 16 will be continued and that a final date for the cessation of mandatory watchkeeping on channel 16 is yet to be determined;

h) that the Radio Regulations require GMDSS ships to keep watch on the appropriate DSC distress frequencies;

i) that the Radio Regulations establish that ship stations should, when practicable, keep watch on VHF channel 13;

j) that several administrations have established Vessel Traffic Service (VTS) systems and require their ships to keep watch on local VTS channels;

k) that ships that are required by SOLAS to carry a radio station are being equipped with DSC, but the majority of vessels that carry a radio station on a voluntary basis might not have DSC equipment;

l) that similarly, many administrations have established distress and safety service based on DSC watchkeeping, but the majority of port stations, pilot stations and other operational coast stations have not been equipped with DSC facilities;

m) that for the reasons listed above, it will remain necessary for some stations in the maritime mobile service to call each other by radiotelephony in certain situations,

considering

a) that the operation of the GMDSS described in Chapter **SVII** and the present distress and safety system described in Appendix **S13** differ in many crucial aspects, such as means and methods of alerting, communication facilities available, announcement and transmission of maritime safety information, etc.;

b) that operation of the two systems in parallel for a long period would cause ever-increasing difficulties and incompatibilities between ships operating in the two different systems and may thus seriously degrade safety at sea in general;

c) that the GMDSS overcomes the deficiencies of the aural watch-keeping on maritime distress and calling frequencies on which the distress and safety system described in Appendix **S13** relies, by replacing these watches by automatic watch, i.e. digital selective calling and satellite communication systems,

resolves

1. that, until such time as voice calling has become obsolete, VHF channel 16 and the frequency 2 182 kHz may be used as voice-calling channels;

2. to urge all administrations to assist in enhancing safety at sea by:

– encouraging all ships to make use of the GMDSS as soon as possible;

– encouraging, where appropriate, establishment of suitable shore-based facilities for GMDSS, either on an individual basis or in cooperation with other relevant parties in the area;

3. that administrations may, taking account of all aspects involved, such as:

– decisions by IMO on aural watch on 2 182 kHz and VHF channel 16;

– the GMDSS radio systems available in the area concerned;

– the compatibility problems mentioned in *considering a)* and *b)* above;

– the density and classes of ships normally in the area;

– the geographical nature of the area and general navigational conditions within the area;

– other adequate measures taken to ensure safety communications for ships sailing in the area,

at a time after 1 February 1999, when the development on transition to the GMDSS and the prevailing conditions in the area makes it reasonable to do so, release their ship stations and coast stations within the area concerned from the obligations described in Appendix **S13** on listening watch on 2 182 kHz or VHF channel 16 or both;

when doing so, administrations should:

– inform IMO of their decisions and submit to IMO details on the area concerned;

– inform the Secretary-General on the necessary details for inclusion in the List of Coast Stations,

resolves further

that the Secretary-General should ensure that such arrangements and details regarding the area concerned be indicated in relevant maritime publications,

invites the next world radiocommunication conference

to include the review of this Resolution, Appendix **S13** and Chapter **SVII** on the agenda of the 2001 World Radiocommunication Conference,

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO),

invites ITU-R Study Group 8

to review the operational and procedural incompatibilities between the old and new systems with a view to presenting the information to the 2001 World Radiocommunication Conference.

RESOLUTION 339 (Rev.WRC-97)

Coordination of NAVTEX services

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the International Maritime Organization (IMO) has established a Coordinating Panel on NAVTEX to, *inter alia*, coordinate the operational aspects of NAVTEX services, such as allocation of transmitter identification character (B1) and time schedules, in the planning stages for transmissions on the frequencies 490 kHz, 518 kHz or 4 209.5 kHz;

b) that coordination in the frequencies 490 kHz, 518 kHz and 4 209.5 kHz is essentially operational;

c) that Article **14A** of the Radio Regulations was deleted by the 1995 World Radiocommunication Conference (WRC-95) with effect from 18 November 1995;

d) that the frequency band around 518 kHz is also allocated to the aeronautical radionavigation service on a primary basis;

e) that WRC-95 resolved in its Resolution **23 (WRC-95)** that, with effect from 18 November 1995, the Radiocommunication Bureau shall not examine with respect to Nos. **1241** to **1245** of the Radio Regulations, and shall not apply the related provisions to, frequency assignment notices in the non-planned bands below 28 000 kHz,

resolves

to invite administrations to apply the procedures established by IMO, taking into account the IMO NAVTEX Manual, for coordinating the use of the frequencies 490 kHz, 518 kHz and 4 209.5 kHz,

instructs the Secretary-General

1. to invite IMO to provide ITU with information on a regular basis on operational coordination for NAVTEX services on the frequencies 490 kHz, 518 kHz and 4 209.5 kHz;

2. to publish this information in the List of Coast Stations (see No. **S20.7** of the Radio Regulations).

RESOLUTION 340 (WRC-97)

Need for additional search and rescue information in databases

The World Radiocommunication Conference (Geneva, 1997),

noting

a) that the provisions of No. **S20.16** of Article **S20** of the Radio Regulations require administrations to notify the Radiocommunication Bureau of ship station characteristics contained in the List of Ship Stations (List V), which currently includes: name of ship, call sign, selective call number, country, auxiliary installations, class of ship, nature of service, hours of service, telegraph transmission frequency bands, telephone transmission frequency bands, accounting authority, and remarks (e.g. Inmarsat terminal number, MMSI);

b) that the provisions of No. **S20.15** of the Radio Regulations, however, give the Bureau authority to change the content and form of this information in consultation with administrations; and

c) that administrations and the International Maritime Organization (IMO) have expressed a need for additional information to be included in search and rescue databases, including:

– vessel identification number (IMO number or national registration number);

– name, address and telephone number and, if applicable, telefax number of emergency contact person ashore;

– alternative 24-hour emergency telephone number;

– capacity for persons on board (passengers and crew),

resolves

to instruct the Director of the Radiocommunication Bureau to begin consultations with administrations with a view to incorporating the information contained in the Annex to this Resolution in the ITU maritime services database,

invites

administrations to consider also the incorporation of that information in their national databases,

instructs the Secretary-General

to communicate this Resolution to the IMO.

ANNEX TO RESOLUTION 340 (WRC-97)

Registration database for the Global Maritime Distress and Safety System

(See Article **S32** of the Radio Regulations)

1. All identities used by the Global Maritime Distress and Safety System (GMDSS) for identifying vessels in distress shall be registered in accordance with this Annex. Administrations or organizations responsible for assigning these identities shall make suitable arrangements for ensuring that registrations of these identities are made and maintained. Administrations shall notify this information to the Radiocommunication Bureau in accordance with No. **S20.16** of the Radio Regulations.

2. Means shall be provided by the Radiocommunication Bureau and administrations maintaining national databases to allow rescue coordination centres immediate access to this database on a 24-hour per day, 7-day per week basis.

3. Each registration database should include the following information:

3.1 vessel name;

3.2 maritime mobile service identity (MMSI);

3.3 call sign;

3.4 emergency position indicating radiobeacons (EPIRB) identification code (if applicable);

3.5 country (vessel flag State; may be derived from MMSI and call sign);

3.6 vessel identification number (IMO number or national registration number);

3.7 brief ship description (type);

3.8 name, address, telephone and (if applicable) telefax number of emergency contact person ashore;

3.9 alternative 24-hour emergency telephone number;

3.10 capacity for persons on board (passengers and crew);

3.11 ship’s radio installation (Inmarsat A, B, C, M, VHF DSC, etc.); and

3.12 Inmarsat ship earth station identities (if applicable).

RESOLUTION 341 (WRC-97)

UHF frequencies used in the maritime mobile service for on-board communication

The World Radiocommunication Conference (Geneva, 1997),

considering

that this Conference has adopted the introduction of channel spacing of 12.5 kHz for maritime UHF on-board communications, to be used on a voluntary basis,

noting

that Recommendation ITU-R M.1174 contains the characteristics of equipment used for on-board communications in the bands between 450 MHz and 470 MHz,

resolves to invite ITU-R

to modify this Recommendation by including also the characteristics of the equipment using the new 12.5 kHz channel spacing,

urges administrations

to submit contributions to ITU-R,

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization.

RESOLUTION 342 (WRC-97)

Review of new technology to provide improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the agenda of this Conference included the consideration of the use of Appendix **S18** to the Radio Regulations in respect of maritime mobile communications and the use of new technology for maritime radiotelephony channels;

b) Recommendation **318 (Mob-87)**;

c) that Appendix **S18** to the Radio Regulations identifies frequencies to be used for distress and safety communications on an international basis;

d) that the introduction of new technology in the maritime mobile service shall not disrupt distress and safety communications in the VHF band including those established by the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended;

e) that ITU-R is conducting studies on improving efficiency in the use of this band, and that these studies are still ongoing;

f) that changes made in Appendix **S18** should not prejudice the future use of these frequencies or the capabilities of systems or new applications required for use by the maritime mobile service;

g) that the congestion on Appendix **S18** frequencies calls for the implementation of efficient new technologies;

h) that the use of new technology on maritime VHF frequencies will make it possible to better respond to the emerging demand for new services,

noting

that some administrations are considering adopting some of the above changes to their operations within the Appendix **S18** frequencies,

resolves

that the 1999 World Radiocommunication Conference (WRC-99) should consider the use of new technology in the band 156-174 MHz and consequential revision of Appendix **S18**,

invites ITU-R

to continue studies on the following with a view to providing a report to WRC-99:

a) to identify the future requirements of the maritime mobile service;

b) to identify suitable technical characteristics of the system or interoperable systems to replace existing technology;

c) to identify necessary modifications to the frequency plan contained within Appendix **S18**;

d) to recommend a timetable for the introduction of new technology and the necessary changes;

e) to study and recommend how new technology can be introduced without harming the distress and safety requirements,

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization.

RESOLUTION 343 (WRC-97)

Maritime certification for personnel of ship stations and ship earth stations for which a radio installation is not compulsory

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that this Conference has considered the question of certification for personnel of ship stations and ship earth stations within the Global Maritime Distress and Safety System (GMDSS);

b) that GMDSS will be fully implemented on 1 February 1999 by ships subject to an international agreement;

c) that ships not subject to an international agreement have begun to adopt GMDSS systems and techniques;

d) that use of GMDSS equipment should be accompanied by appropriate training and certification;

e) that the Radio Regulations stipulate that the service of every ship radio station working on frequencies assigned for international use shall be performed by operators holding a certificate;

f) that the present certificates described in Article **S47** of the Radio Regulations may be too demanding for radio operators of ship stations and ship earth stations on board ships for which a radio installation is not compulsory,

noting

that a number of administrations currently issue radio operator certificates specially designed for the non-compulsory sector,

resolves

that administrations wishing to implement special certification for the non-compulsory sector should implement the certificates contained in the Annex to this Resolution,

invites ITU-R

to develop a Recommendation describing these certificates,

instructs the Secretary-General

to bring this Resolution to the attention of the International Maritime Organization.

ANNEX TO RESOLUTION 343 (WRC-97)

Examination syllabus for radio operator's certificates appropriate to vessels using the frequencies and techniques of the Global Maritime Distress and Safety System on a non-compulsory basis

Introduction

The introduction of the Global Maritime Distress and Safety System (GMDSS) in February 1992 made it necessary to harmonize the examination requirements for certificates for professional radio operators. Harmonized examination procedures for the General Operator's Certificate and Restricted Operator's Certificate, based on the syllabuses described in Article **S47** of the Radio Regulations, have already been introduced for maritime radio operators performing radiocommunication duties on board vessels subject to the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended. The GMDSS will be fully implemented on 1 February 1999 for vessels subject to SOLAS.

For vessels not subject to SOLAS, and which install radiocommunication equipment on a voluntary basis, there are significant advantages to also using the GMDSS. However, it was foreseen by some administrations that such vessels would use some, but not all, of the frequencies and techniques of the GMDSS and that radio personnel on board such vessels would not need the same level of certification as radio personnel on board vessels which use all of the frequencies and techniques of the GMDSS on a compulsory basis. A syllabus has been developed which provides the flexibility for a depth of study, level of knowledge, and length of course appropriate to meet the certification requirements of radio personnel on board vessels which use some of the frequencies and techniques of the GMDSS on a non-compulsory basis. The syllabus also provides for certification in the use of satellite equipment where appropriate.

This Annex describes the syllabus developed to meet the certification requirements referred to above, and which are implemented in a number of countries under the title “Long Range Certificate” and “Short Range Certificate”. The Short Range Certificate should at least contain those elements of the syllabus which are relevant to sea area A1.

Examination syllabus

The examination should consist of theoretical and practical tests and should include at least:

A. *General knowledge of radiocommunications in the maritime mobile service*

A.1 The general principles and basic features of the maritime mobile service.

B. *Detailed practical knowledge and ability to use radio equipment*

B.1 The VHF radio installation. Use of VHF equipment in practice.

B.2 The MF/HF radio installation. Use of MF/HF equipment in practice.

B.3 Purpose and use of digital selective calling (DSC) facilities and techniques.

C. *Operational procedures of the GMDSS and detailed practical operation of GMDSS subsystems and equipment*

C.1 Basic introduction to GMDSS procedures.

C.2 Distress, urgency and safety communication procedures in the GMDSS.

C.3 Distress, urgency and safety communication procedures by radiotelephony in the old distress and safety system.

C.4 Protection of distress frequencies.

C.5 Maritime Safety Information (MSI) systems in the GMDSS.

C.6 Alerting and Locating Signals in the GMDSS.

D. *Operational procedures and regulations for radiotelephone communications*

D.1 Ability to exchange communications relevant to the safety of life at sea.

D.2 Regulations, obligatory procedures and practices.

D.3 Practical and theoretical knowledge of radiotelephone procedures.

D.4 Use of the international phonetic alphabet and, where appropriate, parts of the IMO Standard Marine Communication Phrases.

E. *Optional examination module for the maritime mobile-satellite service for vessels not subject to a compulsory fit*

E.1 The general principles and basic features of the maritime mobile-satellite service.

E.2 Operational procedures and detailed practical operation of ship earth stations in the GMDSS.

RESOLUTION 344 (WRC-97)

Exhaustion of the maritime mobile service identity numbering resource

The World Radiocommunication Conference (Geneva, 1997),

noting

a) that ships not required to carry Global Maritime Distress and Safety System (GMDSS) equipment may do so, for safety purposes;

b) that digital selective calling equipment on such ships for VHF radio, and/or Inmarsat ship earth station equipment requires the assignment of a unique maritime mobile service identity (MMSI);

c) that not all administrations assign these identities to users of digital selective calling-equipped VHF radios on such ships, from the numbers intended for use by vessels sailing and communicating only with domestic coast stations,

considering

a) that VHF digital selective calling distress alerts require valid identities for use by search and rescue authorities;

b) that Recommendation ITU-R M.585 contains guidance for the assignment of MMSIs, including to non-compulsory ships which communicate only with domestic radio stations; and

c) that Recommendation ITU-R M.585 was derived from ITU-T Recommendation E.210,

recognizing

a) that even domestic ships which install Inmarsat will require the assignment of MMSI numbers from those numbers reserved for ships communicating worldwide, further depleting the resource;

b) that future growth of Inmarsat B, C and M mobile earth station use by non-compulsory ships is not, however, expected to deplete the resource;

c) that growth projections of Inmarsat systems by non-compulsory ships could nevertheless change,

noting further

that ITU-R can monitor the status of the MMSI resource by monitoring the available spare maritime identification digits (first three digits of the MMSI),

instructs the Director of the Radiocommunication Bureau

to monitor the status of the MMSI resource, and to report to each world radiocommunication conference on the anticipated reserve capacity and expected exhaustion of the resource,

resolves to invite ITU-T and ITU-R

1. to keep under review the Recommendations for assigning MMSIs, with a view to identifying alternative resources before the resources are exhausted;

2. to consult each other when addressing changes to any of the Recommendations affecting the MMSI numbering resources;

3. to complete studies on an urgent basis when a future world radiocommunication conference identifies the impending exhaustion of the MMSI resource,

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization.

RESOLUTION 345 (WRC-97)

Operation of Global Maritime Distress and Safety System equipment on and assignment of maritime mobile service identities to non-compulsory fitted vessels

The World Radiocommunication Conference (Geneva, 1997),

noting

a) that ships not required by international agreement to carry Global Maritime Distress and Safety System (GMDSS) equipment could elect to do so for safety purposes;

b) that such vessels may only carry VHF digital selective calling (DSC) equipment;

c) that some administrations may not require operators on such vessels to have appropriate training, certification or licence;

d) that not all administrations assign and register identities to users of VHF DSC equipment on such ships,

considering

that VHF DSC false distress alerts are a problem for rescue coordination centres, particularly when incorrect identities are used, or when the radio is operated by persons untrained in its use,

recognizing

that administrations have different training requirements for users of VHF DSC equipment,

resolves

1. to invite ITU-R to consider DSC standards and operating procedures in order to simplify operation of this equipment;

2. to invite ITU-T and ITU-R to review the process for assigning maritime mobile service identities for simplifying the process, taking into account cases of new installation, sale of the vessel or transfer of the equipment to a new ship;

3. to invite ITU-T and ITU-R to undertake studies to ensure the registration and continuous accessibility and availability of identities to rescue authorities,

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization for consideration and comments.

RESOLUTION 346 (WRC-97)

Protection of distress and safety communications on the frequencies 12 290 kHz and 16 420 kHz from harmful interference caused by these frequencies if also used for non-safety calling

The World Radiocommunication Conference (Geneva, 1997),

noting

a) that the frequencies 4 125 kHz, 6 215 kHz, 12 290 kHz and 16 420 kHz are used for distress and safety communications as well as for non-safety calling by ships in radiotelephony in accordance with the provisions of Article **S31** and No. **S52.221** of the Radio Regulations respectively;

b) that considerable worldwide interference to distress and safety communications is experienced, especially on the frequencies 12 290 kHz and 16 420 kHz, due to ships being unable to monitor these frequencies before calling,

noting further

a) that the recommended agenda for the 2001 World Radiocommunication Conference (WRC-01) includes an agenda item 2.4 for review of the channel arrangements in the HF bands for the maritime mobile service, taking into account the use of new digital technology;

b) that consideration of this item by WRC-01 may result in assigning the frequencies 12 290 kHz and 16 420 kHz exclusively for distress and safety communications,

recognizing

that it is of vital importance for the safety of life at sea that distress and safety communications can be carried out without being hampered by harmful interference,

resolves

1. to urge administrations:

1.1 to move, where appropriate, their coast station calling frequencies from the channels 1221 and 1621 to any other suitable HF channel;

1.2 to request ships under their jurisdiction to refrain from using the frequencies 12 290 kHz and 16 420 kHz for non-safety calling;

2. to recommend that WRC-01 consider this subject,

instructs the Secretary-General

to bring this Resolution to the attention of the International Maritime Organization.

RESOLUTION 347 (WRC-97)

Use of digital telecommunication technologies in the MF and HF bands by the maritime mobile service

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that amendments to Article **S52** of the Radio Regulations have been adopted by this Conference to provide for the use of digital telecommunication technology in the maritime HF telephony and A1A Morse bands;

b) that there may be a need for consequential changes in Appendix **S17** to the Radio Regulations to reflect provisions made at this Conference for the use of digital telecommunications in the maritime HF telephony bands,

considering further

a) that it would be desirable to extend the use of digital telecommunication technology to the maritime HF A1A Morse telegraphy bands as well;

b) that these bands are significantly underutilized at present;

c) that the requirement for use of new digital technologies in the maritime mobile service is growing rapidly,

noting

a) that Resolution **720 (WRC-95)** of the 1995 World Radiocommunication Conference sets forth a preliminary agenda for the 1999 World Radiocommunication Conference that includes item 2.4 “Review of the channel arrangements in HF bands for the maritime mobile service, taking into account the use of new digital technology”;

b) that use of the maritime HF A1A Morse radiotelegraphy bands is steadily diminishing with the result that administrations are already beginning to use these bands for digital telecommunication systems on a non-interference basis,

resolves

to recommend that the 2001 World Radiocommunication Conference make changes to Appendix **S17** and Article **S52,** as needed,

instructs the Secretary-General

to bring this Resolution to the attention of the International Maritime Organization.

RESOLUTION 348 (WRC-97)

Studies required to provide priority to distress communications originated by shore-based search and rescue authorities

The World Radiocommunication Conference (Geneva, 1997),

noting

a) that Article **S53** of the Radio Regulations provides priority for distress and safety communications which involves immediate access to the space segment;

b) that distress and safety communications from shore-based search and rescue authorities will also be given priority access to the space segment;

c) that when ships are communicating using their ship earth stations, these priority requests are not able to be completed without manual intervention using a manual procedure to clear all traffic to and from the ship,

considering

a) that persons on board ships in distress or involved with a distress case may wish to use the ship earth station to notify friends, family and business associates on shore;

b) that this could cause priority requests from rescue authorities to receive a busy signal;

c) that unacceptable delays may be encountered in clearing all traffic to and from the ships manually,

recognizing

a) that life and property may be lost if rapid access is not provided for distress related communications originated by the rescue authority;

b) that the International Maritime Organization (IMO) has considered this problem and decided that provisions are necessary for giving priority to shore-originated distress communications;

c) that Inmarsat is currently studying how to provide such priority communications,

resolves to invite

1. ITU-R to monitor the status of these studies and to develop suitable Recommendations;

2. IMO to develop requirements for priority communications for distress-related communications originated by shore-based search and rescue authorities and to submit these requirements to the next competent world radiocommunication conference,

further invites the Council

to place this Resolution on the agenda of a future competent world radiocommunication conference,

instructs the Secretary-General

to communicate this Resolution to IMO and the International Civil Aviation Organization for appropriate action and comment.

RESOLUTION 349 (WRC-97)

Operational procedures for cancelling false distress alerts in the Global Maritime Distress and Safety System

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the 1974 International Convention for the Safety of Life at Sea (SOLAS), as amended, prescribes that ships subject to that Convention shall be fitted with Global Maritime Distress and Safety System (GMDSS) equipment as appropriate;

b) that non-SOLAS vessels are also being equipped with GMDSS equipment;

c) that the transmission and relay of false distress alerts is a significant problem within the GMDSS,

noting

that the International Maritime Organization (IMO) has developed similar operational procedures to cancel false distress alerts,

resolves

1. to urge administrations to take all necessary measures to avoid false distress alerts and to minimize the unnecessary burden on rescue organizations which occurs;

2. to urge administrations to encourage the correct use of GMDSS equipment, with particular attention to appropriate training;

3. to urge administrations to implement the operational procedures contained in the Annex to this Resolution;

4. that administrations should take any consequential appropriate action in this respect,

instructs the Secretary-General

to bring this Resolution to the attention of IMO.

ANNEX TO RESOLUTION 349 (WRC-97)

Cancelling of false distress alerts

If a distress alert is inadvertently transmitted, the following steps shall be taken to cancel the distress alert.

1. VHF Digital Selective Calling

1) Reset the equipment immediately;

2) Set to channel 16; and

3) Transmit a broadcast message to "All Stations" giving the ship's name, call sign and maritime mobile service identity (MMSI), and cancel the false distress alert.

2. MF Digital Selective Calling

1) Reset the equipment immediately;

2) Tune for radiotelephony transmission on 2 182 kHz; and

3) Transmit a broadcast message to "All Stations" giving the ship's name, call sign and MMSI, and cancel the false alert.

3. HF Digital Selective Calling

1) Reset the equipment immediately;

2) Tune for radiotelephony on the distress and safety frequency in each band in which a false distress alert was transmitted (see Appendix **S15** to the Radio Regulations); and

3) Transmit a broadcast message to "All Stations" giving the ship's name, call sign and MMSI, and cancel the false alert on the distress and safety frequency in each band in which the false distress alert was transmitted.

4. Inmarsat Ship Earth Station

Notify the appropriate rescue coordination centre that the alert is cancelled by sending a distress priority message by way of the same coast earth station through which the false distress alert was sent. Provide ship name, call sign and Inmarsat identity with the cancelled alert message.

5. *Emergency Position Indicating Radiobeacon (EPIRB)*

If for any reason an EPIRB is activated inadvertently, contact the appropriate rescue coordination centre through a coast station or land earth station and cancel the distress alert.

6. General

Notwithstanding the above, ships may use additional appropriate means available to them to inform the appropriate authorities that a false distress alert has been transmitted and should be cancelled.

RESOLUTION 506 (Rev.WRC-97)

Use by space stations in the broadcasting-satellite service operating in the 12 GHz frequency bands allocated to the broadcasting-satellite service of the geostationary-satellite orbit and no other

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that a Plan designating frequency assignments in the above-mentioned frequency bands and positions in the geostationary-satellite orbit was adopted by the World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977) for Regions 1 and 3;

b) that a similar Plan for Region 2 was adopted by the Regional Administrative Conference for the Planning of the Broadcasting-Satellite Service in Region 2 (Geneva, 1983);

c) that the Plans referred to in *considering a)* and *b)* above were consolidated in Appendix **30 (Orb-85)** to the Radio Regulations at the First Session of the World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Geneva, 1985);

d) that the Plans in Appendices **S30** and **S30A** to the Radio Regulations for Regions 1 and 3 have been modified by this Conference,

e) that the operation of the broadcasting-satellite service in the frequency bands concerned in orbits other than the geostationary-satellite orbit might be incompatible with the Plans referred to in *considering a), b)* and *d)* above,

resolves

that administrations shall ensure that their space stations in the broadcasting-satellite service in these frequency bands are operated in the geostationary-satellite orbit and no other.

RESOLUTION 517 (Rev.WRC-97)

Transition from double-sideband to single-sideband or other spectrum-efficient modulation techniques in the high-frequency bands between 5 900 kHz and 26 100 kHz allocated to the broadcasting service

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the high-frequency (HF) bands allocated to the broadcasting service between 5 900 kHz and 26 100 kHz are severely congested;

b) that single-sideband (SSB) techniques allow more efficient utilization of the frequency spectrum than double-sideband (DSB) techniques;

c) that SSB techniques enable reception quality to be improved;

d) that Recommendation **515 (HFBC-87)** encourages the accelerated design and manufacture of SSB transmitters and receivers;

e) Appendix **S11** to the Radio Regulations concerning the SSB system specification in the HF broadcasting services;

f) that rapid developments are taking place in digital sound broadcasting technologies;

g) that digital modulation or other spectrum-efficient modulation techniques are expected to provide the means to achieve the optimum balance between sound quality, circuit reliability and bandwidth;

h) that digitally modulated emissions can, in general, provide more efficient coverage than amplitude-modulated transmissions by using fewer simultaneous frequencies and less power;

i) that the lifetime of a transmitter is at least twenty years;

j) that it is economically unattractive, using current technology, to convert existing conventional DSB broadcasting systems to SSB operation;

k) that some DSB transmitters have been used with digital modulation techniques without transmitter modifications;

l) that the lifetime of a receiver is of the order of ten years;

m) that ITU-R is carrying out urgent studies on the development of broadcasting digital modulation emissions in the bands allocated to the broadcasting service below 30 MHz;

n) that other spectrum-efficient modulation techniques may be developed in the future,

resolves

1. that the procedure in the Annex to this Resolution shall be used for the purpose of ensuring an orderly transition from DSB to SSB or other spectrum-efficient modulation techniques recommended by ITU-R in the HF bands between 5 900 kHz and 26 100 kHz allocated to the broadcasting service;

2. that the final date for the cessation of DSB emissions specified in the Annex to this Resolution shall be periodically reviewed by competent future world radiocommunication conferences in the light of the latest available complete statistics on the worldwide distribution of SSB and other spectrum-efficient modulation technique transmitters and receivers, as called for in Resolution **537 (WRC-97)**,

instructs the Director of the Radiocommunication Bureau

to compile and maintain the statistics referred to in *resolves* 2, to make these statistics available to administrations and to submit summaries thereof to competent future world radiocommunication conferences,

invites ITU-R

to continue its studies on digital techniques in HF broadcasting as a matter of urgency with a view to the development of this technology for future use,

invites administrations

to assist the Director of the Radiocommunication Bureau by providing the relevant statistical data and to participate in ITU-R studies on matters relating to the development and introduction of digitally modulated transmissions in the HF bands between 5 900 kHz and 26 100 kHz allocated to the broadcasting service.

ANNEX TO RESOLUTION 517 (Rev.WRC-97)

Procedure for the transition from double-sideband to single-sideband or other spectrum-efficient modulation techniques in the high-frequency bands between 5 900 kHz and 26 100 kHz allocated to the broadcasting service

1. The early introduction of single-sideband (SSB) or other spectrum-efficient modulation techniques recommended by ITU-R is encouraged.

2. All double-sideband (DSB) emissions shall cease not later than 31 December 2015, at 2359 hours UTC.

3. SSB emissions shall comply with the characteristics specified in Appendix **S11** to the Radio Regulations.

4. Other spectrum-efficient modulation techniques, including digital, shall comply with the characteristics to be recommended by ITU-R.

5. After 31 December 2015, 2359 hours UTC, SSB emissions shall comply with the characteristics specified in Appendix **S11** which, *inter alia*, require a carrier reduction of 12 dB relative to peak envelope power.

6. Until 31 December 2015, 2359 hours UTC, SSB emissions intended for reception by DSB receivers with envelope demodulation, in the bands currently used under Article **S12** of the Radio Regulations, shall have a carrier reduction of 6 dB relative to peak envelope power.

7. SSB emissions with a carrier reduction of 12 dB relative to peak envelope power can also be introduced in the spectrum allocated for the type of emission described in § 6 above.

8. Other spectrum-efficient modulation techniques recommended by ITU-R, including digital, can also be introduced in the HF bands between 5 900 kHz and 26 100 kHz allocated to the broadcasting service.

9. Until 31 December 2015, 2359 hours UTC, whenever an administration replaces a DSB emission by an emission using SSB or other spectrum-efficient modulation techniques, including digital, it shall ensure that the level of interference is not greater than that caused by the original DSB emission.

RESOLUTION 532 (WRC-97)

Review and possible revision of the 1997 broadcasting-satellite service Plans for Regions 1 and 3

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that it has adopted a revision of the broadcasting-satellite service (BSS) Plans for Regions 1 and 3 providing capacity for all new countries in accordance with Resolutions **524 (WARC-92)** and **531 (WRC-95)**;

b) that certain countries requested that a replanning be undertaken in order to increase the Plan capacity so as to provide a channel capacity large enough to permit the economical development of a broadcasting-satellite system;

c) the increasing number of applications under Article 4 of appendices **30/S30** and **30A/S30A** for modifications involving additions to the Plans;

d) the rights of all Member States to equitable access to the spectrum allocated to satellite broadcasting, and that Article 44 of the Constitution provides, *inter alia*, that "Members shall bear in mind that radio frequencies and the geostationary-satellite orbit are limited natural resources and that they must be used rationally, efficiently and economically, in conformity with the provisions of the Radio Regulations, so that countries or groups of countries may have equitable access to both",

resolves

1. that an inter-conference representative group (IRG) shall be established in accordance with Annex 2;

2. that the Director of the Radiocommunication Bureau shall present the results of the IRG's studies to the 1999 World Radiocommunication

Conference (WRC-99) regarding the feasibility of increasing the minimum assigned capacity for countries in Regions 1 and 3 to around ten analogue-equivalent channels, based on the planning principles in Annex 1;

3. that WRC-99 should consider the results of the above studies and, if the conclusion is that such replanning is feasible, initiate an appropriate revision for completion no later than 2001,

invites ITU-R

to study, as a matter of urgency, the technical possibilities for increasing the minimum capacity assigned to all Region 1 and 3 countries in the Plans for Regions 1 and 3 contained in Appendices **30/S30** and **30A/S30A** to the Radio Regulations, in cooperation with the IRG and in accordance with the principles set out in Annex 1,

invites the Council to recommend to the 1998 Plenipotentiary Conference

to consider convening a world radiocommunication conference no later than 2001 to revise those parts of the Plans in Appendices **S30** and **S30A** applying to Regions 1 and 3, subject to consideration by WRC-99 of the results of the studies carried out by the IRG,

instructs the Secretary-General

to bring this Resolution to the attention of the Council, with a view to undertaking, at competent conferences, a review of the studies and, if necessary, a revision of the relevant parts of Appendices **S30** and **S30A** and associated provisions of the Radio Regulations.

ANNEX 1 TO RESOLUTION 532 (WRC-97)

Principles for the review and possible revision of the 1997 broadcasting-satellite service Plans for Regions 1 and 3

The 1997 World Radiocommunication Conference (WRC-97) reviewed the planning principles proposed by several administrations and those adopted by the 1995 World Radiocommunication Conference (WRC-95) in Resolution **531 (WRC-95)**, and agreed to establish an IRG to carry out studies in accordance with the principles given below.

These principles are to be used in assessing the possibilities for meeting the objectives in this Resolution.

1. Provide, for all countries, a minimum capacity equivalent to around ten analogue channels while maintaining the same proportionality adopted by the 1977 Conference (WARC-77).

2. Planning is to be based mainly on national coverage.

3. Protect notified assignments which are in conformity with Appendices **30** and **30A**, which have been brought into use and for which the date of bringing into use has been confirmed to the Bureau.

4. In order to avoid obsolescence of the Plans, caused by technical assumptions becoming out of date, ensure that the Plans are established with a view to achieving long-term flexibility.

5. Leaving capacity for future additional requirements.

6. Consider, for planning, whether a complete digital approach may be appropriate in the future and, if so, provide for the simultaneous operation of analogue and digital systems, if necessary during a defined time-scale.

7. Ensure that the integrity of the Region 2 Plans and their associated provisions is preserved, by providing the same protection to the assignments contained in those Plans as is now received

under the relevant provisions of the Radio Regulations, and by not requiring more protection from assignments in the Region 2 Plans than that currently provided under the Radio Regulations.

8. Ensure compatibility between the BSS in Regions 1 and 3 and services having allocations in the planned bands in all three Regions.

ANNEX 2 TO RESOLUTION 532 (WRC-97)

Inter-conference representative group

WRC-97 has resolved that an IRG be established to study the feasibility of increasing the minimum capacity for countries in Regions 1 and 3 to around the equivalent of ten analogue channels in accordance with the principles set out in Annex 1.

The IRG should be structured to consist of:

– a supervisory policy group open to participation by all Member States, but endeavouring to ensure adequate representation of administrations from all ITU Regions;

– the Bureau, assisted by a group of technical experts (GTE) and working under the guidance of the supervisory policy group. Members of the GTE should be drawn from all Member States and Sector Members on the basis of technical expertise.

Joint Working Party 10-11S is encouraged to contribute to the studies requested of ITU-R, as appropriate.

Requests for additional studies by the IRG

1. *Annex 7 of Appendix **30/S30** to the Radio Regulations*

The IRG is requested to examine Annex 7 in the light of its studies for possible revision of the BSS Plans and with respect to the decisions taken by WRC-97, such as the reduction of downlink e.i.r.p. Its advice on the relevance of that Annex in providing protection to all services sharing the Plan bands, and particularly the Region 2 BSS Plans, should be reported to WRC-99.

2. *Avoidance of monopolization of the BSS resource*

The IRG is requested to consider concerns identified by WRC-97: modifications of the Plans for additional requirements or subregional systems should not lead to monopolization of the use of the bands by a country or a group of countries. Advice on how to address these concerns should be reported to WRC-99.

Requests for studies by ITU-R

ITU-R is requested to study and provide advice to the IRG on the following subjects.

1. Appropriate technical criteria for the studies addressing the following:

– digital-to-digital protection ratios;

– digital-to-analogue protection ratios;

– analogue-to-digital protection ratios;

– digital emission masks;

and associated calculation methods.

2. A possible reduction in e.i.r.p. and related *C/N* ratio and link budget margins, as a means of alleviating BSS/terrestrial compatibility constraints.

3. Appropriate feeder-link e.i.r.p. and receiver noise temperature.

4. Comparison of alternative polarization options.

5. The suitability of the minimum earth receive elevation angles used by WARC-77.

Request to ITU

ITU is requested to provide the necessary assistance to facilitate the active participation of developing countries, especially the least developed countries, in both the supervisory policy group and the GTE of the IRG.

RESOLUTION 533 (WRC-97)

Implementation of the decisions of the World Radiocommunication Conference (Geneva, 1997) relating to Appendices S30 and S30A to the Radio Regulations

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that this Conference has adopted values for various technical parameters relating to Appendices **S30** and **S30A** to the Radio Regulations;

b) that these technical parameters were used for the establishment of the revised Plans for Regions 1 and 3,

recognizing

a) that the revised Regions 1 and 3 Plans must be compatible with the Region 2 Plans and with the other services which have primary allocations in the planned bands in all three Regions;

b) that, in revising the Regions 1 and 3 Plans, the orbital position of a number of administrations were changed;

c) that a large number of Appendices **S30** and **S30A** Article 4 submissions that have either been processed or are currently being processed might affect the services mentioned in *recognizing a)* above;

d) that the Radiocommunication Bureau needs clear instructions from this Conference on how to deal with these submissions and how to protect the Region 2 Plans and other services;

e) that the instructions to the Radiocommunication Bureau should take effect as of the close of this Conference (22 November 1997),

resolves

1. that as of 22 November 1997 the Radiocommunication Bureau shall use the values of technical parameters adopted for planning at this Conference in its subsequent examination of submissions for modification and notifications of assignments in the Regions 1 and 3 Plan received under Articles 4 and 5 of Appendices **S30** and **S30A**. In particular, the following technical parameters shall be applied:

– protection ratios used for the equivalent protection margin (EPM) analyses as defined in Recommendation ITU-R BO.1297 instead of the protection ratios applied at the 1977 Conference (WARC-77) and the 1988 Conference (WARC Orb-88);

– new reference earth receiving antenna pattern (Recommendation ITU-R BO.1213) instead of earth reference receiving antenna pattern applied at WARC-77;

– new reference feeder-link antenna patterns (Earth and space stations) in accordance with Recommendations ITU-R BO.1295 and ITU-R BO.1296 instead of the feeder-link (Earth and space stations) reference antenna patterns applied at WARC Orb-88;

2. that the following revisions to the Regions 1 and 3 Plans:

– the replacement of the assignments to Australia at 128° E and 98° E by assignments at 152° E and 164° E, respectively;

– the assignments successfully coordinated under Article 4 of Appendices **30** and **30A** for satellite networks RST-1, -2, -3 and -5, at orbital positions 36° E, 56° E, 86° E and 140° E, respectively;

– the replacement of assignments at 31° W by assignments at 30° W and 33.5° W* ;

shall not be considered as new or additional assignments under § 4.1*b)* of Article 4 of Appendices **S30** and **S30A**. Therefore, these assignments shall not be subject to the provisions of § 4.3.5 of Appendix **S30** and § 4.2.5 of Appendix **S30A** and the associated Rules of Procedure. In particular, the associated orbital positions shall be treated as "orbital positions in the Plan", and the assignments shall not lapse even if they are not brought into use within eight years from the adoption of the revised Plans;

3. that the Radiocommunication Bureau shall use EPM criteria to establish a new reference situation for the revised Regions 1 and 3 broadcasting-satellite service and feeder-link Plans. In creating the new reference situation, the Radiocommunication Bureau shall convert the merged overall EPM file into separate uplink and downlink EPM files by eliminating the redundant beams created for the purpose of overall EPM calculations using different "strapping" between feeder-link and downlink channels. The resultant new reference situation, including the use of power control for the feeder link, shall be published in a circular-letter for subsequent use in the application of the provisions of Appendices **S30** and **S30A**;

4. that the Radiocommunication Bureau shall review all special sections already published in order to determine the requirement for coordination with the revised Regions 1 and 3 Plans as well as with the current Region 2 Plans and other services in all three Regions, and publish the results of its review in corrigenda to the concerned special sections (see Resolution **53 (WRC-97)**);

* The orbital position at 31° W shall no longer be considered as an orbital position in the Plan.

5. that in examining the requirement for coordination of other services in all three Regions with the revised Regions 1 and 3 Plans in the cases described in *resolves* 4., the following methodology shall be applied:

– Protection from fixed-satellite service assignments already published. The Radiocommunication Bureau shall review all relevant special sections of the series, e.g. AP30/C previously published, and publish corrigenda where required.

– Protection from fixed-satellite service assignments not yet processed. The Radiocommunication Bureau shall determine the requirement for coordination and publish the request in its weekly circular. The administrations responsible for the fixed-satellite service assignments shall then initiate coordination with the affected assignments in the revised Plans.

– Protection from terrestrial assignments already in process. The Radiocommunication Bureau shall determine the requirement for coordination and publish the request in its weekly circular. The administration responsible for the terrestrial assignments shall then initiate coordination with the affected assignments in the revised Plans;

6. that as of the end of the Conference the Radiocommunication Bureau shall process the pending Article 4 modifications with respect to the revised reference situation described in *resolves* 3., as follows:

– the Radiocommunication Bureau shall process all pending modifications to the Plans of Appendix **S30** and Appendix **S30A** (i.e. those modifications being treated under Article 4 that have not yet completed the modification procedures) in the same date order of receipt by the Radiocommunication Bureau of the complete information on the request for modification and, using the new technical planning criteria and reference situation, identify for each pending modification the list of administrations whose agreement is required and publish this list of affected administrations;

– within four months from the date of the above publication, possibly affected administrations should provide comments to the Radiocommunication Bureau and to the notifying administration; however, the notifying administration shall indicate any agreements which have been obtained previously and any new agreements;

– in those cases where the degradation of the equivalent protection margins caused by the proposed modification is no worse under the new situation arising from the revision of the Plans than under the original situation, any agreements previously obtained under the Article 4 procedures of Appendices **30** or **30A** should be confirmed by the respective administrations;

– the existing time period to bring the modifications or additions into use of five years plus a possible extension of three years will continue to be counted as from the date of receipt of the modification or additions by the Radiocommunication Bureau of the complete Annex 2 information pertaining to the request for modification;

– any modifications or additions involving new frequencies or orbit positions, or both, which have not been brought into service within this five + three-year period shall be cancelled by the Radiocommunication Bureau after it has informed the notifying administrations.

RESOLUTION 534 (WRC-97)

Implementation of Annex 5 to Appendix S30 and Annex 3 to Appendix S30A

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that this Conference has modified the Plan for the broadcasting-satellite service (BSS) in the frequency bands 11.7-12.2 GHz in Region 3 and 11.7-12.5 GHz in Region 1, as well as the Plan for feeder links for the BSS in the frequency bands 14.5-14.8 GHz and 17.3-18.1 GHz in Regions 1 and 3, using the updated technical criteria as contained in Annex 5 to Appendix **S30** and Annex 3 to Appendix **S30A** to the Radio Regulations;

b) that this Conference decided that the provisions of the Radio Regulations, as revised by it, shall provisionally apply as from 1 January 1999;

c) that there is a need to apply the same technical criteria for processing new Article 4 submissions, so as to avoid problems of a parallel set of technical criteria,

resolves to instruct the Radiocommunication Bureau

to apply, as of 22 November 1997, the technical data contained in Annex 5 to Appendix **S30** and Annex 3 to Appendix **S30A** to the submissions under Articles 4 and 5 of those Appendices.

RESOLUTION 535 (WRC-97)

Information needed for the application of Article S12 of the Radio Regulations

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that this Conference adopted Article **S12** of the Radio Regulations as a simple and flexible seasonal planning procedure for high-frequency (HF) broadcasting based on coordination;

b) that Article **S12** responds to the intent of Resolution **508** and Resolution **523 (WARC-92)**;

c) that Article **S12** makes reference to the Rules of Procedure,

considering further

that appropriate Rules of Procedure are to be developed by the Radiocommunication Bureau and adopted by the Radio Regulations Board,

instructs the Director of the Radiocommunication Bureau

to consider the information contained in the Annex to this Resolution in developing the Rules of Procedure,

urges administrations

1. to support the Director of the Radiocommunication Bureau in the preparation of these Rules of Procedure and in the development and testing of any accompanying computer software;

2. to submit their schedules in a common electronic format to be defined in the Rules of Procedure,

requests the Secretary-General

to consider provision of the necessary funding to enable developing countries to participate fully in the application of Article **S12** and relevant radiocommunications seminars.

ANNEX TO RESOLUTION 535 (WRC-97)

This Annex responds to the need for information in the application of Article **S12** of the Radio Regulations; the flowchart in Description 2 provides an overview of the Procedure.

1. *Software development*

The Procedure will require a number of user-friendly software modules to be developed, tested and supplied to administrations by the Radiocommunication Bureau. This will ensure that the same software modules are used by administrations and the Bureau for the analysis of the schedules.

The Bureau should:

– develop the aforementioned software with assistance from administrations;

– distribute the software, together with user instructions and relevant documentation;

– organize training in the use of the software;

– monitor the functional performance of the software and, if necessary, make necessary modifications.

2. *Software modules*

Data capture of requirements

A new module will be required that permits the capture of all data elements detailed in Description 3. This module should also contain validation routines that prevent inconsistent data being captured and sent to the Bureau for processing.

Propagation calculation

This new module should calculate the field strength and other necessary data at all relevant test points as described in Descriptions 1 and 4.

It should also include an option that allows administrations to select the optimum frequency bands for their requirements.

The output format of the data and the medium should be such as to allow easy publication and distribution of the results to all administrations.

The results of these calculations should be displayable in a graphical format.

Compatibility analysis

This module should use the output of the propagation calculation to provide a technical analysis of a requirement both alone and in the presence of other requirements as in Description 4. This analysis would be used in the coordination process.

The values for the parameters given in Description 4 should be user selectable, but in the absence of other values the recommended default values should be used.

The results of this analysis should be capable of being displayed in a graphical format for a defined service area as in Description 4.

Data query

This module should enable the user to perform typical data query functions.

DESCRIPTION 1

Selection of suitable frequency band(s)

General

In order to assist broadcasters and administrations in the preparation of their HF broadcasting requirements, the Bureau will prepare and distribute suitable computer software. This should be easy to use and the output should be easy to understand.

User input data

The user should be able to enter:

– the name of the transmitting station (for reference purposes);

– the geographic coordinates of the transmitting station;

– the transmitter power;

– the bands which are available for use;

– hours of transmission;

– sunspot number;

– months during which a service is required;

– the available antenna types, together with the relevant directions of maximum radiation;

– the required coverage area specified as a set of CIRAF zones and quadrants (or by means of relevant geographic information).

It is desirable that the software should be able to store the above information, once it has been entered correctly, and provide the user with an easy means of recalling any previously entered information.

Methodology and data

The software should use:

– Recommendation ITU-R BS.705 for the calculation of antenna patterns;

– Recommendation ITU-R P.533 for the prediction of wanted field-strength values;

– Recommendation ITU-R P.842 for the calculation of reliability values.

The set of 911 test points (agreed at the 1987 Conference (WARC HFBC-87)) should be used, supplemented where necessary with test points based on a geographic grid.

The software should calculate the field strength values and the fading margins at each test point inside the required service area for each of the frequency bands declared to be available, taking account of the relevant transmitting antenna characteristics for each frequency band. The desired RF signal-to-noise ratio should be user selectable with a default value of 34 dB.

The dates for which calculations are made should be user selectable, the default values being:

– 0.5 month after the start of the season;

– mid-point of the season;

– 0.5 month before the end of the season.

The times for which calculations are made should be user selectable, the default values being:

– 30 minutes past the hour in which the requirement starts;

– 30 minutes past each successive hour until the hour in which the requirement stops.

Software output data

For rapid assessment of suitable bands, the software should calculate:

– the basic service reliability for each available band and for the relevant test points from the set of 911 test points;

– the basic area reliability for each available band and for the relevant test points from the set of 911 test points.

In order to provide information about the geographic distribution of wanted signal values within the required service area, additional results should be available from the software:

– a listing should be available giving, for each of the available bands, the basic circuit reliability (BCR) for each of the test points (from the set of 911 test points) inside the required service area.

In some cases, a graphical display of the BCR values throughout the required service area may be desirable. These values should be calculated at test points at 2º intervals of latitude and longitude throughout the required service area.

The BCR values should be displayed graphically as a set of coloured or hatched “pixels” scaled in steps of 10%. It should be noted that:

– reliability values relate to the use of a single frequency band;

– reliability values are a function of the desired RF signal-to-noise ratio (user selectable);

– the field-strength values should be calculated by the supplied software on the user’s own computer hardware. The software supplied should calculate the relevant reliability values based on these field-strength values and the user-supplied desired RF signal-to-noise values.

DESCRIPTION 2

Time sequence for the Procedure

In the sequence outlined below, the start date for a given schedule period is defined as D and the end date for the same schedule period is defined as E.

Date	Action
D – 4 months	Closing date for administrations to send their schedules[1] to the Radiocommunication Bureau (Bureau), preferably by electronic mail or on 3.5" diskette (720 kbytes or 1.44 Mbytes). Schedule data will be made available via TIES as soon as it has been processed.
D – 2 months	Bureau to send to administrations a consolidated schedule (the Tentative Schedule) together with a complete compatibility analysis[2].
D – 2 weeks	Closing date for receipt of amendments from administrations to correct errors and other changes resulting from the coordination process to ensure that this information appears in the Schedule for date D.
D	Bureau to issue the High Frequency Broadcasting Schedule and compatibility analysis.
D to E	Administrations to correct errors and coordinate in-season changes of requirements, sending information to the Bureau as it becomes available.
	Bureau to issue updates of the Schedule and compatibility analysis at intervals of two months.

[1] See Description 3.

[2] See Description 4. The schedules and the results of the analyses should be available on CD-ROM and in TIES.

Date	Action
E	Closing date for receipt of final operational schedules from administrations to Bureau. No input is needed if there have been no changes to the information previously sent.
E + 1 month	Bureau to send to administrations the final consolidated schedule (the Final Schedule) together with a compatibility analysis.

Figure 1 shows, in flow chart form, the time sequence for the Procedure.

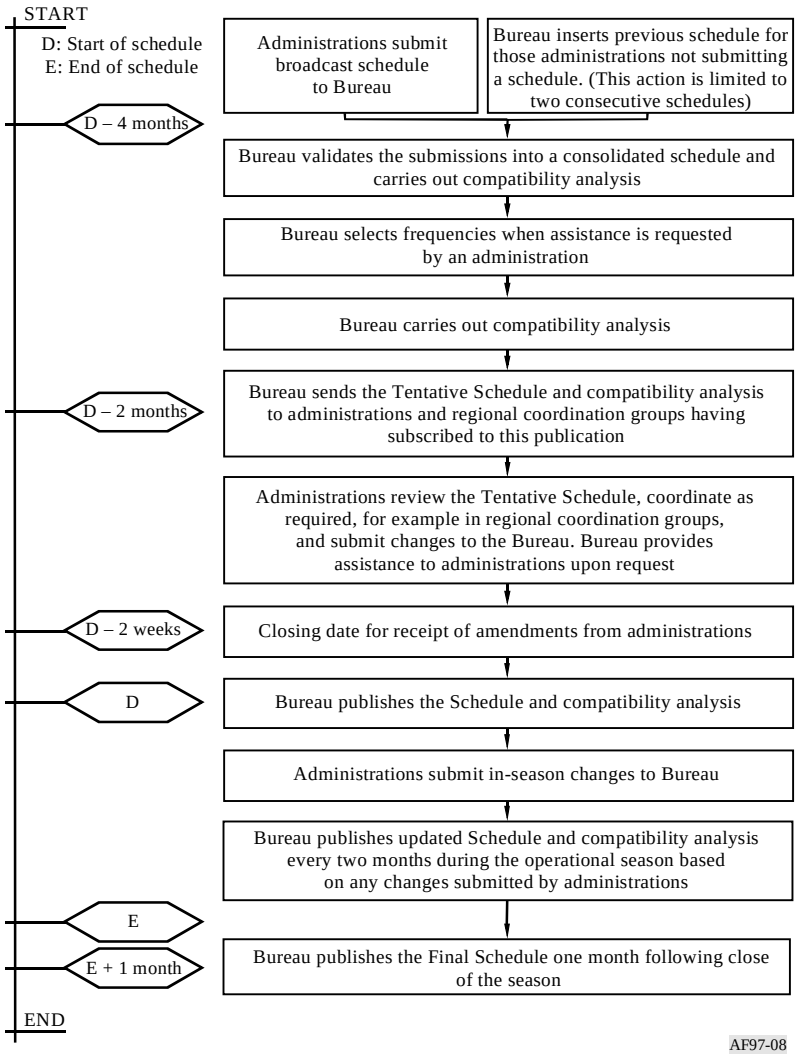


FIGURE 1

Time sequence for the Procedure

DESCRIPTION 3

Specification of input data for a requirement

The fields needed for a given requirement and their specifications are:

– frequency in kHz, up to 5-digit integer;

– start time, as 4-digit integer;

– stop time, as 4-digit integer;

– target service area, as a set of up to 12 CIRAF zones and quadrants up to a maximum of 30 characters;

– site code, a 3-character code from a list of codes, or a site name and its geographic coordinates;

– power in kW, up to 4-digit integer;

– azimuth of maximum radiation;

– slew angle, up to 2-digit integer representing the difference between the azimuth of maximum radiation and the direction of unslewed radiation;

– antenna code, up to 3-digit integer from a list of values, or a full antenna description, as given in Recommendation ITU-R BS.705;

– days of operation;

– start date, in the case that the requirement starts after the start of the schedule;

– stop date, in the case that the requirement stops before the end of the schedule;

– modulation choice, to specify if the requirement is to use DSB or SSB (see Recommendation ITU-R BS.640). This field may be used to identify any other type of modulation when this has been defined for use by HFBC in an ITU-R Recommendation;

– administration code;
– broadcasting organization code;
– identification number;
– identification of synchronization with other requirements.

DESCRIPTION 4

Compatibility analysis

General

In order to assess the performance of each requirement in the presence of noise and of the potential interference from other requirements using the same or adjacent channels, it is necessary to calculate the relevant reliability values. To this end, the Bureau will prepare suitable software, taking account of user requirements in terms of desired signal-to-noise and signal-to-interference ratios.

Input data

The schedule for a given season - this may be either an initial consolidated schedule (to permit assessment of those requirements which need coordination) or the High Frequency Broadcasting Schedule (to permit assessment of the likely performance of requirements during the relevant season).

Methodology and data

The software should use:

– Recommendation ITU-R BS.705 for the calculation of antenna patterns;
– Recommendation ITU-R P.533 for the prediction of the wanted field-strength values at each test point for each wanted requirement;

– Recommendation ITU-R P.533 for the prediction of the potentially interfering field-strength values from all other co-channel or adjacent channel requirements at each test point for each wanted requirement;

– Recommendations **517 (HFBC-87)** and ITU-R BS.560 for adjacent channel RF protection ratios;

– Recommendation ITU-R P.842 for the calculation of reliability values.

The set of 911 test points (agreed at WARC HFBC-87) should be used, supplemented where necessary with test points based on a geographic grid.

The software should calculate the wanted and unwanted field-strength values and the fading margins at each test point inside the required service area.

The desired RF signal-to-noise and RF protection ratios should be user selectable, the default values being 34 dB and 17 dB (co-channel case), respectively. The latter values should be used by the Bureau for its compatibility analyses.

The dates for which a compatibility analysis is made should be user selectable, the default values being:

– 0.5 month after the start of the season;

– mid-point of the season;

– 0.5 month before the end of the season.

These default values should be used by the Bureau for its compatibility analyses.

The times for which a compatibility analysis is made should be user selectable, the default values being:

– 30 minutes past the hour in which the requirement starts;

– 30 minutes past each successive hour until the hour in which the requirement ends.

These default values should be used by the Bureau for its compatibility analyses.

Software output data

For rapid assessment of the performance of a requirement, the software should calculate:

– the overall service reliability for the relevant test points from the set of 911 test points;

– the overall area reliability for the relevant test points from the set of 911 test points.

In order to provide information about the geographic distribution of wanted and unwanted signal values for a given requirement, additional results should be available from the software:

– a listing should be available giving the overall circuit reliability for each of the relevant test points from the set of 911 test points.

In some cases, a graphical display of the coverage achieved throughout a required service area may be desirable. These values will need to be calculated by the user (with the supplied software and on the user's own computer hardware) at test points at 2º intervals of latitude and longitude throughout the required service area. The values should be displayed graphically as a set of coloured or hatched pixels in steps of 10 per cent. It should be noted that:

– reliability values relate to the use of a single frequency;

– reliability values are a function of the desired RF signal-to-noise and RF protection ratios (both user selectable);

– the field-strength values for the test points (from the set of 911 test points) inside the required service area should be calculated by the Bureau. The software supplied should calculate the

relevant reliability values based on these pre-calculated field-strength values and the user-supplied desired signal-to-noise and signal-to-interference values.

– the field-strength values for the test points at 2º intervals should be calculated using the supplied software on the user's own computer hardware. The software supplied should calculate the relevant reliability values based on these field-strength values and the user-supplied desired signal-to-noise and signal-to-interference values.

RESOLUTION 536 (WRC-97)

Operation of broadcasting satellites serving other countries

The World Radiocommunication Conference (Geneva, 1997),

considering

a) the institutional nature of the ITU which is founded on an agreement between its Member States;

b) the treaty status of the Plans in Appendices **S30** and **S30A** to the Radio Regulations;

c) that these Plans were established on the basis of planning principles which included, *inter alia*, that the Plans should be based mainly on national coverage;

d) the increasing number of applications under Article 4 of Appendices **S30** and **S30A** for modifications to the Plans, leading to many multinational systems;

e) that No. **2674/S23.13** of the Radio Regulations requires that "in devising the characteristics of a space station in the broadcasting-satellite service, all technical means available shall be used to reduce, to the maximum, the radiation over the territory of other countries unless an agreement has been previously reached with such countries",

recognizing

a) that current technology provides opportunities to implement broadcasting-satellite systems with service areas that exceed national coverage;

b) that several such systems have been implemented and others are being planned;

c) that successful Appendices **S30** and **S30A** Article 4 coordination of such systems does not in any way imply licensing authorization to provide a service within the territory of a Member State,

resolves

that, in addition to observing No. **S23.13/2674**, and before providing satellite broadcasting services to other administrations, administrations originating the services should obtain the agreement of those other administrations.

RESOLUTION 537 (WRC-97)

Survey of HF broadcasting transmitter and receiver statistics as called for in Resolution 517 (Rev.WRC-97)

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that Resolution **517 (Rev.WRC-97)** provides for the replacement, by 31 December 2015, of double-sideband (DSB) emissions in the HF bands between 5 900 kHz and 26 100 kHz allocated to the broadcasting service;

b) that Resolution **517 (Rev.WRC-97)** resolves that the date in *considering a)* shall be periodically reviewed by competent future world radiocommunication conferences in the light of the latest available complete statistics on the worldwide distribution of single-sideband (SSB) and other spectrum-efficient modulation technique transmitters and receivers;

c) that ITU-R is studying Question ITU-R 217/10 "Digital Broadcasting at frequencies below 30 MHz" and Question ITU-R 224-1/3 "The Prediction of System Performance and Reliability for Digital Modulation Techniques at HF",

noting

a) that Recommendation **515 (HFBC-87)** recommended that new transmitters installed after 31 December 1990 be capable of operating in SSB mode;

b) that Recommendation **515 (HFBC-87)** invited administrations to encourage receiver manufacturers to begin producing low-cost receivers capable of receiving DSB and SSB broadcasting emissions by 31 December 1990,

recognizing

a) that there is insufficient information on the availability and use of HF broadcasting SSB transmitters and receivers;

b) that broadcasters, unlike most users of other radiocommunication services, have no control over the receivers used by their listeners;

c) that activity is continuing on the development of digital modulation systems for recommendation by ITU-R,

resolves

that the first survey of transmitter and receiver statistics called for in Resolution **517 (Rev.WRC-97)** should be conducted as a matter of urgency, such that its results will be available to the 2001 World Radiocommunication Conference for consideration.

RESOLUTION 538 (WRC-97)

Use of the frequency bands covered by Appendices 30/S30 and 30A/S30A by non-geostationary-satellite systems in the fixed-satellite service

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that provisional limits have been established and included in Article **S22** of the Radio Regulations and in the Annex to this Resolution to ensure that the interference caused by non-geostationary-satellite (non-GSO) systems in the fixed-satellite service (FSS) into assignments operated in conformity with the Appendices **30** and **30A** Plans is maintained within negligible levels;

b) that the integrity of the above-mentioned Plans and their future modifications is to be ensured;

c) that non-GSO systems should not be entered into those Plans and therefore should not apply the procedures associated with the Plans and should not be protected by those procedures;

d) that this Conference has decided to introduce in Article **S5** of the Radio Regulations a new allocation to the FSS in the frequency bands 11.7-12.5 GHz in Region 1, 12.2-12.7 GHz in Region 2 and 11.7-12.2 GHz in Region 3, limited to non-GSO FSS systems,

resolves

1.

1.1 that, as of 22 November 1997, a non-GSO FSS system operating in the frequency bands covered by Appendices **30** and **30A** shall comply with the provisional limits specified in Article **S22** and in the Annex to this Resolution;

1.2 that such a system shall, as of the end of the 1999 World Radiocommunication Conference (WRC-99), comply with the limits specified in Article **S22,** as revised, if appropriate, by WRC-99, irrespective of the date of receipt of the complete notification information relating to the non-GSO FSS system;

1.3 that as of 22 November 1997, in applying No. **S22.2** of the Radio Regulations, administrations may consider these provisional power limits as corresponding to permissible levels of interference from a non-GSO system into a GSO system, irrespective of the dates of receipt by the Bureau of the complete notification information for the non-GSO system and for the GSO network;

1.4 that as of the end of WRC-99, an administration operating a non-GSO FSS system in the band 17.8-18.1 GHz (space-to-Earth) which is in compliance with the limits appearing in Article **S22** as revised, if appropriate, by WRC-99, shall be considered as having fulfilled its obligations under No. **S22.2** with respect to any GSO network operating in the Earth-to-space direction, irrespective of the dates of receipt by the Bureau of the complete notification information for the non-GSO system and of the complete coordination or notification information, as appropriate, for the GSO network;

1.5 that between 22 November 1997 and the end of WRC-99, if an administration operating or bringing into use a GSO system before the end of WRC-99 considers that a non-GSO FSS system proposed by another administration might cause unacceptable interference into its GSO system, then:

– the administration operating the GSO system shall send to the administration operating the non-GSO FSS system the technical details upon which its disagreement is based;

– the administration operating the non-GSO FSS system shall resolve the difficulties, taking into account especially degradation of picture and sound quality or signal availability with regard to GSO systems in operation;

1.6 that, as of 22 November 1997, a non-GSO FSS system operating in the frequency bands covered by Appendices **30** and **30A** shall apply the procedures of Sections I and III of Article **11**/Section I of Article **S9**, and Nos. **S9.17** and **S9.17A**, and the procedures of Article **13**/**S11** of the Radio Regulations;

1.7 that, as of 22 November 1997, such a system shall be subject, for the coordination with non-GSO systems, to the application of the provisions of § 2.1 of Section II of Resolution **46 (WRC-97)**/No. **S9.12** of the Radio Regulations;

1.8 that, as of 22 November 1997, such a system shall apply, using an equivalent power flux-density threshold of –185.3 dB(W/m^2/4 kHz) for 99.7% of the time, calculated with the reference 90 cm diameter antenna pattern provided in Annex 5 of Appendix **30** for Regions 1 and 3, the provisions of Article 7 of Appendix **30**/No. **S9.8** of the Radio Regulations with respect to assignments which appear in Article 11 of Appendix **S30** with the symbols AE or PE;

2. that non-GSO FSS systems in the frequency bands referred to in *resolves* 1. above shall not be operated before the end of WRC-99,

requests ITU-R

a) to conduct, as a matter of urgency and in time for consideration by WRC-99, the appropriate technical, operational and regulatory studies to review the regulatory provisions concerning the operation of non-GSO FSS systems in the frequency bands referred to in *resolves* 1.1 above in order to ensure that these provisions ensure appropriate protection of the Plans and their future modifications and do not place unreasonable constraints on the development of non GSO systems in these bands;

b) to undertake and complete the development of a methodology for calculating the power levels produced by non-GSO FSS systems and the compliance of these levels with the limits referred to in *resolves* 1.1 and 1.2 above;

c) to complete the studies relating to the sharing criteria to be applied for determining the need for coordination between non-GSO FSS systems, with a view to promoting efficient use of spectrum/orbit resources and equitable access to these resources by all countries;

d) to report to the 1999 Conference Preparatory Meeting (CPM-99) on the conclusion of these studies,

instructs the Radiocommunication Bureau

as of the end of WRC-99, to review and, if appropriate, revise, any finding previously made on the compliance with the limits contained in Article **S22** of a non-GSO FSS system for which notification information has been received between 22 November 1997 and the end of WRC-99. This review shall be based on the values in Article **S22**, as revised, if appropriate, by WRC-99.

ANNEX TO RESOLUTION 538 (WRC-97)

Provisional limits

Section I. Control of interference to geostationary-satellite systems

1.1 In the frequency band 17.8-18.1 GHz, the maximum aggregate power flux-density produced at the geostationary-satellite orbit by all the space stations in a non-geostationary-satellite system in the fixed-satellite service shall not exceed the values given in Table 2.

1.2 The equivalent power flux-density[1], at any point on the Earth's surface visible from the geostationary-satellite orbit, produced by emissions from all the space stations of a non-geostationary-satellite system in the fixed-satellite service in the frequency bands listed in Table 1, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall not exceed the limits given in Table 1 for the given percentages of time.

---

[1] The equivalent power flux-density is defined as the sum of the power flux-densities produced at a point on the Earth's surface by all space stations within a non-geostationary-satellite system, taking into account the off-axis discrimination of a reference receiving antenna assumed to be pointing towards the geostationary-satellite orbit. The equivalent power flux-density is calculated using the following formula:

$$epfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N_s} 10^{pfd_i/10} \cdot \frac{G_r(\theta_i)}{G_{max}}\right]$$

where:

N_s: number of non-geostationary space stations visible from the point considered at the Earth's surface, within an elevation angle greater than or equal to 0°;

i: index of the non-geostationary space station considered;

pfd_i: power flux-density produced at the point considered on the Earth's surface in dB(W/m^2) in the reference bandwidth;

θ_i: angle between the direction considered towards the geostationary-satellite orbit and the direction of the interfering space station in the non-geostationary-satellite system;

$G_r(\theta_i)$: gain (as a ratio) of the receive reference antenna to be considered as part of a geostationary-satellite network;

G_{max}: maximum gain (as a ratio) of the above receive reference antenna;

$epfd$: computed equivalent power flux-density in dB(W/m^2) in the reference bandwidth.

These limits relate to the equivalent power flux-density which would be obtained under free-space propagation conditions, into a reference antenna and in the reference bandwidth as specified in Table 1, for all pointing directions towards the geostationary-satellite orbit.

NOTE - Table 1 contains provisional limits corresponding to an interference level caused by one non-geostationary fixed-satellite service system in the frequency bands to be applied in accordance with this Resolution. These provisional limits are subject to review by ITU-R and are subject to confirmation by the 1999 World Radiocommunication Conference.

TABLE 1

Frequency band allocated to the broadcasting-satellite service	Antenna diameter (cm)	Equivalent pfd level ($dB(W/m^2/4kHz)$) which may not be exceeded during the percentage of time shown		Reference antenna radiation pattern
		99.7%	100%	
11.7-12.5 GHz in Region 1, 11.7-12.2 GHz and 12.5-12.75 GHz in Region 3	30 60 90	–172.3 –183.3 –186.8	–169.3 –170.3 –170.3	Recommendation ITU-R BO.1213
12.2-12.7 GHz in Region 2	45 100 120 180	–174.3 –186.3 –187.9 –191.4	–165.3 –170.3 –170.3 –170.3	§ 3.7.2 of Annex 5 of Appendix **30/S30**
17.3-17.8 GHz in Region 2	For further study[1)]			

[1)] The interference from non-GSO FSS systems into GSO BSS systems operating in the frequency bands 17.3-17.8 GHz relates to the two following sharing situations:

– non-GSO FSS transmit earth station into GSO receive earth station;

– GSO BSS transmit space station into non-GSO FSS receive space stations.

Both situations need to be studied, in particular since coexistence of receive BSS earth stations and large numbers of transmit non-GSO FSS terminals would not be feasible within the same country

1.3 The aggregate power flux-density[1] produced at any point in the geostationary-satellite orbit by emissions from all the earth stations in a non-geostationary-satellite system in the fixed-satellite service, for all conditions and for all methods of modulation, shall not exceed the limits given in

---

[1] The aggregate power flux-density is defined as the sum of the power flux-densities produced at a point in the geostationary-satellite orbit by all the earth stations of a non-geostationary-satellite system. The aggregate power flux-density is computed by means of the following formula:

$$apfd = 10 \cdot \log_{10}\left[\sum_{i=1}^{N_e} 10^{P_i/10} \cdot \frac{G_t(\theta_i)}{4\,\pi\,{d_i}^2}\right]$$

where:

N_e: number of earth stations in the non-geostationary-satellite system with an elevation angle greater than or equal to 0°, from which the point considered in the geostationary-satellite orbit is visible;

i: index of the earth station considered in the non-geostationary-satellite system;

P_i: RF power at the input of the transmitting antenna of the earth station considered in the non-geostationary-satellite system in dBW in the reference bandwidth;

θ_i: off-axis angle between the boresight of the earth station considered in the non-geostationary-satellite system and the direction of the point considered in the geostationary-satellite orbit;

$G_t(\theta_i)$: transmit antenna gain (as a ratio) of the earth station considered in the non-geostationary-satellite system in the direction of the point considered in the geostationary-satellite orbit;

d_i: distance in metres between the earth station considered in the non-geostationary-satellite system and the point considered in the geostationary-satellite orbit;

apfd: aggregate power flux-density in dB(W/m^2) in the reference bandwidth.

Table 2 for the specified percentages of time. These limits relate to the power flux-density which would be obtained under free-space propagation conditions in the reference bandwidth specified in Table 2.

NOTE - Table 2 contains provisional limits corresponding to an interference level caused by one non-geostationary fixed-satellite service system in the frequency bands to be applied in accordance with this Resolution. These provisional limits are subject to review by ITU-R and are subject to confirmation by the 1999 World Radiocommunication Conference.

TABLE 2

Frequency band (GHz)	Aggregate pfd dB(W/m^2/4 kHz)	Percentage of time during which aggregate pfd level may not be exceeded
17.3-18.1 in Regions 1 and 3 and 17.8-18.1 in Region 2	–163	100%

1.4 The limits given in Table 1 may be exceeded on the territory of any country whose administration has so agreed.

RESOLUTION 644 (WRC-97)

Telecommunication resources for disaster mitigation and relief operations

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that ITU, in the same spirit as reflected in Articles 40 and 46 of its Constitution and in Resolution **209 (Mob-87)**, has specifically recognized the importance of the international use of radiocommunications in the event of natural disasters, epidemics, famines and similar emergencies;

b) that the Plenipotentiary Conference (Kyoto, 1994), in endorsing Resolution 7 of the World Telecommunication Development Conference (Buenos Aires, 1994), adopted Resolution 36 on telecommunications for disaster mitigation and disaster relief operations;

c) that administrations have been urged to take all practical steps to facilitate the rapid deployment and effective use of telecommunication resources for disaster mitigation and disaster relief operations by reducing and, where possible, removing regulatory barriers and strengthening transborder cooperation between States,

recognizing

a) the potential of modern telecommunication technologies as an essential tool for disaster mitigation and relief operations and the vital role of telecommunications for the safety and security of relief workers in the field;

b) the particular needs of developing countries and the special requirements of the inhabitants of remote areas;

c) the progress made in the implementation of Resolution 36 with respect to the preparation of the Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations,

noting

with appreciation the scheduling of the Intergovernmental Conference on Emergency Telecommunications (ICET-98) from 16 to 18 June 1998 in Tampere, Finland, which is expected to adopt the Convention referred to in *recognizing c)* above,

resolves

to invite ITU-R to continue to study, as a matter of urgency, those aspects of radiocommunications that are relevant to disaster mitigation and relief operations, such as decentralized means of communications that are appropriate and generally available, including amateur radio facilities and mobile and portable satellite terminals,

requests the Director of the Radiocommunication Bureau

to support administrations in their work towards the implementation of Resolution 36,

instructs the Secretary-General

to work closely with the United Nations Emergency Relief Coordinator with a view to further increasing the Union's involvement in, and support to, disaster communications, and to report on the outcome of the Tampere Conference to the 1998 Plenipotentiary Conference so that that Conference or the ITU Council may take any action that it deems necessary,

invites

the United Nations Emergency Relief Coordinator and the Working Group on Emergency Telecommunications to collaborate closely with ITU in further work towards the implementation of Resolution 36, and in particular the adoption of the Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations,

urges administrations

to give their full support to the adoption of the said Convention and its national implementation.

RESOLUTION 715 (Rev.WRC-97)

Studies concerning sharing between the radionavigation-satellite service and the mobile-satellite service in the bands 149.9-150.05 MHz and 399.9-400.05 MHz

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the bands 149.9-150.05 MHz and 399.9-400.05 MHz are allocated to and used by the radionavigation-satellite service (RNSS) on a primary basis;

b) that this Conference allocated the bands 149.9-150.05 MHz and 399.9-400.05 MHz (Earth-to-space) to the mobile-satellite service (MSS) on a primary basis;

c) that requirements of the RNSS and the MSS should be met in these frequency bands;

d) that there may be difficulties in the sharing between the RNSS and the MSS, and studies are being carried out by ITU-R;

e) that there is a need for further study of the operational and technical means to facilitate sharing between the RNSS and the MSS (in the Earth-to-space and space-to-Earth directions) in these bands,

recognizing

that No. **953/S4.10** of the Radio Regulations applies to the use of these bands by the RNSS,

resolves

to invite ITU-R to continue to carry out studies in order to finalize Recommendations which identify the operational and technical measures necessary to facilitate sharing between the MSS and the RNSS,

urges administrations

to participate in such studies by submitting contributions to ITU-R relating to the above-mentioned studies as soon as possible.

RESOLUTION 721 (WRC-97)

Agenda for the 1999 World Radiocommunication Conference

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that, in accordance with Nos. 118 and 126 of the Convention of the International Telecommunication Union (Geneva, 1992), the general scope of the agenda for a world radiocommunication conference should be established four years in advance and a final agenda shall be established two years before the conference;

b) Article 13 of the Constitution of the International Telecommunication Union (Geneva, 1992) regarding the competence and scheduling of world radiocommunication conferences and Article 7 of the Convention (Geneva, 1992) regarding their agendas;

c) the relevant Resolutions and Recommendations of previous world administrative radio conferences (WARCs) and world radiocommunication conferences (WRCs),

recognizing

a) that this Conference has identified a number of urgent issues requiring further examination by the 1999 World Radiocommunication Conference (WRC-99);

b) that in preparing this agenda, many proposals from administrations could not be included and have had to be deferred to future conference agendas,

resolves

to recommend to the Council that a world radiocommunication conference be held in late 1999[1] for a period of four weeks, with the following agenda:

1. on the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, taking account of the results of the 1997 World Radiocommunication Conference (WRC-97), and with due regard to the requirements of existing and future services in the bands under consideration, to consider and take appropriate action in respect of the following topics:

1.1 requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, in accordance with Resolution **26 (Rev.WRC-97)**;

1.2 to finalize remaining issues in the review of Appendix **S3** to the Radio Regulations with respect to spurious emissions for space services, taking into account Recommendation **66 (Rev.WRC-97)** and the decisions of WRC-97 on adoption of new values, due to take effect at a future time, of spurious emissions for space services;

1.3 to consider the results of ITU-R studies in respect of Appendix **S7/28** on the method for the determination of the coordination area around an earth station in frequency bands shared among space services and terrestrial radiocommunication services, and take the appropriate decisions to revise this Appendix;

1.4 to consider issues concerning allocations and regulatory aspects related to Resolutions **126 (WRC-97), 128 (WRC-97), 129 (WRC-97), 133 (WRC-97), 134 (WRC-97)** and **726 (WRC-97)**;

---

[1] See Resolution **50 (WRC-97)**.

1.5 to consider regulatory provisions and possible additional frequency allocations for services using high altitude platform stations, taking into account the results of ITU-R studies conducted in response to Resolution **122 (WRC-97)**;

1.6 issues related to IMT-2000;

1.6.1 review of spectrum and regulatory issues for advanced mobile applications in the context of IMT-2000, noting that there is an urgent need to provide more spectrum for the terrestrial component of such applications and that priority should be given to terrestrial mobile spectrum needs, and adjustments to the Table of Frequency Allocations as necessary;

1.6.2 identification of a global radio control channel to facilitate multimode terminal operation and worldwide roaming of IMT-2000;

1.7 review of the use of the HF bands by the aeronautical mobile (R) and maritime mobile services with a view to protecting operational, distress and safety communications, taking into account Resolution **346 (WRC-97)**;

1.8 to consider regulatory and technical provisions to enable earth stations located on board vessels to operate in the fixed-satellite service (FSS) networks in the bands 3 700-4 200 MHz and 5 925-6 425 MHz, including their coordination with other services allocated in these bands;

1.9 to take into account the results of ITU-R studies in evaluating the feasibility of an allocation in the space-to-Earth direction to the mobile-satellite service (MSS) in a portion of the 1 559-1 567 MHz frequency range, in response to Resolutions **213 (WRC-97)** and **220 (WRC-97)**;

1.10 to consider results of ITU-R studies carried out in accordance with Resolution **218 (WRC-97)** and take appropriate action on this subject;

1.11 to consider constraints on existing allocations and to consider additional allocations on a worldwide basis for the non-geostationary (non-GSO) MSS below 1 GHz , taking into account the results of ITU-R studies conducted in response to Resolutions No. **214 (Rev.WRC-97)** and **219 (WRC-97)**;

1.12 to consider the progress of studies on sharing between feeder links of non-GSO MSS networks and GSO FSS networks in the bands 19.3-19.7 GHz and 29.1-29.5 GHz, taking into account Resolution **121 (Rev. WRC-97)**;

1.13 on the basis of the results of the studies in accordance with Resolutions **130 (WRC-97)**, **131 (WRC-97)** and **538 (WRC-97)**:

1.13.1 to review and, if appropriate, revise the power limits appearing in Articles **S21** and **S22** in relation to the sharing conditions among non-GSO FSS, GSO FSS, GSO broadcasting-satellite service (BSS), space sciences and terrestrial services, to ensure the feasibility of these power limits and that these limits do not impose undue constraints on the development of these systems and services;

1.13.2 to consider the inclusion in other frequency bands of similar limits in Articles **S21** and **S22**, or other regulatory approaches to be applied in relation to sharing situations;

1.14 to review the results of the studies on the feasibility of implementing non-GSO MSS feeder links in the 15.43-15.63 GHz in accordance with Resolution **123 (WRC-97)**;

1.15 issues related to the radionavigation-satellite service:

1.15.1 to consider new allocations to the radionavigation-satellite service in the range from 1 GHz to 6 GHz required to support developments;

1.15.2 to consider the addition of the space-to-space direction to the radionavigation-satellite service allocations in the bands 1 215-1 260 MHz and 1 559-1 610 MHz;

1.15.3 to consider the status of allocations to services other than the radionavigation-satellite service (Nos. **S5.355** and **S5.359**) in the band 1 559-1 610 MHz;

1.16 to consider allocation of frequency bands above 71 GHz to the earth exploration-satellite (passive) and radio astronomy services, taking into account Resolution **723 (WRC-97)**;

1.17 to consider possible worldwide allocation for the earth exploration-satellite (passive) and space research (passive) services in the band 18.6-18.8 GHz, taking into account the results of the ITU-R studies;

1.18 to consider the use of new digital technology for the maritime mobile service in the band 156-174 MHz and consequential revision of Appendix **18/S18**, taking into account Resolution **342 (WRC-97)**;

1.19 to consider the report of the Inter-conference representative group (IRG) submitted by the Director of the Radiocommunication Bureau and determine whether it is possible to undertake replanning in accordance with Resolution **532 (WRC-97)** for completion by a subsequent competent conference;

1.20 to consider the issues related to the application of Nos. **S9.8**, **S9.9** and **S9.17** and the corresponding parts of Appendix **S5** with respect to Appendices **S30** and **S30A**, with a view to possible deletion of Articles 6 and 7 of Appendices **S30** and **S30A**, also taking into consideration Recommendation **35 (WRC-95)**;

1.21 to consider the Report from the Radiocommunication Bureau on results of the analysis in accordance with Resolution **53 (WRC-97)** and take appropriate actions;

2. to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations which have been communicated by the 1999 Radiocommunication Assembly, in accordance with Resolution **28 (WRC-95)**; and decide whether or not to update the corresponding references in the Radio Regulations, in accordance with principles contained in the Annex to Resolution **27 (Rev.WRC-97)**;

3. to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;

4. in accordance with Resolution **95 (WRC-97)**, to review the Resolutions and Recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

5. to review, and take appropriate action on, the report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention (Geneva, 1992);

6. to identify those items requiring urgent actions by the radiocommunication study groups in preparation for the 2001 World Radiocommunication Conference (WRC-01);

7. in accordance with Article 7 of the Convention (Geneva, 1992):

7.1 to consider and approve the Report of the Director of the Radiocommunication Bureau on the activities of the Radiocommunication Sector since WRC-97;

7.2 to recommend to the Council items for inclusion in the agenda for WRC-01, and to give its views on the preliminary agenda for the 2003 Conference and on possible agenda items for future conferences,

further resolves

8. to recommend to the Council that extra budgetary and conference resources be provided so that the following items can be included in this agenda for WRC-99:

8.1 to consider the regulatory and technical provisions for the quasi-geostationary satellite networks;

8.2 to examine the spectrum requirements for telemetry, tracking, and telecommand of FSS networks operating with service links in the frequency bands above 17 GHz;

8.3 to review the use of the frequency band 415-526.5 kHz by the aeronautical radionavigation and maritime mobile services;

8.4 to review the use of the HF bands by the aeronautical mobile (R) and maritime mobile services with a view to meeting the changing needs of these services;

8.5 to consider possible extension of the allocation to the MSS (Earth-to-space) on a secondary basis in the band 14.0-14.5 GHz to cover aeronautical applications as stipulated in Resolution **216 (WRC-97)**;

8.6 to consider the provision of up to 3 MHz of frequency spectrum for the implementation of telecommand links in the space research and space operation services in the frequency range between 100 MHz and 1 GHz, taking into account Resolution **723 (WRC-97)**;

8.7 to consider provision of up to 6 MHz of frequency spectrum to the earth exploration-satellite service (active) in the frequency band 420-470 MHz, in accordance with Resolution **727 (WRC-97)**;

8.8 consideration of changes to the allocations in Region 3 for the band 1 350-1 400 MHz to permit co-primary use by the fixed service,

invites the Council

to finalize the agenda and arrange for the convening of WRC-99 and to initiate as soon as possible the necessary consultation with Member States,

instructs the Director of the Radiocommunication Bureau

to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting and to prepare a Report to WRC-99,

instructs the Secretary-General

to communicate this Resolution to concerned international and regional organizations.

RESOLUTION 722 (WRC-97)

Preliminary Agenda for the 2001 World Radiocommunication Conference

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that, in accordance with Nos. 118 and 126 of the Convention of the International Telecommunication Union (Geneva, 1992), the general scope of the agenda for the 2001 World Radiocommunication Conference (WRC-01) should be established four years in advance;

b) Article 13 of the Constitution of the International Telecommunication Union (Geneva, 1992) regarding the competence and scheduling of world radiocommunication conferences and Article 7 of the Convention (Geneva, 1992) regarding their agendas;

c) the relevant Resolutions and Recommendations of previous world administrative radio conferences (WARCs) and world radiocommunication conferences (WRCs),

resolves to give the view

that the following items should be included in the preliminary agenda of WRC-01, to be held in late 2001:

1. to take appropriate action in respect of those urgent issues that were specifically requested by the 1999 World Radiocommunication Conference (WRC-99);

2. on the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, and taking account of the results of WRC-99, to consider and take appropriate action in respect of the following topics:

2.1 requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, taking into account Resolution **26 (Rev.WRC-97)**;

2.2 consideration of Article **S25** concerning the amateur and amateur-satellite services;

2.3 issues related to Appendix **S3**:

2.3.1 to consider the results of studies regarding the boundary between spurious and out-of-band emissions;

2.3.2 to consider the inclusion of general limits for out-of-band emissions in the Radio Regulations, in particular with regard to whether it is appropriate to do so, taking into account the results of ITU-R studies;

2.4 review of the frequency and channel arrangements in the MF and HF bands allocated on a primary basis to the maritime mobile service, taking into account the use of new digital technology, in accordance with Resolution **347 (WRC-97)**;

2.5 to review in Appendix **7/S2** the Table of Transmitter Frequency Tolerances, taking into account the frequency tolerance limits specified in Recommendation ITU-R SM.1045;

2.6 to consider the status of allocations to the radiolocation service in the bands around 3.0 GHz and around 5.5 GHz, the date of a conference is under discussion;

2.7 sharing between the fixed-satellite service (FSS) and fixed service in the 19 GHz band, when used bidirectionally by the FSS to provide feeder links for non-geostationary-satellite orbit (non-GSO) mobile-satellite service (MSS) systems;

2.8 to consider spectrum requirements for wideband aeronautical telemetry in the band between 3 GHz and 30 GHz;

2.9 review of allocations to the space-research service (deep space) (space-to-Earth) and the inter-satellite service in the frequency range 32-32.3 GHz with a view to improving the sharing conditions between these services;

2.10 to consider Appendix **S13** and Resolution **331 (Rev.WRC-97)** with a view to their deletion and, if appropriate, consider related changes to Chapter **SVII** and other provisions of the Radio Regulations as necessary, taking into account the continued transition to the Global Maritime Distress and Safety System (GMDSS);

2.11 to consider the results of studies, and take necessary actions relating to:

2.11.1 the exhaustion of the maritime mobile service identity numbering resource (Resolution **344 (WRC-97)**);

2.11.2 shore-to-ship distress communication priorities (Resolution **348 (WRC-97)**);

2.12 consideration of the need to realign the allocations to the amateur, amateur-satellite and broadcasting services around 7 MHz on a world-wide basis, taking into account Recommendation **718 (WARC-92)**;

2.13 examination of the adequacy of the frequency allocations for HF broadcasting from about 4 MHz to 10 MHz, taking into account the seasonal planning procedures adopted by WRC-97, and to consider bringing forward the date of availability of the HF bands allocated by WARC-92 to the broadcasting service in response to Resolution **29 (WRC-97)** and Resolution **537 (WRC-97)**;

3. to consider the results of the studies related to the following with a view to considering them for inclusion in the agendas of future conferences:

3.1 Resolution **528 (WARC-92)**;

3.2 possible allocations in the frequency bands above 275 GHz;

3.3 potential for sharing around 4 300 MHz between radio altimeters and space-based passive earth sensors;

3.4 additional allocations on a worldwide basis for the non-GSO MSS with service links operating below 1 GHz in accordance with Resolution **728 (WRC-97)**;

3.5 allocations on a worldwide basis for feeder links in bands around 1.4 GHz to the non-GSO MSS with service links operating below 1 GHz, taking into account the results of ITU-R studies conducted in response to Resolution **127 (WRC-97)**;

3.6 use of frequency adaptive systems in the MF/HF bands in accordance with Resolution **729 (WRC-97)**;

3.7 allocation of the frequency band 14.5-14.8 GHz to the FSS (Earth-to-space) in Region 3 (expansion of FSS to include other than feeder links of the broadcasting-satellite service);

4. to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations which have been communicated by the 2001 Radiocommunication Assembly, in accordance with Resolution **28 (WRC-95)**; and decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in the Annex to Resolution **27 (Rev.WRC-97)**;

5. to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;

6. in accordance with Resolution **95 (WRC-97)**, to review the Resolutions and Recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

7. to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention (Geneva, 1992);

8. to identify those items requiring urgent action by the radiocommunication study groups;

9. in accordance with Article 7 of the Convention (Geneva, 1992):

9.1 to consider and approve the Report of the Director of the Radiocommunication Bureau on the activities of the Radiocommunication Sector since WRC-99;

9.2 to recommend to the Council items for inclusion in the agenda for the 2003 World Radiocommunication Conference,

invites the Council

to consider the views given in this Resolution,

instructs the Director of the Radiocommunication Bureau

to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting and to prepare a Report to WRC-01,

instructs the Secretary-General

to communicate this Resolution to concerned international and regional organizations.

RESOLUTION 723 (WRC-97)

Consideration by a future competent world radiocommunication conference of issues dealing with allocations to science services

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that this Conference recognized the importance of proper consideration of science service issues based on technical and operational criteria developed in ITU-R study groups;

b) that circumstances did not enable the completion of all necessary studies relating to a number of proposals concerning science services;

c) that a deficiency in telecommand (uplink) frequency allocations exists, compared to available telemetry (downlink) allocations in the 100 MHz to 1 GHz range;

d) that additional frequency bands above 71 GHz are needed to satisfy user requirements for passive sensing of the Earth's environmental conditions,

resolves

that, on the basis of proposals from administrations and taking into account the results of studies in ITU-R study groups and the 1999 Conference Preparatory Meeting, the 1999 World Radiocommunication Conference should consider the following matters:

1) provision of up to 3 MHz of frequency spectrum for the implementation of telecommand links in the space research and space operations services in the frequency range 100 MHz to 1 GHz;

2) allocation of frequency bands above 71 GHz to the earth exploration-satellite (passive) and space research (passive) services and the radio astronomy service,

invites ITU-R study groups

to complete the necessary studies, as a matter of urgency, taking into account the present use of allocated bands, with a view to presenting, at the appropriate time, the technical information likely to be required as a basis for the work of the Conference,

instructs the Secretary-General

to bring this Resolution to the attention of the international and regional organizations concerned.

RESOLUTION 724 (WRC-97)

Use of the frequency band 5 250-5 350 MHz by spaceborne active sensors

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the frequency band 5 250-5 350 MHz is allocated to the radiolocation service on a primary basis;

b) that the frequency band 5 250-5 350 MHz is also allocated to the earth exploration-satellite (active) and the space research (active) services on a primary basis;

c) that the Report of the Conference Preparatory Meeting to this Conference concluded that terrestrial radars would not cause unacceptable interference to synthetic aperture radars, scatterometers or altimeters, and that active spaceborne sensors and radiolocation systems are compatible provided that spaceborne-synthetic aperture radar and scatterometer design parameters are appropriately selected to ensure compatibility with radiolocation systems;

d) that guidelines for the appropriate selection of these parameters are contained in Recommendation ITU-R SA.1280;

e) that spaceborne sensors have operated in this frequency band since 1991 with no known reports of interference;

f) that many administrations have radiolocation systems operating in this band,

resolves

1. to invite ITU-R to study, as a matter of urgency, specific sharing criteria and emission characteristics for spaceborne active sensors operating in this frequency band, which may be added to Recommendation ITU-R SA.1280;

2. that when developing spaceborne active sensors operating in this frequency band, administrations should take into account the guidelines for the design of spaceborne active sensors found in Recommendation ITU-R SA.1280.

RESOLUTION 725 (WRC-97)

Use of the frequency band 5 350-5 460 MHz by spaceborne active sensors

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the frequency band 5 350-5 460 MHz is allocated to the aeronautical radionavigation service on a primary basis;

b) that the frequency band 5 350-5 460 MHz is also allocated to the earth exploration-satellite (active) service on a primary basis;

c) that the Report of the Conference Preparatory Meeting (CPM) to this Conference concluded that spaceborne altimeters and aeronautical radionavigation systems are compatible in this frequency band;

d) that the Report of the CPM to this Conference concluded that spaceborne synthetic aperture radars and airborne weather radars operating in the aeronautical radionavigation service are compatible in this frequency band;

e) that guidelines for the appropriate selection of design parameters of active spaceborne sensors are contained in Recommendation ITU-R SA.1280,

resolves

to invite ITU-R to study specific sharing criteria and emission characteristics for spaceborne active sensors operating in the frequency band 5 350-5 460 MHz, with a view to providing further guidance on the matter of compatibility with aeronautical radionavigation systems which will assist in the design of spaceborne active sensors and may add to Recommendation ITU R SA.1280.

RESOLUTION 726 (WRC-97)

Frequency bands above 30 GHz available for high-density applications in the fixed service

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that there is a dramatically increasing demand for high-density applications in the fixed service resulting from the deployment of new mobile networks and from the rapid worldwide deregulation in the provision of local broadband services, including multimedia;

b) that the frequency range from 30 GHz to about 50 GHz is the range preferred to satisfy initial requirements, as indicated in *considering a)*, while the bands above about 50 GHz are preferred for similar applications but which take technical advantage of high atmospheric absorption;

c) that the lower part of the spectrum above 30 GHz has advantages for the fixed service in areas where longer path lengths are necessary;

d) that the 38 GHz band is already heavily used by many administrations for high-density applications in the fixed service;

e) that the needs of other services to which the relevant frequency bands are already allocated must be taken into account;

f) that the band 37-37.5 GHz is being planned for use by the space research service (space-to-Earth) to provide moon-to-Earth and planetary communication links;

g) that the band 37-38 GHz is being planned for use by the space research service to provide space based very long baseline interferometry;

h) that the deployment of high-density applications in the fixed service in some bands potentially presents sharing difficulties with other primary services

allocated to the same band, e.g. the fixed-satellite service;

i) that operations in the space services, such as in the fixed-satellite service, in those bands used by high-density applications in the fixed service may lead to sharing difficulties;

j) that there is a need for global harmonization of new and existing allocations of radio frequency bands to facilitate coordination between administrations and encourage development of competitive products, through economies of scale, and the worldwide introduction of new telecommunication services, including the provision of reliable global information infrastructure access at an affordable cost,

resolves

that administrations should take into account that the bands 31.8-33.4 GHz*, 51.4-52.6 GHz, 55.78-59 GHz and 64-66 GHz are available for high-density applications in the fixed service, when considering allocations or other regulatory provisions in relation to these bands,

requests ITU-R

1. to undertake studies leading to the identification of system characteristics of high-density systems in the fixed service in the bands listed in the *resolves*;

2. to undertake, as a matter of urgency, studies of technical and operational criteria and of methods to facilitate sharing between high-density systems in the fixed service and other services in the bands listed in the *resolves*,

urges administrations

to participate actively in the aforementioned studies by submitting contributions to ITU-R.

---

* The date of provisional application of this allocation shall be in conformity with Resolution **126 (WRC-97)**.

RESOLUTION 727 (WRC-97)

Use of the frequency band 420-470 MHz by the earth exploration-satellite (active) service

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the United Nations Conference on Environment and Development (UNCED) (Rio de Janeiro, 1992) identified an urgent need for assessment and systematic observations of forest cover and rate of forest degradation in tropical and temperate regions;

b) that, during this Conference, many countries agreed to the principle that ITU should take action in response to the need identified by UNCED;

c) that frequencies around 450 MHz have been identified as having the unique capability to penetrate the canopy of forests and to determine the ground-trunk interaction;

d) that a bandwidth of about 6 MHz is considered necessary to provide the required resolution,

recognizing

a) that this Conference considered a proposal for a secondary allocation for the earth exploration-satellite (active) service within the frequency band 432-438 MHz;

b) that the Report of the 1997 Conference Preparatory Meeting (CPM-97) stated that this Conference may deem it appropriate to defer consideration of this agenda item to the 1999 World Radiocommunication Conference (WRC-99), by which time all relevant studies should be completed;

c) that CPM-97 concluded that spaceborne sensors cannot be considered technically compatible with terrestrial tracking radars without restriction on the spaceborne sensors;

d) that measures may be needed to minimize interference to fixed, mobile, mobile-satellite, amateur, amateur-satellite and space operation services,

resolves

1. to invite ITU-R to study, as a matter of urgency, emission criteria, specific sharing criteria and operational characteristics for spaceborne sensors in the frequency band 420-470 MHz, and develop a relevant Recommendation;

2. to invite ITU-R to develop an ITU-R Report by the date of the 1999 Conference Preparatory Meeting (CPM-99) on the specific emission and operational characteristics used by the earth exploration-satellite (active) service in order to minimize the potential interference to existing services, and in order to support the selection of a frequency band having the optimal sharing scenarios;

3. that, on the basis of proposals from administrations, and taking into account the results of the ITU-R studies, the ITU-R Report mentioned in *resolves* 2., and the CPM-99 Report, WRC-99 should consider provision of up to 6 MHz of frequency spectrum to the earth exploration-satellite (active) service in the frequency band 420-470 MHz.

RESOLUTION 728 (WRC-97)

Studies relating to consideration of allocations in the broadcasting band 470-862 MHz to non-geostationary mobile-satellite services

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the agenda of this Conference included consideration of the adoption of additional allocations for non-geostationary mobile-satellite services (non-GSO MSS);

b) that the Report of the 1997 Conference Preparatory Meeting (CPM-97) stated that the Radiocommunication Bureau has identified at least 23 non-GSO MSS networks at frequencies below 1 GHz, at some stage of coordination under Resolution **46**, and that many of the proposed networks cannot be implemented in the existing allocations because there is not enough spectrum;

c) that CPM-97 considered the protection requirements for analogue television in the band 470-862 MHz against a narrow-band MSS signal in the most sensitive and least sensitive portions of an analogue television channel and the protection requirements for a digital television channel, based on existing Recommendations ITU-R BT.655-4, ITU-R BT.417-4 and ITU-R IS.851-1;

d) that CPM-97 stated that the protection ratios for a narrow-band interfering signal in the least sensitive parts of an analogue television channel are to be verified by further studies;

e) that CPM-97 stated the region of lower protection requirements and commensurately higher permissible interfering power flux-density levels as being 100 kHz from the band edges of an analogue television channel, at least in some countries;

f) that CPM-97 stated that the interfering effects of a non-GSO MSS transmission will depend on its specific characteristics (e.g. duty-cycle, duration, periodicity, etc.), that interference contributions from sources other than MSS (even those from other broadcasting stations) have to be taken into account, that slightly lower values of field strength to be protected may need to be assumed in countries where television networks are relatively sparse, and that studies on sharing are necessary;

g) that the permissible aggregate interfering power flux-density resulting from these protection requirements, in some portions of an analogue television channel, may be useful in determining the feasibility of sharing with non-GSO MSS transmitter space-to-Earth links;

h) that these bands are also allocated in part to fixed and mobile terrestrial systems and radionavigation systems;

i) that, in many countries, the channels assigned for analogue television may also be used for digital television, and that during the period of parallel operation of analogue and digital television networks the usage of this band for television will increase,

noting

a) that on completion of studies, parts of the bands now allocated to the broadcasting service between 470 MHz and 862 MHz might be considered suitable for worldwide allocation to non-GSO MSS space-to-Earth transmissions;

b) that the bandwidth required in these television channels may be 1-2% of the total band 470-862 MHz to be shared with the above systems;

c) the need to protect the radio astronomy service in the band 608-614 MHz against interference from MSS transmissions, including unwanted emissions,

resolves

1. to invite ITU-R to carry out studies to determine operational and technical means that may facilitate co-frequency sharing between narrow-band non-GSO MSS (space-to-Earth) transmissions and the services to which the band 470-862 MHz is allocated, including the bands where the broadcasting service is also allocated;

2. to invite a future competent conference to consider, on the basis of the results of the studies referred to in *resolves* 1., the possibility of making additional allocations on a worldwide basis for non-GSO MSS, taking into account, in particular, *considering h)* and *i)* above,

urges administrations

to participate actively in such studies, with the involvement of interested parties.

RESOLUTION 729 (WRC-97)

Use of frequency adaptive systems in the MF and HF bands

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the efficiency of spectrum use will be improved by the use of frequency adaptive systems in the MF and HF bands shared by the fixed and the mobile services;

b) that trials of frequency adaptive systems which have been undertaken during the past 20 years have demonstrated the feasibility of such systems and their improved spectrum efficiency;

c) that such improved efficiency is attained through:

– shorter call set-up and improved transmission quality by selection of the most suitable assigned channels;

– reduced channel occupancy, permitting the same channels to be used by different networks, yet decreasing the probability of harmful interference;

– minimization of the transmitter power required for each transmission;

– continued optimization of the emissions owing to the sophistication of the systems;

– simple operation by the use of intelligent peripheral equipment;

– reduced need for skilled radio operators;

d) that following Resolution **23 (WRC-95)**, the Bureau no longer undertakes examination with respect to the probability of harmful interference caused by new assignments recorded in the Master International Frequency Register (MIFR) in the non-planned bands below 28 MHz;

e) that frequency adaptive systems will actively contribute to the avoidance of interference since, when other signals are observed on the channel, the frequency adaptive system will move to another frequency,

resolves

1. that, in authorizing the operation of frequency adaptive systems in the MF and HF bands, administrations shall:

1.1 make assignments in the bands allocated to the fixed and mobile services;

1.2 not make assignments in the bands:

- allocated exclusively to the maritime or aeronautical mobile (R) services;
- shared on a co-primary basis with the broadcasting service, radiodetermination service or the amateur services;
- allocated to radio astronomy;

1.3 avoid use which may affect frequency assignments involving safety services made in accordance with Nos. **S5.155**, **S5.155A** and **S5.155B** of the Radio Regulations;

1.4 take into account any footnotes applicable to the proposed bands and the implications regarding compatibility;

2. that frequency adaptive systems shall automatically limit simultaneous use of frequencies to the minimum necessary for communication requirements;

3. that, with a view to avoiding harmful interference, the system should evaluate the channel occupancy prior to and during operation;

4. that frequency adaptive systems shall be notified to the Bureau in accordance with the provisions of Article **S11** of the Radio Regulations,

invites ITU-R

1. to pursue its studies on the subject (see, for example, Questions ITU-R 204-1/1, ITU-R 147-1/9, ITU-R 205/9 or ITU-R 214/9) with a view to achieving optimum operational performance and compatibility;

2. to report on the results of these studies to a future world radiocommunication conference,

instructs the Director of the Radiocommunication Bureau

to make the necessary arrangements, as soon as practicable, for the notification of frequency assignments to adaptive systems and for their recording in the MIFR, taking into account the studies already undertaken.

RECOMMENDATION 7 (Rev.WRC-97)

Adoption of standard forms for ship station and ship earth station licences and aircraft station and aircraft earth station licences[1, 2]

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the standardization of the licence forms issued to stations installed on board ships and aircraft making international voyages and flights would greatly facilitate the task of inspection of such stations;

b) that standard licence forms for ship stations and for aircraft stations would serve as a useful guide to those administrations desiring to improve their existing national licences;

c) that standard licence forms could be advantageously used by these administrations as the form of certification specified in No. **S18.8** of the Radio Regulations,

considering further

that the Administrative Radio Conference (Geneva, 1959), formulated:

a) a set of principles for the draft of a standard licence form (see Annex 1);

---

[1] Replaces Recommendation 17 of the Administrative Radio Conference (Geneva, 1959).

[2] Throughout this Recommendation, references to ship stations may include references to ship earth stations and references to aircraft stations may include references to aircraft earth stations.

b) specimens of a ship station licence and of an aircraft station licence (see Annexes 2 and 3),

considering also

changes in radio systems and shipborne radiocommunication equipment introduced in connection with the implementation of the Global Maritime Distress and Safety System (GMDSS),

recommends

1. that administrations which find these forms practicable and acceptable should adopt them for international use;

2. that administrations should, as far as possible, endeavour to bring their national licence forms into line with these standard forms.

ANNEX 1 TO RECOMMENDATION 7 (Rev.WRC-97)

Principles for the formulation of standard ship and aircraft station licences

The Administrative Radio Conference (Geneva, 1959), considered that, in formulating standard ship and aircraft station licences, the following set of principles should be applied:

1. The licence should, as far as possible, be prepared in tabular form, and each line and column of the table clearly numbered or lettered.

2. The licence for ship stations and the licences for aircraft stations should be as similar as possible.

3. The size of the licence should be international standard A4.

4. The licence should be designed in a form which facilitates its display on board a ship or an aircraft.

5. The licence should be printed in Latin characters in the national language of the country which issues it. Those countries whose national language cannot be written in Latin characters should use their national language and, in addition, English, Spanish or French.

6. The title “Ship Station Licence” or “Aircraft Station Licence” should appear at the top of the licence in the national language as well as in English, Spanish and French.

These principles were used in formulating the two standard forms which are given in Annexes 2 and 3.

ANNEX 2 TO RECOMMENDATION 7 (Rev.WRC-97)

(Full name of the authority issuing the licence, in the national language)
.....*

SHIP STATION LICENCE
LICENCE DE STATION DE NAVIRE
LICENCIA DE ESTACIÓN DE BARCO

No. .....
Period of validity .....

In accordance with (*Title of the National Regulation*) and with the Radio Regulations which complement the Constitution and the Convention of the International Telecommunication Union now in force, this authorization is herewith issued for the installation and for the use of the radio equipment described below:

1	2			3	4
	Identification of the ship station				
Name of ship	Call sign	MMSI	Other identification *(optional)*	Holder of licence	Accounting authority identification code, or additional information including accounting information if required

* The words “Ship Station Licence” written in the national language, if this is not English, Spanish or French.

	Equipment	Type or description of equipment	Frequencies
5	Transmitters		**
6	Other equipment *(optional)*		

For the Issuing Authority:

.....

Place Date Authentication

** Specifically or by reference to List V, columns 8 and 9.

ANNEX 3 TO RECOMMENDATION 7 (Rev.WRC-97)

(Full name of the authority issuing the licence,
in the national language)
..... *

AIRCRAFT STATION LICENCE
LICENCE DE STATION D'AÉRONEF
LICENCIA DE ESTACIÓN DE AERONAVE

No. .....
Period of validity .....

In accordance with (*Title of the National Regulation*) and with the Radio Regulations which complement the Constitution and the Convention of the International Telecommunication Union now in force, this authorization is herewith issued for the installation and for the use of the radio equipment described below:

1	2	3	4
Nationality and registration mark of the aircraft	Call sign or other identification	Type of aircraft	Owner of aircraft

* The words “Aircraft Station Licence” written in the national language, if this is not English, Spanish or French.

		a	b	c	d
	Equipment	Type	Power (watts)	Class of emission	Frequency bands or assigned frequencies
5	Transmitters				**
6	Survival craft transmitters *(when applicable)*				**
7	Other equipment	*(Optional)*			

For the Issuing Authority:

.....

Place Date Authentication

** Specifically or by reference.

RECOMMENDATION 36 (WRC-97)

Role of international monitoring in reducing apparent congestion in the use of orbit and spectrum resources

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the geostationary-satellite orbit and the radio-frequency spectrum are limited natural resources and are being increasingly utilized by space services;

b) the desirability of achieving a more effective use of the geostationary-satellite orbit and radio-frequency spectrum in order to assist administrations in satisfying their requirements and, to that end, the desirability of taking steps to make the International Frequency List reflect more accurately the actual use being made of these resources;

c) that monitoring information should assist ITU-R in discharging this function;

d) that facilities for monitoring of emissions originating from space stations are expensive,

recognizing

that an international monitoring system cannot be fully effective unless it covers all areas of the world,

invites ITU-R

to study and make recommendations concerning the facilities required to provide adequate coverage of the world with a view to ensuring efficient use of resources,

invites administrations

1. to make every effort to provide monitoring facilities as envisaged in Article **S16** of the Radio Regulations;

2. to inform ITU-R of the extent to which they are prepared to cooperate in such monitoring programmes as may be requested by ITU-R;

3. to consider the various aspects of monitoring emissions originating from space stations to enable the provisions of Articles **S21** and **S22** of the Radio Regulations to be applied.

RECOMMENDATION 66 (Rev.WRC-97)

Studies of the maximum permitted levels of unwanted emissions

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that Appendix **S3** to the Radio Regulations specifies the maximum permitted levels of spurious emissions, in terms of the mean power level of any spurious component supplied by a transmitter to the antenna transmission line;

b) that the principal objective of Appendix **S3** is to specify the maximum permitted levels of spurious emissions that, while being achievable, provide protection against harmful interference;

c) that excessive levels of unwanted emissions may give rise to harmful interference;

d) that while out-of-band emissions can also give rise to harmful interference, the Radio Regulations do not provide general limits for these emissions;

e) that while Appendix **S3** applies generally to the mean power of a transmitter and its spurious emissions, it also takes account of a variety of emissions where interpretation of the term "mean power", and thus its measurement, would be difficult, particularly in the cases of digital modulation broadband systems, pulsed modulation and narrow-band high-power transmitters;

f) that while Appendix **S3** covers spurious emissions for all radio services, those listed for space services are included only as design objectives;

g) that unwanted emissions from transmitters operating in space stations may cause harmful interference, particularly emissions from wideband amplifiers which cannot be adjusted after launch;

h) that unwanted emissions may cause harmful interference to safety services and radio astronomy and space services using passive sensors;

i) that, for technical or operational reasons, more stringent spurious emission limits than the general limits in Appendix **S3** may be required to protect specific services, such as safety services and passive services in specific bands;

j) that broadband digital modulation may cause unwanted emissions at frequencies far from the carrier frequency,

noting

a) that safety services and passive services have in many cases been allocated frequencies adjacent or close to those of services employing high-power transmitters;

b) that some administrations have adopted more stringent limits for spurious emissions than those specified in Appendix **S3**,

recommends that ITU-R

1. study, as a matter of urgency, the question of spurious emissions resulting from space service transmissions, and, on the basis of those studies, develop Recommendations for maximum permitted levels of spurious emissions in terms of mean power of spurious components supplied by the transmitter to the antenna transmission line;

2. submit a report to the 1999 World Radiocommunication Conference on the results of its studies with a view to reviewing and including spurious emission limits for space services in Appendix **S3** to the Radio Regulations;

3. continue the study of spurious emission levels in all frequency bands, emphasizing the study of those frequency bands, services and modulation techniques not presently covered by Appendix **S3**;

4. study the question of unwanted emissions resulting from transmitters of all services and all modulation methods, and, on the basis of those studies, develop a Recommendation or Recommendations for maximum permitted levels of spurious emissions and out-of-band emissions;

5. establish appropriate measurement techniques for unwanted emissions, where those techniques do not currently exist, including the determination of reference levels for wideband transmissions as well as the applicability of reference measurement bandwidths;

6. study the reasonable boundary of spurious emissions and out-of-band emissions with a view to defining such a boundary in Article **S1** of the Radio Regulations;

7. study those frequency bands and instances where, for technical or operational reasons, more stringent spurious emission limits than the general limits in Appendix **S3** may be required to protect safety services and passive services such as radio astronomy, and the impact on all concerned services of implementing or not implementing such limits;

8. study those frequency bands and instances where, for technical or operational reasons, out-of-band limits may be required to protect safety services and passive services such as radio astronomy, and the impact on all concerned services of implementing or not implementing such limits;

9. report to a future competent world radiocommunication conference the results of studies under *recommends that ITU-R* 3., 4. and 5. above, with a view to recommending whether or not it is appropriate to include general limits for out-of-band emissions in the Radio Regulations;

10. report the results of studies under *recommends that ITU-R* 6., 7. and 8. above to a competent world radiocommunication conference(s).

RECOMMENDATION 503 (Rev.WRC-97)

High-frequency broadcasting

The World Radiocommunication Conference (Geneva, 1997),

considering

a) the congestion in the HF broadcasting bands;

b) the extent of adjacent channel interference;

noting

the possibility of improving the situation by implementing pertinent ITU-R Recommendations;

recommends that administrations

1. pay special attention to the provisions for "out-of-band spectrum" contained in Recommendation ITU-R SM.328-9;

2. encourage, to the maximum extent possible, manufacturers to design and build HF broadcasting receivers that conform to Recommendation ITU-R SM.332-4 concerning the selectivity of receivers;

invites administrations

to take advantage, to the maximum extent practicable, of synchronized frequency transmitter operation, taking into account Recommendation ITU-R BS.702-1;

invites ITU-R

to carry out further studies in relation to the Recommendations mentioned above, taking into account the requirements of HF broadcasting, with a view to updating these three Recommendations whenever necessary.

RECOMMENDATION 515 (Rev.WRC-97)

Introduction of high-frequency broadcasting transmitters and receivers capable of operation with spectrum-efficient modulation techniques

The World Radiocommunication Conference (Geneva, 1997),

considering

a) Resolution **517 (Rev.WRC-97)** relating to the introduction of single-sideband (SSB) or other spectrum-efficient modulation techniques, including digital;

b) that industry should be encouraged to manufacture appropriate transmitters and receivers;

c) Appendix **S11** to the Radio Regulations relating to the SSB system specification for the HF bands allocated to the broadcasting service,

considering further

a) that the introduction of SSB or other spectrum-efficient modulation techniques can be accelerated by making the appropriate transmitting and receiving equipment being more widely available in good time;

b) that lead-time is necessary for manufacturers to produce appropriate equipment,

invites ITU-R

to complete its studies on receivers for spectrum-efficient modulation techniques,

recommends administrations

to bring to the notice of transmitter and receiver manufacturers the most recent results of relevant ITU-R studies on spectrum-efficient modulation techniques suitable for use at HF as well as the information referred to in *considering c)*,

instructs the Secretary-General

to transmit this Recommendation to the International Electrotechnical Commission (IEC).

RECOMMENDATION 522 (WRC-97)

Coordination of high-frequency broadcasting schedules in the bands allocated to the broadcasting service between 5 900 kHz and 26 100 kHz

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that Article **S12** of the Radio Regulations establishes the principles and the Procedure for use of the frequency bands allocated to the HF broadcasting service between 5 900 kHz and 26 100 kHz;

b) that the aforementioned principles stipulate, *inter alia*, that the Procedure should promote the development of a voluntary coordination process among administrations to resolve incompatibilities;

c) that the Procedure itself encourages administrations to coordinate their schedules with other administrations as far as possible prior to submission;

d) that the development of coordination among administrations with the assistance of the Bureau, when requested, would result in better use of the spectrum allocated to the HF broadcasting service between 5 900 kHz and 26 100 kHz,

recognizing

a) that the participation of broadcasting organizations in this coordination process would make the task of resolving incompatibilities easier;

b) that multilateral coordination of the use of the HF broadcasting bands is already practised on an informal basis in various regional coordination groups[1],

recommends administrations

to promote, as far as possible, regular coordination of their broadcasting schedules within appropriate regional coordination groups of administrations or broadcasting organizations in order to resolve or reduce incompatibilities, through bilateral or multilateral meetings or by correspondence (telephone, facsimile, email, etc.).

1 Not related to the ITU Regions.

RECOMMENDATION 622 (WRC-97)

Use of the frequency bands 2 025-2 110 MHz and 2 200-2 290 MHz by the space research, space operation, Earth exploration-satellite, fixed and mobile services

The World Radiocommunication Conference (Geneva, 1997),

considering

a) that the bands 2 025-2 110 MHz and 2 200-2 290 MHz are allocated on a primary basis to the space research, space operation, Earth exploration-satellite, fixed and mobile services;

b) that, in response to Resolutions from the 1992 Conference (WARC-92), studies have resulted in a number of ITU-R Recommendations, which, when adhered to by the services, will result in a stable, long-term sharing environment (Recommendations ITU-R SA.364, ITU-R SA.1019, ITU-R F.1098, ITU-R SA.1154, ITU-R F.1247, ITU-R F.1248, ITU-R SA.1273, ITU-R SA.1274 and ITU-R SA.1275);

c) that this Conference adopted No. **S5.391** of the Radio Regulations, which states that high-density mobile systems shall not be introduced in these frequency bands,

considering further

that enhancements in technology may enable the services mentioned in *considering a)* to minimize the total bandwidth requirement in these frequency bands,

noting

that WARC-92 considered that it is desirable to review the present and planned use of the frequency bands 2 025-2 110 MHz and 2 200-2 290 MHz, with the intent, where practicable, of satisfying some space mission requirements in bands above 20 GHz,

recognizing

that there are increasing requirements for emerging communication systems which need to be satisfied in the frequency range below 3 GHz,

recommends

that administrations planning to introduce new systems in the space research, space operation, earth exploration-satellite, fixed or mobile services in the bands 2 025-2 110 MHz and 2 200-2 290 MHz take into account the ITU-R Recommendations referred to in *considering b)* above when making assignments to these services, and implement enhancements in technology as early as practicable with a view to minimizing the total bandwidth required by systems of each service.