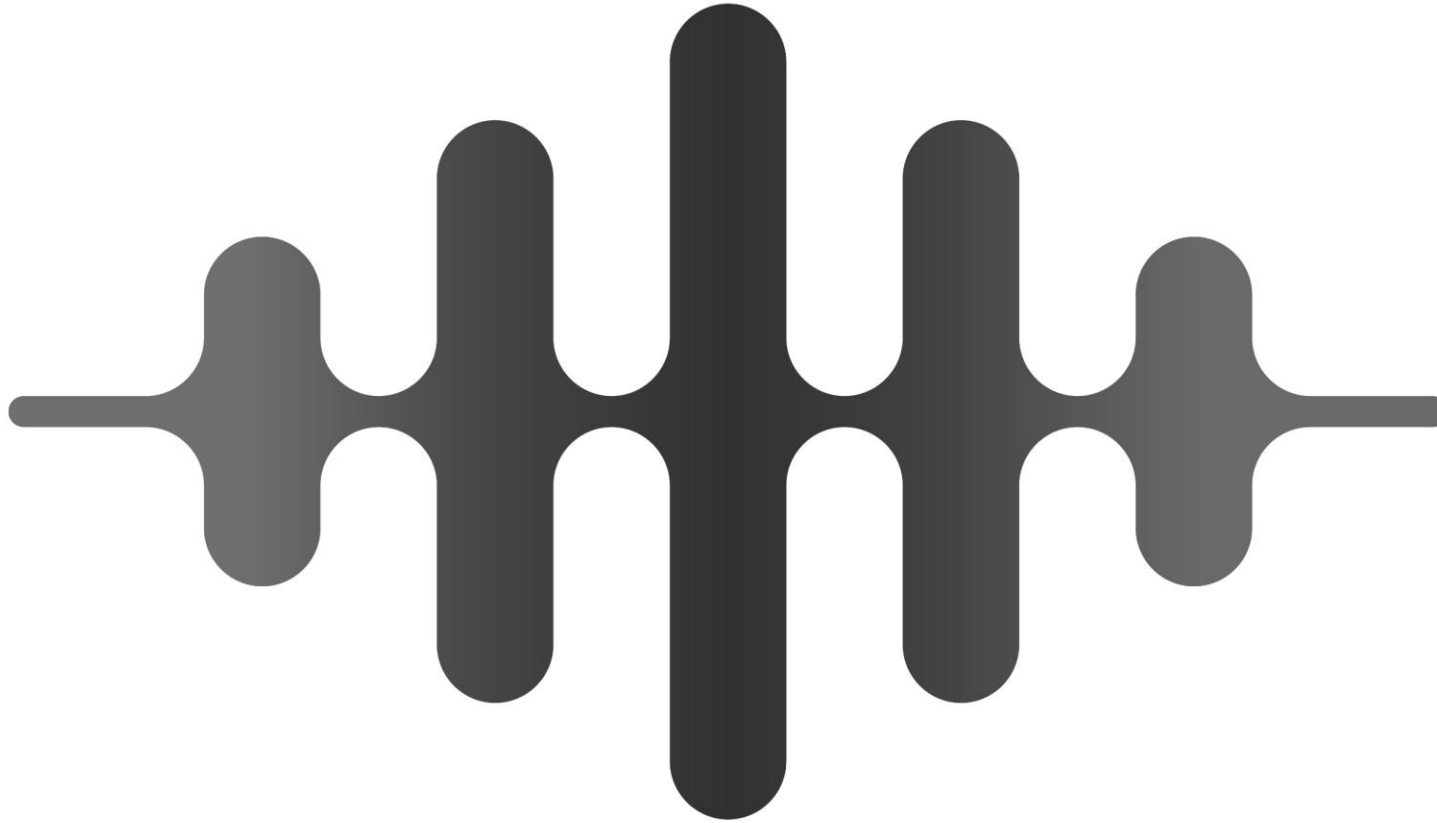
32ND ITU WORLD
RADIOCOMMUNICATION SEMINAR

ITUWRS GENEVA2026

7–11 December 2026
Geneva, Switzerland

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ITU World Radiocommunication Seminar

Frequency plans and coordination procedures for non-broadcasting services

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Head, Fixed and Mobile Services Division
Terrestrial Services Department
Radiocommunication Bureau

7-11 December 2026, Geneva, Switzerland

Scope and outline

Terrestrial services other than broadcasting

- Fixed service
- Mobile services (land, aeronautical and maritime mobile)
- Radionavigation services (aeronautical and maritime)
- Radiolocation, meteorological aids, standard frequency and time signal services

FXM

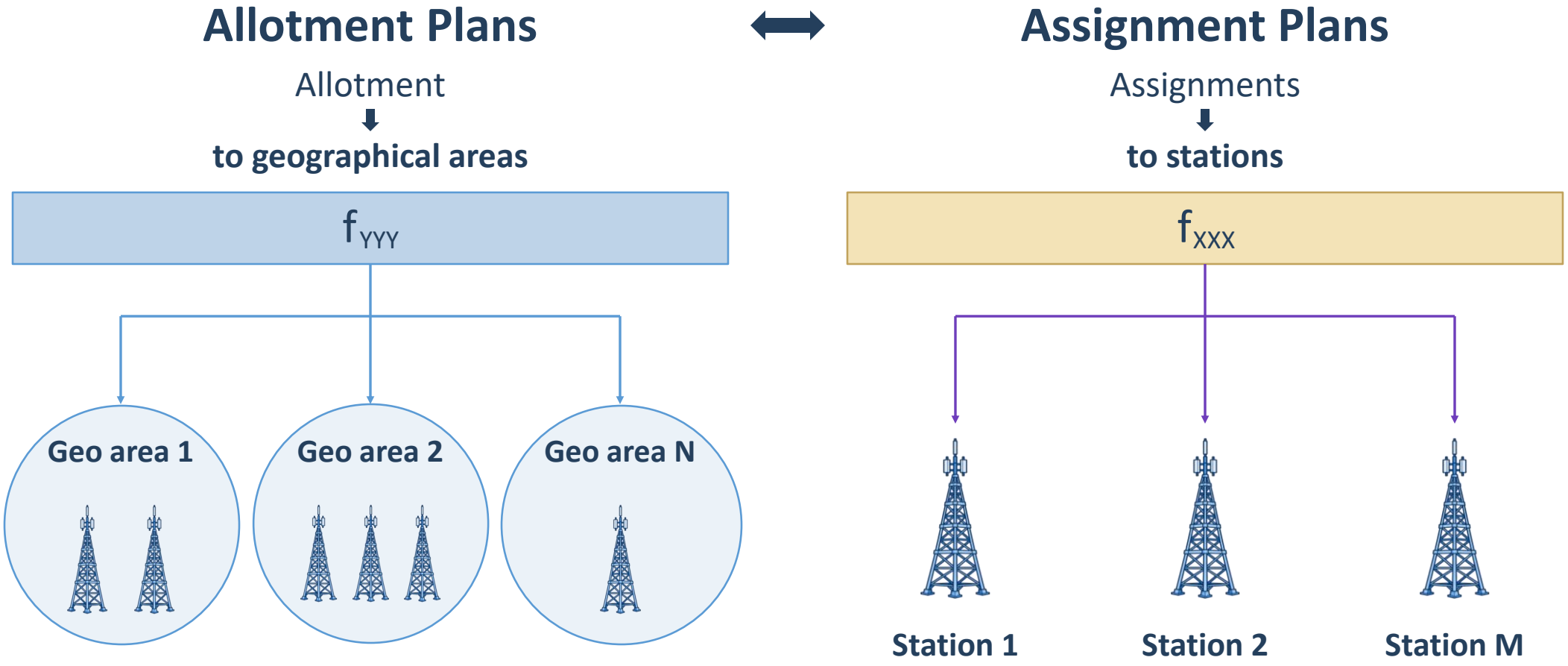
Presentation outline

Frequency allotment and assignment plans

Coordination of FXM assignments

Examination under RR Article 11

Frequency plans for FXM services



Frequency allotment plans for FXM services

Worldwide frequency allotment plans



AP25: maritime mobile service
4 000–27 500 kHz (HF)



AP26: aeronautical mobile (off-route) service
3 025–18 030 kHz (HF)



AP27: aeronautical mobile (route) service
2 850–22 000 kHz (HF)



Regional frequency allotment plan



GE85-MM-R1: national channels for Digital Selective Calling (DSC)
435–526.5 kHz and 1 606.5–2 160 kHz

Region 1

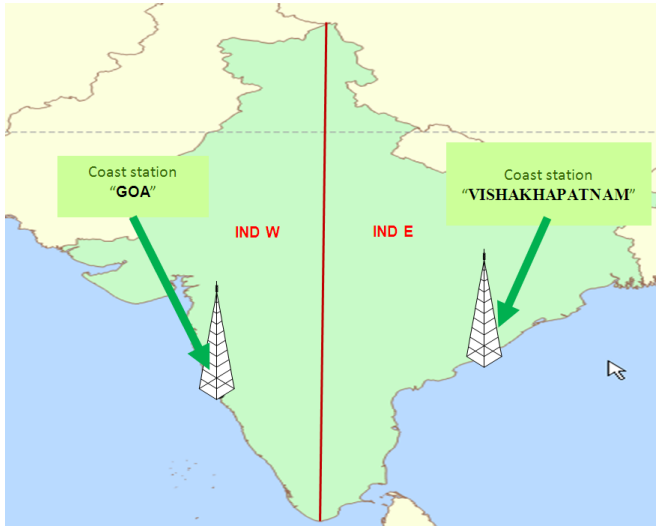


Maritime mobile allotment plan: RR Appendix 25



Worldwide maritime mobile plan: 4 000–27 500 kHz

– 240 channels and defined allotment areas. Channel bandwidth: 2.8 kHz. Emissions: J3E or J2D. Maximum peak envelope power: 10 kW.



19 792.4	ALS	
(19 791)	CHN	
	E	
(1813)	F	
	HWA	
	IND E	
	IND W	
	J	
	PTR	
	S	ADD
	TUR	
	USA E	
	USA SO	
	USA W	

India may assign channel 1813 to any coast station within its allotted areas, IND E and IND W.

Aeronautical mobile allotment plans: AP26 and AP27





AP26: worldwide aeronautical mobile off-route plan

3 025–18 030 kHz.

10 sub-bands, carrier frequencies and allotment areas.

Maximum bandwidth: 2.8 kHz. Emissions: J3E, A1A, A1B, F1B(A,H)2(A,B), (R,J)2(A,B,D), J(7,9)(B,D,X).

Mean effective radiated power: 1 kW (aeronautical stations), 50 W (aircraft stations).





AP27: worldwide aeronautical mobile route plan

2 850–22 000 kHz.

Carrier frequencies and MWARA, RDARA and VOLMET areas.

Emissions: J3E, H2B, J7B, J2D, J9X (A1A/A1B), F1A/F1B.
Separation: 3 kHz, in multiples of 1 kHz.

Peak envelope power (AP27/60), e.g. J3E, H2B, J7B, JXX:
6 kW (aeronautical stations)

400 W (aircraft stations)



AP26 and AP27: studies and regulatory updates

AP26: WRC-27 studies

WRC-27 agenda item 1.9 reviews AP26 for possible regulatory updates based on ITU-R studies. Resolution 411 (WRC-23) invites studies on:

New technologies. AM(OR)S in 3 025–18 030 kHz, including new emission classes and wideband systems.

Sharing and compatibility. Relevant technical and operational characteristics, plus sharing and compatibility with existing AM(OR)S systems and other primary services in the same or adjacent bands.

Protection of existing use. Potential AP26 changes without changing area allotments. Current narrowband use must remain unchanged and must not be affected or precluded.

AP27: WRC-23 updates

WRC-23 updated the technical basis of the HF AM(R)S frequency plan in RR Appendix 27.

Wideband aggregation. AP27/18A and AP/18A.1 allow aggregation of contiguous or non-contiguous channels for wideband communication, without changing the Plan for existing channels.

Digital emissions. AP27/58 and the table in AP27/60 now include telegraphy and data emission classes, such as J7D and J9B, to support digital modulation.

Clarifications. WRC-23 clarified the JXX emission class in AP27/57 and AP27/58, and 100% modulation in AP27/60.

Frequency assignment plans for FXM services

Regional frequency assignment plans



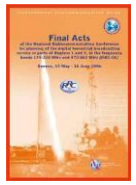
GE85-R1-MAR: Plan for maritime mobile service, MF bands



GE85-R1-AER: plan for aeronautical radionavigation service, MF bands



GE85-EMA: plan for maritime radiobeacons, European maritime area 283.5 - 315 kHz



GE06 List: frequency assignments for primary terrestrial services other than broadcasting in the GE06 planning area, in 174–230 MHz and 470–862 MHz.

Region 1



GE06 Planning Area



Aeronautical radionavigation plan: GE85-R1-AER

Scope

Plan for aeronautical radionavigation service in Region 1

Frequency bands: 415 – 435 kHz, 510 – 526.5 kHz

Also takes account of maritime mobile stations

Characteristics

34 channels with 1 kHz spacing (0.5 kHz exceptionally)

Classes of emission – A1A, A2A

Coordination procedure

Submit AP4 information to the BR for publication in BR IFIC.

Coordinate with affected administrations whose assignments conform to the Plan.

Inform the BR of the results (90 + 15 days).

Successful coordination enables recording in the Plan.









FXM frequency plans: summary

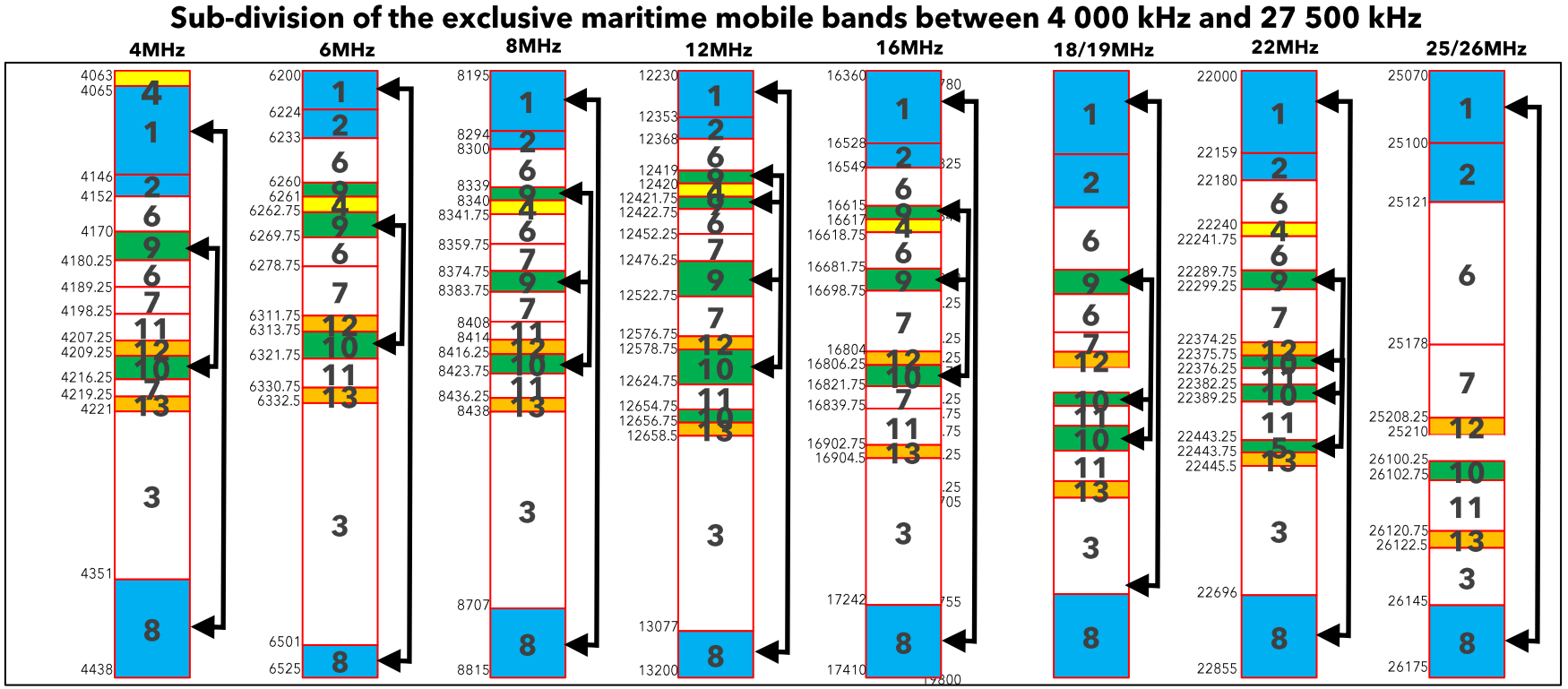


Plan name / type	Radiocommunication service	Planned bands	Planning area
AP 25 (Allotment)	Maritime mobile (Coast radiotelephone stations)	4000 - 27500 kHz	Worldwide
AP26 (Allotment)	Aeronautical Mobile (OR)	3025 - 18030 kHz	Worldwide
AP27 (Allotment)	Aeronautical Mobile (R)	2850 - 22000 kHz	Worldwide
GE85-MM-R1 (Allotment)	Maritime Mobile (DSC)	435 - 526.5 kHz 1 606.5 - 2 160 kHz	Region 1
GE85-R1-MAR (Assignment)	Maritime Mobile	415 - 495 kHz 505 - 526.5 kHz 1 606.5 - 1 625 kHz 1 635 - 1 800 kHz 2 045 - 2 160 kHz	Region 1
GE85-R1-AER (Assignment)	Aeronautical Radionavigation	415 - 435 kHz 505 - 526.5 kHz	Region 1
GE85-EMA (Assignment)	Maritime Radionavigation	283.5 - 315 kHz	European Maritime Area
GE06 List (Assignment)	e.g. Fixed / Mobile / Radionavigation etc.	174-230 MHz 470-862 MHz	In parts of Regions 1 and 3

HF maritime channelling: RR Appendix 17

- Maritime mobile service in 4 000–27 500 kHz.
- Exclusive bands at 4, 6, 8, 12, 16, 18/19, 22 and 25/26 MHz.
- Channels for ship stations (MS) and coast stations (FC).
- Arrangements support duplex radiotelephone equipment on ships.
- Paired and non-paired frequencies for narrow-band direct-printing (NBDP) telegraphy.
- WRC-12 designated bands for digital data transmission.
- WRC-19 designated six channels between 4 221 and 22 455.5 kHz for NAVDAT broadcasts of maritime safety and security information.
- Each sub-band plan maximizes use of the available spectrum.

HF maritime channelling: frequency-band overview



1 Radiotelephony (MS, duplex)
2 Radiotelephony (MS, FC, simplex)

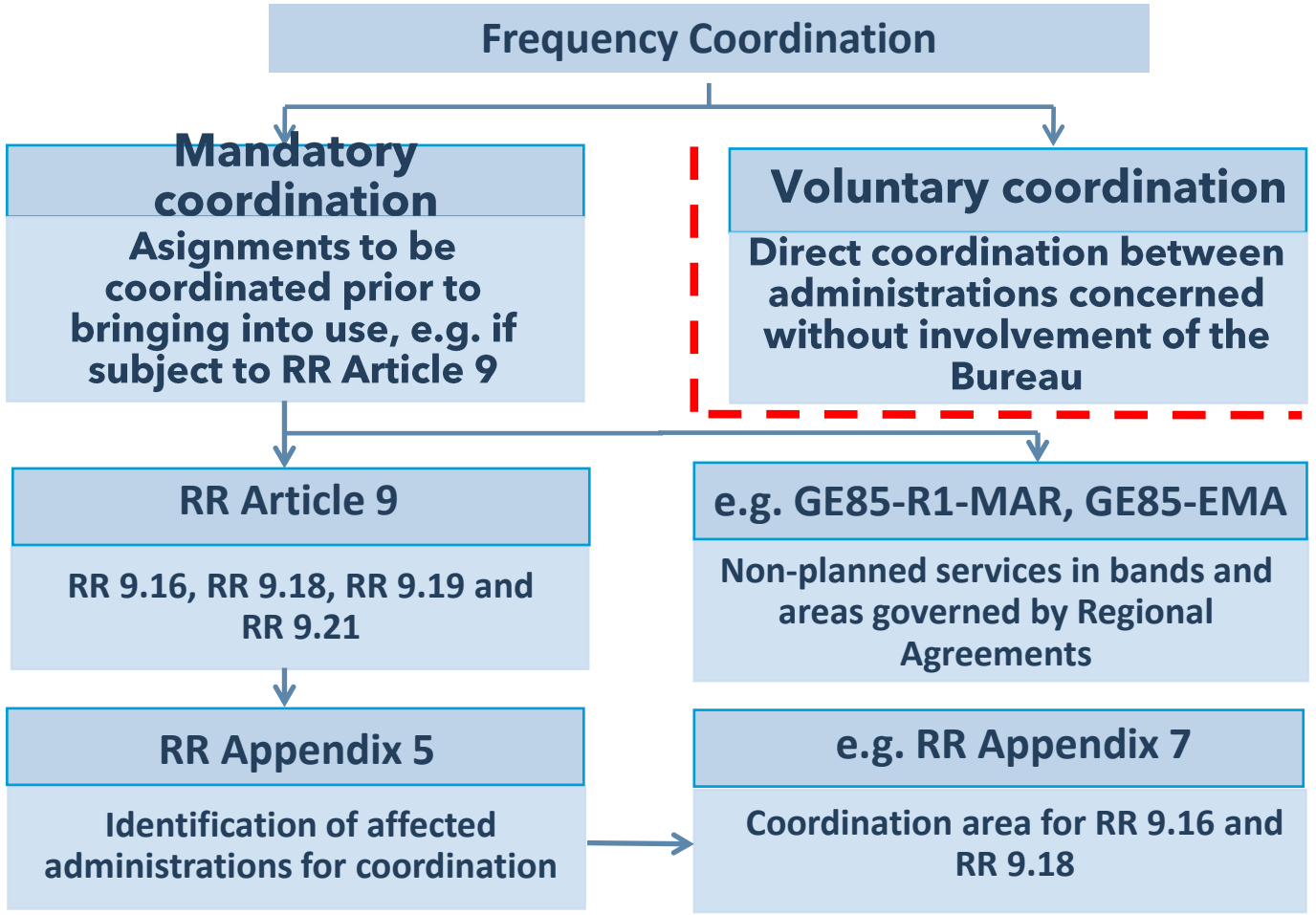
3 wide-band data transmission
4 oceanographic data transmission (OGD)
5 narrowband direct-printing (NBDP) (FC, non-paired)

6 data transmission (MS)
7 data transmission (MS, FC)
8 Radiotelephony (FC, duplex)

9 narrowband direct-printing (NBDP) (MS, paired and non-paired)
10 narrowband direct-printing (NBDP) (FC, paired and non-paired)

11 data transmission (FC)
12 digital selective calling (DSC) (MS)
13 digital selective calling (DSC) (FC)

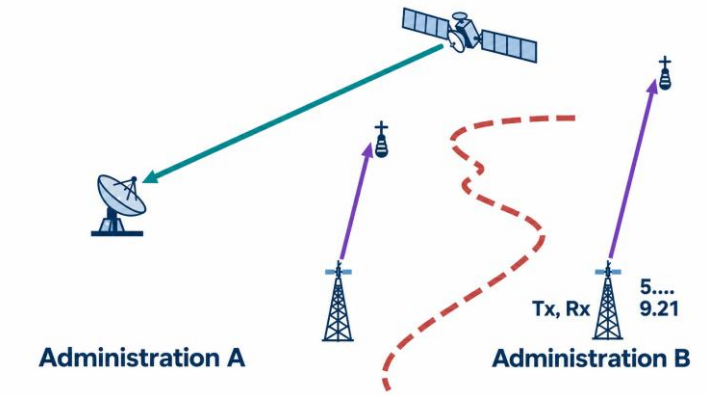
FXM coordination framework



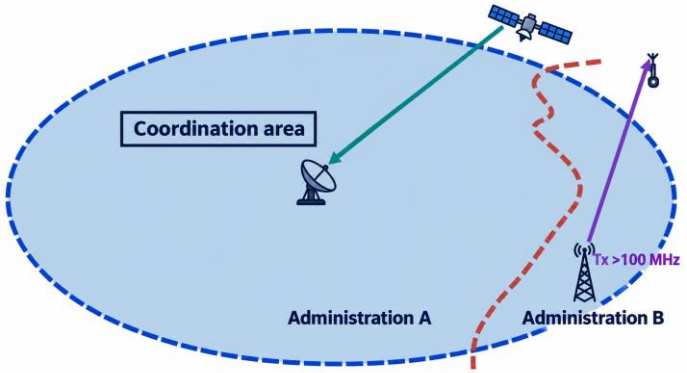
Mandatory coordination under RR Article 9

Mandatory coordination cases under RR Article 9
RR 9.16, RR 9.18,
RR 9.19 and RR 9.21

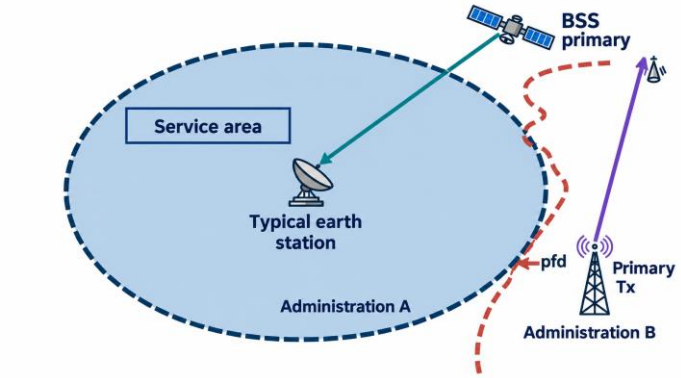
RR 9.21



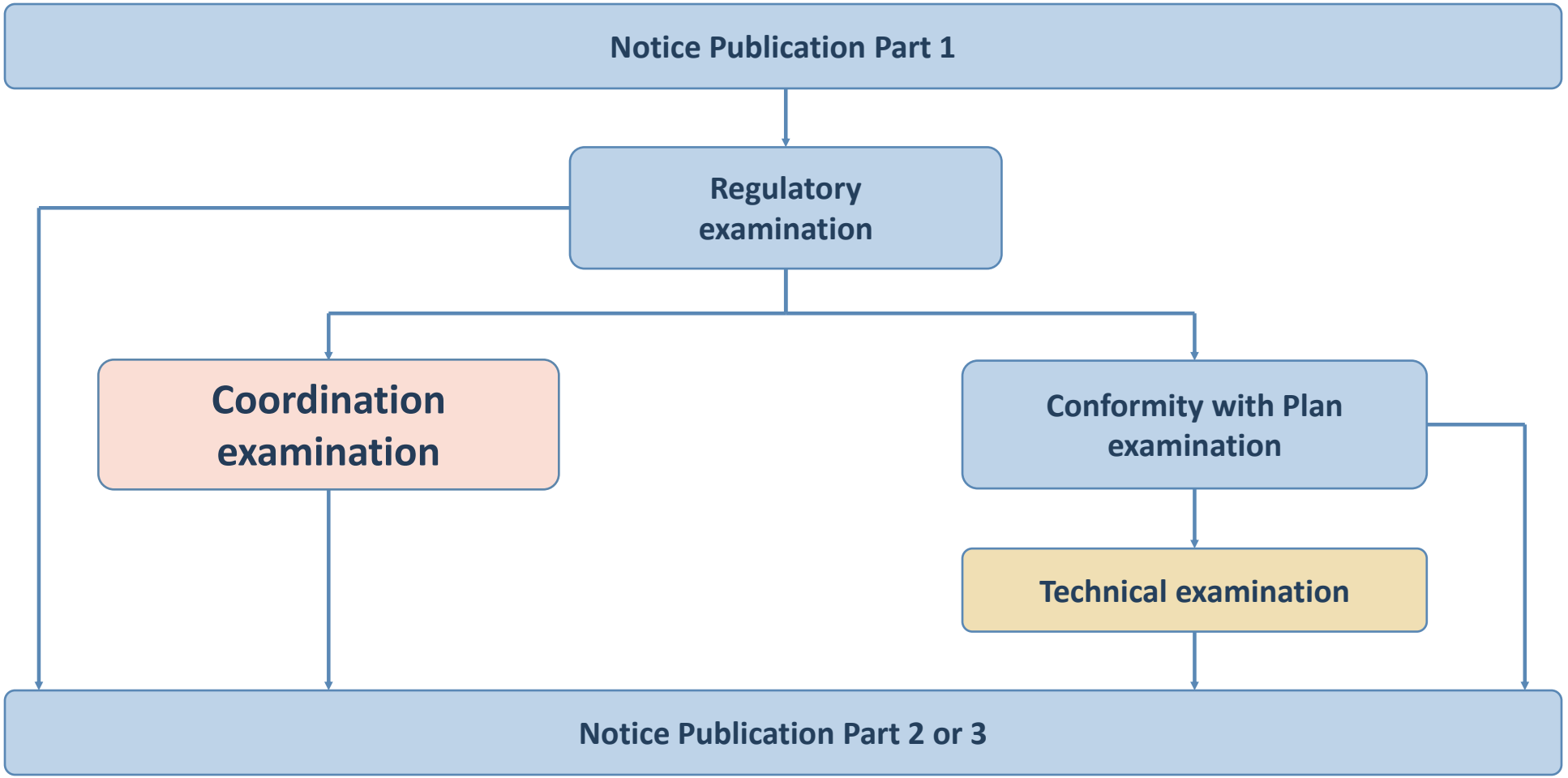
RR 9.16/RR 9.18



RR 9.19



FXM assignment examination under RR Article 11



Regulatory examination under RR 11.31

Table of frequency allocations, including footnotes:

- Notified band lies within the band allocated to the service
- Receiving point lies in a country where the allocation exists
- Category of allocation: primary or secondary
- Successful application of RR 9.21 (RR 11.31.1)
  - ✓ Mobile allocations and/or IMT identifications subject to RR 9.21: 470–694/698 MHz, 694–790 MHz (Region 1), 1 427–1 518 MHz, 3 300–3 400 MHz, 3 400–3 700 MHz and 4 800–4 990 MHz
  - ✓ RoP (e.g. RR 5.316B, RR 5.341A, Section B6 etc.)
  - ✓ CR/391 and CR/467: Nature of Service IM for IMT stations

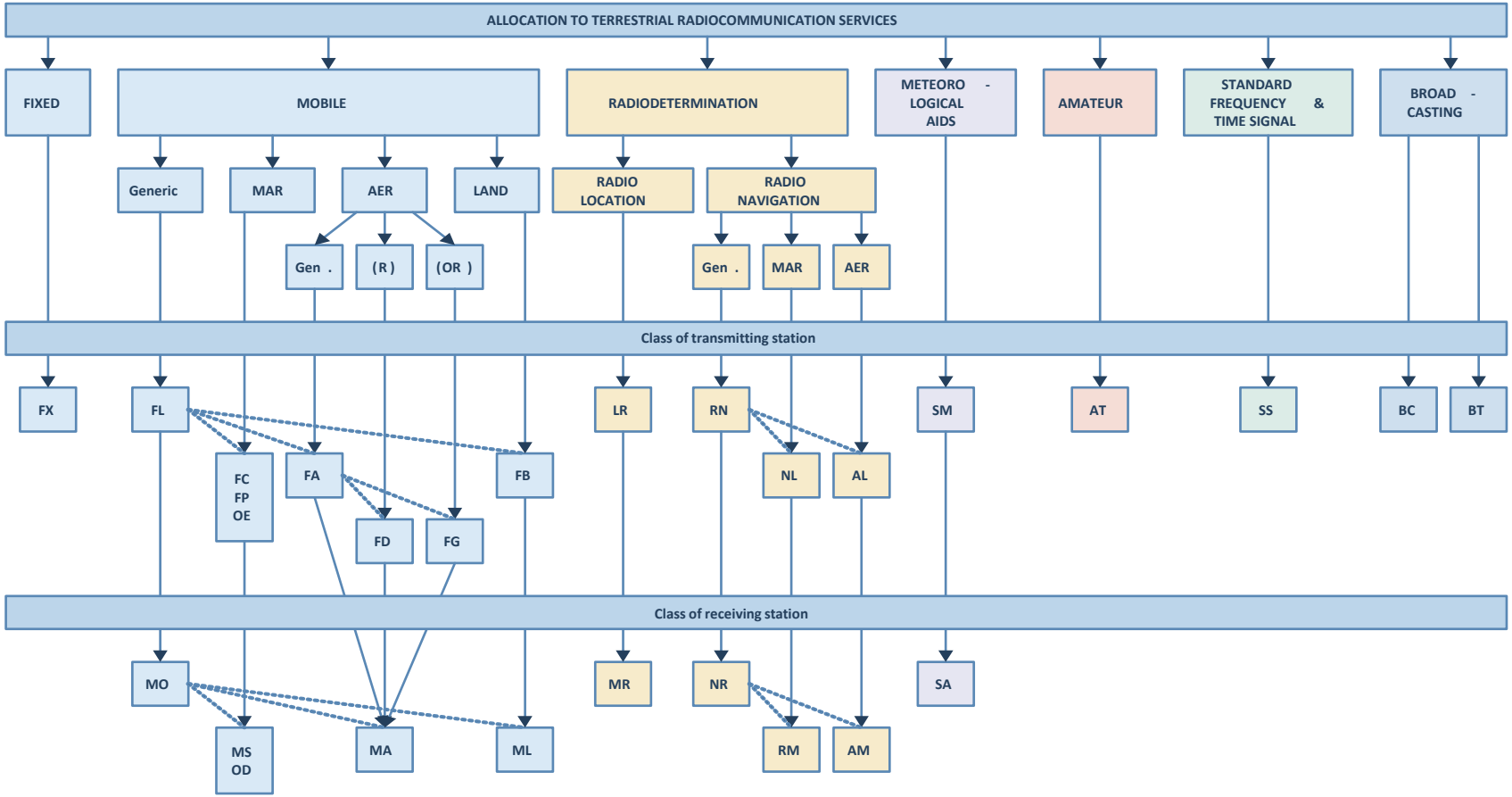
    Enables examination of the conditions associated with IMT

Other RR provisions:

- Power limits RR 21.3 – RR 21.5A
- Service-specific requirements, including emission classes, channelling and HF maritime mobile power limits

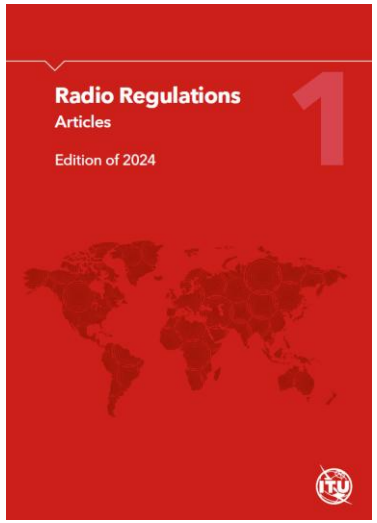
Regulatory examination: station classes

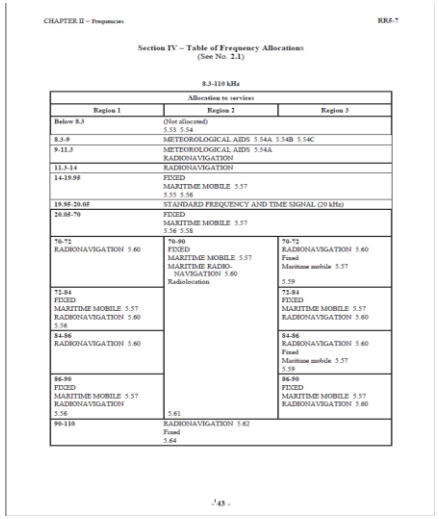
Relation between radio services and classes of stations



Regulatory examination: permitted station classes

Allocation to services		
Region 1	**Region 1**	**Region 1**
24 000-24 450	FIXED LAND MOBILE	



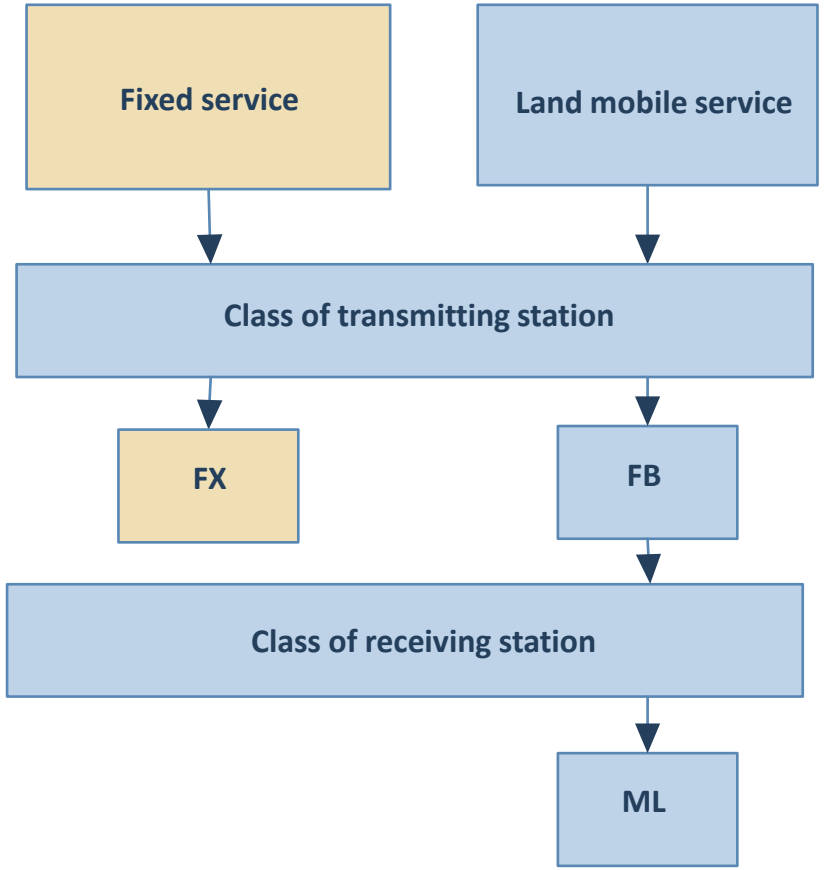


Section IV – Table of Frequency Allocations
(See No. 2.1)

8.3-110 kHz

Allocation to services		
Region 1	Region 2	Region 3
Below 8.3	(Not allocated) 5.53 5.54	
8.3-9	METEOROLOGICAL AIDS 5.54A 5.54B 5.54C	
9-11.3	METEOROLOGICAL AIDS 5.54A RADIONAVIGATION	
11.3-14	RADIONAVIGATION	
14-19.95	FIXED MARITIME MOBILE 5.57 5.55 5.56	
19.95-20.05	STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)	
20.05-70	FIXED MARITIME MOBILE 5.57 5.56 5.58	
70-72 RADIONAVIGATION 5.60	70-90 FIXED MARITIME MOBILE 5.57 MARITIME RADIO-NAVIGATION 5.60 Radiolocation	70-72 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57 5.59
72-84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60 5.56		72-84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60
84-86 RADIONAVIGATION 5.60		84-86 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57 5.59
86-90 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.56	5.61	86-90 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60
90-110	RADIONAVIGATION 5.62 Fixed 5.64	

Permitted classes of station



Regulatory examination: bandwidth conformity

Allocation to services			
Region 1		**Region 2**	**Region 3**
322-328.6 MHz	FIXED MOBILE RADIO ASTRONOMY 5.149		
328.6-335.4 MHz	AERONAUTICAL RADIONAVIGATION 5.259		

Example for FIXED service with Favourable finding

Class of station FX

Assigned frequency: 327.0 MHz
/ f_{min}: 325.5 MHz/ f_{max}: 328.5 MHz

Bandwidth 3 MHz

Example for FIXED service with Unfavourable finding

Class of station FX

Assigned frequency 328.0 MHz
/ f_{min}: 326.5 MHz/ f_{max}: 329.5 MHz

Bandwidth 3 MHz

Reason for unfavourable finding: bandwidth overlaps with non-allocated band

Regulatory examination: uplink power limits

RR Article 21:
uplink protection and power limits for fixed and mobile transmitters

RR 21.3: e.i.r.p. ≤ 55 dBW

RR 21.4: GSO protection, e.i.r.p.

- ≤ 47 dBW within 0.5° of GSO
- ≤ 47–55 dBW
- between 0.5° and 1.50° of GSO

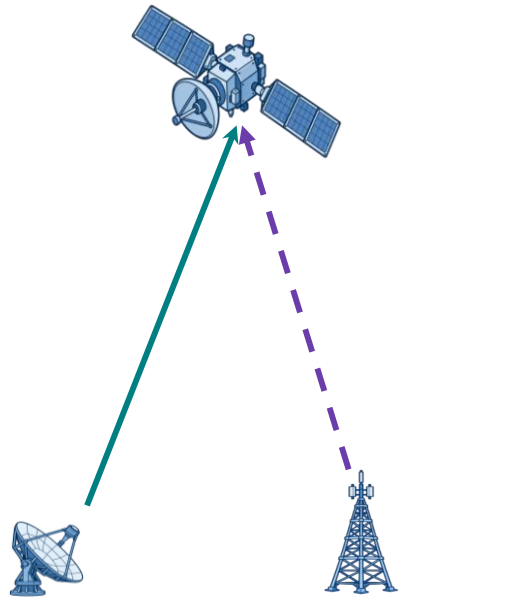
RR 21.5: power to antenna

- ≤ 13 dBW in 1–10 GHz bands
- ≤ 10 dBW above 10 GHz

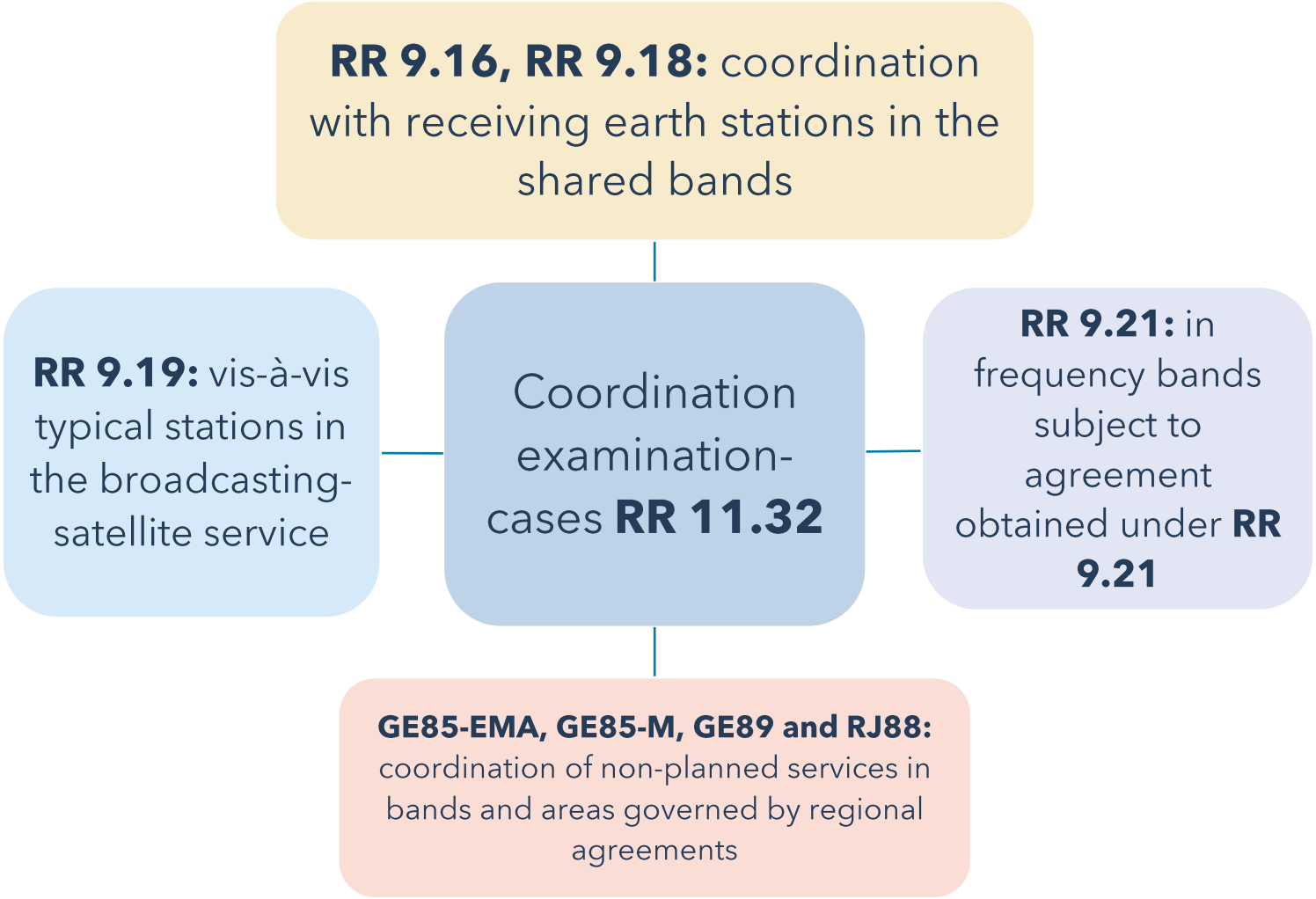
RR 21.5A: power to antenna

- ≤ −3 dBW for FS in 18.6–18.8 GHz

RR 21.3–21.5A apply in Table 21-2 bands



Coordination examination under RR 11.32



Coordination of terrestrial and space services

Shared frequency allocations

– More than 60 bands above 100 MHz allocate equal rights to terrestrial and space services.

Downlink protection through coordination

– Coordination protects receiving earth stations and BSS typical receiving earth stations from terrestrial transmitters.

7 250-8 500 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
8 025-8 175	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	

Downlink protection and coordination

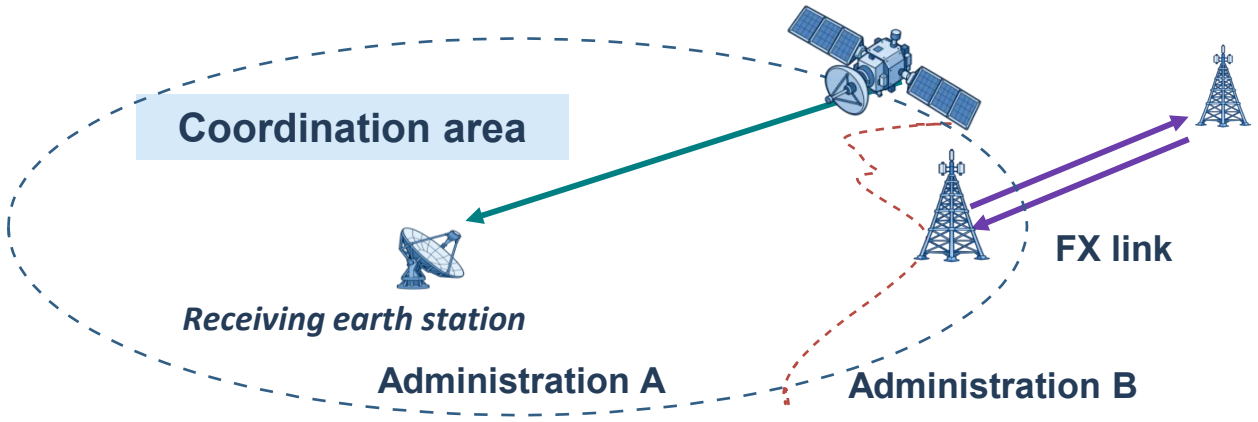
Protection of space services in downlink

Specific receiving earth stations

Coordinate terrestrial transmitters within the earth station's coordination area (RR 9.16 and RR 9.18).

BSS typical receiving earth stations:

coordinate terrestrial transmitters with the BSS service area (RR 9.19).



Coordination is necessary when frequencies overlap and the terrestrial transmitter lies within the earth station's coordination area.

Conformity with frequency allotment plans

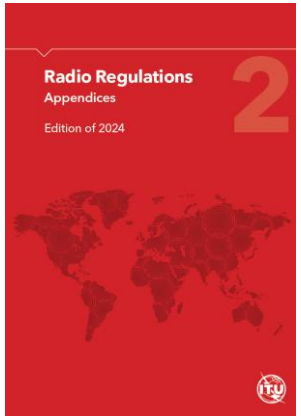
Worldwide allotment plans for maritime mobile and aeronautical mobile services (AP25, AP26 and AP27)

Notified frequency is in allotted channel listed in the Plan

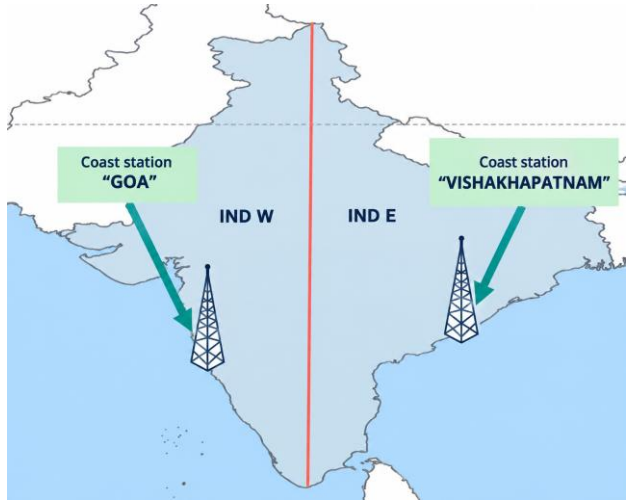
Notified geographical area corresponds to a Plan allotment

Receiving area is within the allotment area

AP25



19 792.4	ALS	
(19 791)	CHN	
	E	
(1813)	F	
	HWA	
	IND E	
	IND W	
	J	
	PTR	
	S	ADD
	TUR	
	USA E	
	USA SO	
	USA W	



Technical examination under AP26 and AP27

AP26 and AP27: applies when a notice meets the allotment plan's technical principles but does not conform to the allotment plan.

AP26: examine the notice against the allotments in Part III of AP26 (RR 11.39C).

AP27: check that the notice provides the protection specified in AP27 to Plan allotments and to assignments already recorded in the Master Register with a favourable finding (RR 11.39A).

RR provisions for use of assignments to terrestrial service stations

Article 4: general rules for assignment and use of frequencies

Article 5: frequency allocations - assignments should be in conformity with Table of Frequency Allocations and footnotes

Article 9: coordination procedures - assignments should be coordinated prior to bringing into use, if subject to Article **9**

Appendix 5: identification of affected administrations for coordination
Appendix 7: determination of coordination area (for RR**9.16**, RR**9.18**)

Article 11: notification and recording of assignments

Appendix 4: characteristics of assignments to be notified for recording in the Master Register or used in coordination

Article 8: status of assignments recorded in the Master Register

Article 21: sharing between terrestrial and space services – power limits on transmitters in fixed and mobile services

Other provisions: Art. **24** (FS), Art. **43** (AMS), Art. **51**, **52** (MMS), AP**25** (MMS), AP**26** (AM(OR)S), AP**27** (AM(R)S), etc.

Thank you!

ITU – Radiocommunication Bureau

Questions to brmail@itu.int

LMS Frequency bands below 1 GHz subject to RR9.21

Frequency, service, area and coordination criteria

RR No.	Freq. band	Service	Coordination criteria	Area *
5.292	470-512 MHz	MOBILE	RoP B6	ARG, URG, VEN
5.293	470-512 MHz 614-698 MHz	MOBILE		ARG, BAH, BRB, CAN, CHL, PAQ, CUB, EQA, GUY, JMC, MEX, PNR, USA, ALS, HWA, JON, MDW, PTR, VIR BAH, BRB, CAN, CHL, PAQ, CUB, GUY, JMC, MEX, PNR, USA, ALS, HWA, JON, MDW, PTR, VIR
5.295	470-608 MHz	LAND MOBILE (IMT)	RoP B6	BAH, BRB, CAN, MEX, USA, ALS, HWA, JON, MDW, PTR, VIR
5.295A	470-694 MHz	Mobile except aero.	RoP B6	ALB, AND, AUT, BEL, BIH, BUL, CVA, CYP, CZE, D, DNK, FRO, EST, F, CRO, MYT, REU, FIN, G, ASC, GIB, SHN, TRC, GEO, GRC, HNG, HOL, HRV, IRL, ISL, LIE, LTU, LUX, LVA, MCO, MDA, MKD, MLT, MNE, NOR, BVT, POL, POR, AZR, MDR, ROU, S, SMR, SRB, SUI, SVK, TUR, UKR, UZB
5.296A	470-698 MHz / 610-698 MHz	LAND MOBILE (IMT)	RoP B6	FSM, SLM, TUV, VUT / BGD, MLD, LAO, NZL, CKH, NIU, TKL, VTN
5.297	512-608 MHz	MOBILE	RoP B6	CAN, CTR, CUB, BAH, BRB, SLV, GTM, GUY, JMC, MEX, USA, ALS, HWA, JON, MDW, PTR, VIR

* The areas highlighted with green are in Region 2 and those highlighted with blue are in Region 3 and others are in Region 1.

LMS Frequency bands below 1 GHz subject to RR9.21

Frequency, service, area and coordination criteria

RR No.	Freq. band	Service	Coordination criteria	Area *
5.307A	614-694 MHz	MOBILE except aero.	RoP B6	ARS, BHR, EGY, IRQ, JOR, KWT. OMA, PSE, QAT, SYR, UAE
5.308	614-698 MHz	MOBILE	RoP B6	BLZ, CLM, GTM, SLV
5.308A	614-698 MHz	MOBILE (IMT)	RoP B6	BAH, BLZ, BRB, CAN, CLM, GTM, JMC, MEX, SLV, USA, ALS, HWA, JON, MDW, PTR, VIR
5.312A	694-790 MHz	MOBILE except aero.	RoP 5.312A Res. **760 (Rev.WRC-23)**	Region 1 countries (ALB, ARM, AUT, AZE, BIH, BLR, BUL, CZE, D, DNK, EST, FIN, GEO, GRC, HNG, HRV, I, IRQ, KAZ, KGZ, LTU, LVA, MKD, MDA, MNE, MNG, NOR, POL, ROU, RUS, S, SRB, SVK, SYR, TJK, TKM, TUR, UKR, UZB)
5.316B	790-862 MHz	MOBILE except aero.	RoP 5.316B Res. **749 (Rev.WRC-23)**	
5.326	903-905 MHz	MOBILE except aero.	RoP B6	CHL, PAQ

* The areas highlighted with green are in Region 2 and those highlighted with blue are in Region 3 and others are in Region 1.

LMS Frequency bands between 1-4 GHz subject to RR9.21

Frequency, service, area and coordination criteria

RR No.	Freq. band	Service	Coordination criteria	Area *
5.341A	1429-1452 MHz 1492-1518 MHz	LAND MOBILE (IMT)	RoP 5.341A, RoP B6	Region 1 countries (ALB, ARM, AUT, AZE, BIH, BLR, BUL, CZE, D, DNK, EST, FIN, GEO, GRC, HNG, HRV, I, IRQ, KAZ, KGZ, LTU, LVA, MDA, MKD, MNE, MNG, NOR, POL, ROU, RUS, S, SRB, SVK, SVN, SYR, TJK, TKM, TUR, UKR, UZB)
5.341C	1429-1452 MHz 1492-1518 MHz	LAND MOBILE (IMT)	RoP B6	Region 3
5.346	1452-1492 MHz	LAND MOBILE (IMT)	RoP 5.346 RoP B6	Region 1 countries (IRQ)
5.346A	1452-1492 MHz	LAND MOBILE (IMT)	RoP B6	Region 3
5.429F	3300-3400 MHz	LAND MOBILE (IMT)	RoP B6	CBG, IND, INS, LAO, PAK, PHL*, SNG, VTN (* No allocation to the LMS)
5.430A	3400-3600 MHz	MOBILE except aero.	RoP B6	Region 1
5.431A	3400-3500 MHz	MOBILE except aero.	RoP B6	Region 2
5.431B	3400-3600 MHz	LAND MOBILE (IMT)	RoP B6	Region 2
5.432B	3400-3500 MHz	MOBILE except aero.	RoP B6	AUS, CKH, HMD, ICO, NFK, BGD, BRU, CHN, HKG, MAC, IND, INS, IRN, MLA, NZL, PHL, SNG, THA, AMS, KER, NCL, OCE, WAL, NIU, TKL
5.434A	3600-3800 MHz	MOBILE except aero.	RoP B6	Region 1

* The areas highlighted with green are in Region 2 and those highlighted with blue are in Region 3 and others are in Region 1.

LMS Frequency bands above 4 GHz subject to RR9.21

Frequency, service, area and coordination criteria

RR No.	Freq. band	Service	Coordination criteria	Area *
5.441B	4800-4825 MHz 4825-4835 MHz 4835-4950 MHz 4950-4990 MHz	MOBILE (IMT) MOBILE except aero. (IMT) MOBILE (IMT) MOBILE except aero. (IMT)	Res. **223 (Rev. WRC-23)**	AFS, MRN, AGL, ARG, ARM, AZE, B, BDI, BEN, BFA, BOT, CBG, CHL, PAQ, CHN, HKG, MAC, CLM, CME, COD, COG, CPV, CTI, DJI, GAB, GHA, GUI, IRN, IRQ, KAZ, KGZ, KRE, LAO, LBR, LSO, MDG, MLI, MNG, MWI, NGR, NMB, RUS, SSD, SWZ, TCD, TGO, UGA, UZB, VTN, ZMB, ZWE
5.457F	6425-7125 MHz	LAND MOBILE (IMT)	RoP B6	B, MEX
5.480A	10-10.5 GHz	LAND MOBILE (IMT)	RoP B6	MEX
5.553A	45.5-47 GHz	LAND MOBILE (IMT)	RoP B6	AFS, MRN, AGL, ALG, B, BEN, BFA, BHR, BLR, BOT, CPV, CTI, DJI, EGY, EST, HRV, GAB, GHA, GMB, GNB, GRC, GUI, HNG, IRN, IRQ, JOR, KOR, KWT, LBR, LSO, LTU, LVA, MAU, ROD, MDG, MLI, MOZ, MRC, AOE, MTN, MWI, NGR, NIG, NMB, OMA, QAT, S, SDN, SEN, SEY, SOM, SRL, SVN, SWZ, TGO, TUN, TZA, UAE, ZMB, ZWE

* The areas highlighted with green are in Region 2 and those highlighted with blue are in Region 3 and others are in Region 1.

HIBS Frequency bands subject to RR9.21

Frequency, service, area and coordination criteria

RR No.	Freq. Band **	Service	Coordination criteria	Area *
5.312B	694/698-960 MHz	LAND MOBILE (HIBS)	RoP 5.312B	Region 1 / Region 2
5.314A	698/790-960 MHz	LAND MOBILE (HIBS)	RoP 5.314A	AUS, CHR, HMD, ICO, NFK, PNG, TON, VNU / MLD, FSM
	703-733 MHz, 758-788 MHz, 890-915 MHz and 935-960 MHz			CHN, HKG, MAC, IND, INS, J, KOR, MLA, PHL, THA

* The areas highlighted with green are in Region 2 and those highlighted with blue are in Region 3 and others are in Region 1.