INTERNATIONAL TELECOMMUNICATION UNION

ITU-T   M.100

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

MAINTENANCE :
INTRODUCTION AND GENERAL PRINCIPLES

SERVICE CIRCUITS

ITU-T Recommendation M.100

(Extract from the *Blue Book*)

NOTES

1   ITU-T Recommendation M.100 was published in Fascicle IV.1 of the *Blue Book*. This file is an extract from the *Blue Book.* While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

2   In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Recommendation M.100

SERVICE CIRCUITS

To facilitate the general maintenance of the international telephone network, *service circuits* should be set up as may be necessary between relevant maintenance units taking part in the international service.

For the purposes of this Recommendation, a distinction is made between the following types of service circuit:

– **Direct service circuit**: a telephone or teleprinter (teletypewriter) service circuit serving only two stations and linking them directly.

Note – It will also be necessary to consider the communications required by technical staff for setting up and maintaining very long circuits routed over a number of major systems in tandem, e.g. London-Singapore circuits. These may require service circuits to be interconnected.

– **Omnibus service circuit** (see Figure 1/M.100 below): a telephone or teleprinter (teletypewriter) service circuit serving more than two stations connected in series, any or all of which may make connection to the service circuit simultaneously.

– **Multiterminal service circuit** (see Figure 2/M.100 below): a telephone or teleprinter (teletypewriter) service circuit serving more than two stations and having at least one branching point. On each *branch* of this circuit a certain number of stations can be connected in series. Every station served can enter the circuit individually.

Note – Attention is drawn to the possible use of selective signalling on omnibus and multiterminal service circuits and to the problems that may arise in achieving the necessary stability on such circuits.

It is recommended that for the maintenance of international circuits:

1) all attended stations should be connected direct to the public telephone network;

2) the terminal stations of an international system should be provided with a direct telephone service circuit;

3) terminal and intermediate stations on an international system should be provided with an omnibus telephone service circuit;

4) where the provision of direct teleprinter (teletypewriter) service circuits is impracticable or uneconomical, important repeater stations on international routes should be provided with international telex facilities;

The equipment of the telegraph local end used on service telegraph circuits must be capable of transmitting and receiving signals conforming to International Telegraph Alphabet No. 2 and must be in accordance with the provisions of CCITT Recommendations;

5) maintenance staff responsible for international circuits should have authority to make priority calls in the international telephone service [1];

TO——▶—— send
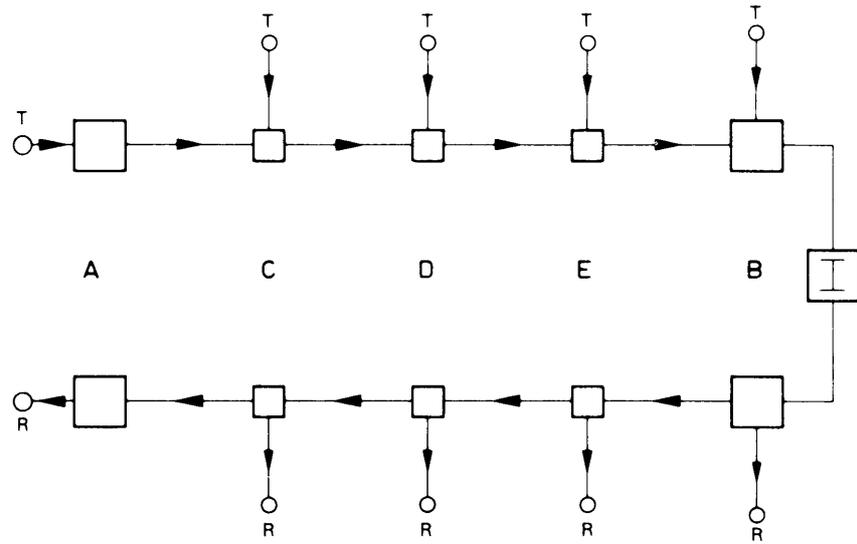
RO——◀—— receive

A B   terminal international centres or terminal repeater stations

C D E   intermediate international centres or intermediate repeater stations

$\boxed{\text{I}}$ attenuator looping the two directions of transmission

FIGURE 1/M.100

Example of an omnibus service circuit

FIGURE 2/M.100

Multiterminal service circuit

T o—■— send

R o—◄— receive

A B C D terminal international centres or terminal repeater stations

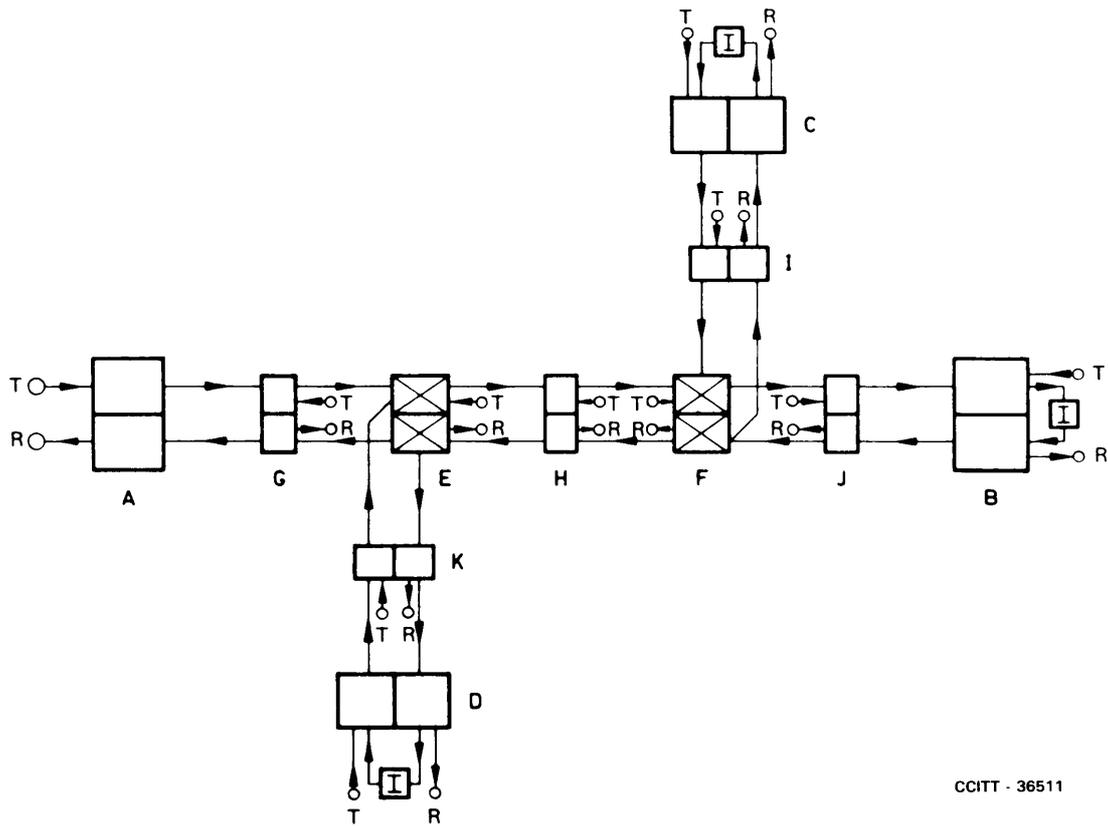**E F** international centres (or repeater stations) with branching facilities

G H I J K intermediate international centres or intermediate repeater stations

[I] attenuator looping the two directions of transmission

6) all service circuits should in general conform to the Recommendations of the CCITT in respect of their quality and maintenance. However, service circuits may have a restricted quality which must nevertheless be such as to provide efficient communication when maintenance personnel have to use languages other than their mother tongue;

7) in the event of a major interruption involving service circuits, these should be accorded priority in restoration;

8) the terminal stations of a long international submarine cable system should be provided with a direct teleprinter (teletypewriter) service circuit;

9) terminal and intermediate stations on a long international submarine cable system should be provided with an omnibus teleprinter (teletypewriter) service circuit.

The CCIR has issued Recommendation 400-2 concerning service circuits for radio-relay links. (For the convenience of readers, this Recommendation is reproduced below. CCIR Report 444 [2] also applies.)

CCIR RECOMMENDATION 400-2[*]

SERVICE CHANNELS TO BE PROVIDED FOR THE OPERATION AND MAINTENANCE OF RADIO-RELAY SYSTEMS

(Question 4/9, Geneva, 1982)

(1956 – 1959 – 1963 – 1966 – 1970)

The CCIR,

CONSIDERING

a)   that service channels are required for the maintenance, supervision and control of radio-relay systems;

b)   that if, for any reason, the radio-relay system itself fails to function, communication between various stations along the route, and from those stations to other points is likely to assume special importance;

c)   that agreement is desirable on the number and function of the service channels to facilitate the planning of radio-relay systems;

d)   that service channels will be used to provide:

–   omnibus voice circuits,

–   express voice circuits,

–   supervisory circuits,

–   control and operational circuits;

e)   that service channels will not be connected to the public telephone network,

UNANIMOUSLY RECOMMENDS

that, on international radio-relay systems:

1.   all staffed stations should be connected directly to the public telephone network;

2.   when a radio-relay link is extended by means of short cable sections, and these cable sections and the radio-relay link taken together constitute a regulated line section, the terminal stations of the radio-relay link itself should have speaker circuits to the stations at the ends of the regulated line section;

3.   a telephone service channel (omnibus voice circuit) should be set up to connect together all the stations on the system, whether staffed or not;

4.   a second telephone service channel (express voice circuit) should be provided for direct telephonic communication between the staffed stations receiving supervisory signals;

5.   provisions for the transmission of supervisory and control signals should be subject to agreement between the Administrations concerned;

6.   the telephone service channels should possess, whenever possible, the characteristics (excluding noise power) recommended by the CCITT for international telephone circuits and, in particular, should be able to transmit the frequency band 300 to 3400 Hz;

7.   all telephone service channels (including those used for supervisory and control circuits) up to a length of 280 km should, whenever possible, not exceed a mean noise power in any hour of 20 000 pW0p psophometrically weighted, at a point of zero relative level.

Note – Service channels may be provided over an auxiliary radio-relay system, over the main radio-relay system, or by other unrelated means, either on a primary or stand-by basis. In the case of express voice circuits, the use of regular multiplex channels within the telephony baseband is acceptable, where this is possible.

References

[1]   CCITT, *Instructions for the International Telephone Service,* Articles 46 to 49, ITU, Geneva, 1985.
[2]   CCIR Report *Service channels for analogue radio-relay systems*, Vol. IX, Report 444, ITU, Geneva, 1986.

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[*]   This Recommendation applies to radio-relay systems which will transmit at least 60 telephone channels or a television signal and comprise two staffed terminal stations, in which the signals are demodulated to baseband, and any number of unstaffed intermediate stations, This Recommendation applies, where appropriate, to trans-horizon radio-relay systems.