



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

M.900

**MAINTENANCE: INTERNATIONAL LEASED GROUP
AND SUPERGROUP LINKS**

**USE OF LEASED GROUP AND
SUPERGROUP LINKS FOR
WIDE - SPECTRUM SIGNAL TRANSMISSION
(DATA, FACSIMILE, ETC.)**

ITU-T Recommendation M.900

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation M.900 was published in Fascicle IV.2 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.900

USE OF LEASED GROUP AND SUPERGROUP LINKS FOR WIDE - SPECTRUM SIGNAL TRANSMISSION (DATA, FACSIMILE, ETC.)

NOMENCLATURE AND COMPOSITION

This Recommendation assumes that the constitution is such that the terminal national sections are provided by means of plant which is suitable for the transmission of wide-spectrum signals in the frequency band 60-108 kHz and 312-552 kHz respectively and the link is defined as given in § 1.1 below (see also Recommendations H.14 [1] and H.15 [2]).

In the case where the terminal national section uses plant not specifically destined for operation in the basic group or supergroup band, it will be necessary to provide the terminal national centre concerned with equipment to translate such a band of frequencies, i.e. the data base band signals, into the 60-108 kHz or 312-552 kHz band and vice versa.

Where this is done, the link should be regarded as being between defined access points at the two terminal national centres at points as close as possible to such translating equipment.

1 Nomenclature

1.1 international leased group or supergroup link

The whole of the transmission path – as defined in Recommendation M.300 [3] – provided between defined test access points at an interface at the renter's premises. The renter's terminal equipment is therefore not included in the link (see Figure 1/M.900).

1.2 terminal national section

The lines and apparatus between the defined test access points at the interface in the renter's premises and corresponding defined test access points at the terminal national centre.

1.3 national main section

The whole of the assembly of national group or supergroup sections connecting the defined test access points at the terminal national centre and defined test access points at the terminal international centre.

1.4 international main section

The whole of the assembly of national and international group or supergroup sections, between the defined test access points at the two terminal international centres (see Recommendation M.460 [4]). These access points should be the same points as those for the ends of the national main sections involved in the leased link.

1.5 terminal national centre

The nearest national installation (for example, a repeater station) to which the renter's equipment is connected by the terminal national section. This centre will normally be staffed and equipped to make transmission measurements.

1.6 terminal international centre

The international centre (for example, an international repeater station) serving the renter in the country in which the renter's installation is situated. There will be two terminal international centres in an international leased group or supergroup link or more in the case of a multiterminal link.

2 Composition

2.1 International leased group or supergroup links will be set up on plant that is similar to that used for providing national and international groups or supergroups for public services, that is on symmetric pair, coaxial cable, radio-relay, etc., systems and will follow similar routes.

2.2 The leased group or supergroup link

2.2.1 Figure 1/M.900 gives an example of the basic composition of a leased group or supergroup link and of the nomenclature used.

In general such a link will consist of a number of national and international sections interconnected by through-connection equipment, but it should be noted that in order to achieve particular transmission characteristics some restriction is placed on the degree of complexity of the routing of the link.

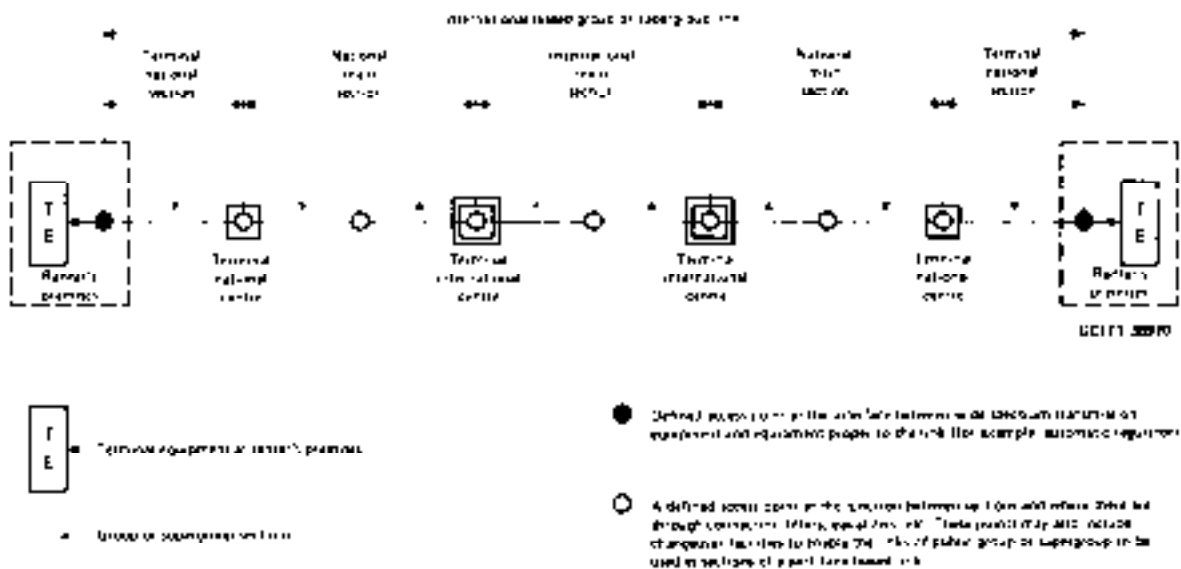


FIGURE 1/M.900 Example of the basic constitution of an international leased group or supergroup link for wide-spectrum signal transmission

2.2.2 Two basic types of centre are shown in Figure 1/M.900. These are:

- a) the terminal international centre, and
- b) the terminal national centre.

These define the limits of the national and international main sections and feature in the overall line-up and subsequent maintenance of the link.

2.3 *National and international main sections*

2.3.1 When establishing the constitution of national and international main sections the number of group sections within each main section should be kept to a minimum. This is necessary to:

- minimize the amount of group-delay distortion correction required;
- to simplify the effort necessary for the satisfactory maintenance of the link.

2.3.2 Where possible, it is desirable that each national and international main section be provided on a single group or supergroup section.

In practice, however, it may not always be possible to satisfy this requirement. Two group or supergroup sections per main section should be considered as the normal limit, to be exceeded in exceptional circumstances only.

2.4 *Terminal national sections*

Terminal national sections will usually be provided on plant which differs from that normally used for national or international groups or supergroups.

In most cases, such terminal sections may be provided on:

- symmetric pair cable specially provided between the terminal national centre (repeater station) and the renter's premises;
- existing local line plant possibly involving intermediate installations (for example, telephone exchanges) in the local network;
- combinations of the above.

The particular routing arrangements and the constitution of such sections are determined by the national practice of the country concerned.

2.5 *Choice of the group position within a supergroup*

It is very desirable, when choosing the routing of a group, to avoid the use of groups 1 and 5 as far as possible because of the difficulties which may be experienced in equalizing for group-delay distortion due to the edge characteristics of such group sections.

3 Provision of group or supergroup reference pilots and automatic regulators

3.1 *Pilots*

3.1.1 A group or supergroup reference pilot frequency as recommended by the CCITT (Recommendation M.460 [4]) should be transmitted on all international leased links for maintenance and regulation purposes.

Following national practice, the pilot may be injected either at the sending modem (as provided for in the Recommendation cited in [5], for example), or at the first repeater station (terminal national centre). When a pilot is injected at a renter's premises, it is recommended that the frequency of the pilot shall be one of those mentioned in Recommendation M.460 [4] (preferably 104.080 kHz and 547.920 kHz respectively), and that the pilot signal shall conform in all respects to the requirements in that Recommendation.

3.2 *Group and supergroup link regulation*

An automatic regulator should be provided on an international group or supergroup leased link in order to ensure the necessary overall stability of the link.

The point of insertion of such a regulator may be at the renter's premises or at the terminal national centre depending upon the particular arrangement of the Administration concerned.

References

- [1] CCITT Recommendation *Characteristics of group links for the transmission of wide-spectrum signals*, Vol. III, Rec. H.14.
- [2] CCITT Recommendation *Characteristics of supergroup links for the transmission of wide-spectrum signals*, Vol. III, Rec. H.15.
- [3] CCITT Recommendation *Definitions concerning international transmission systems*, Vol. IV, Rec. M.300.
- [4] CCITT Recommendation *Bringing international group, supergroup, etc., links into service*, Vol. IV, Rec. M.460.
- [5] CCITT Recommendation *Data transmission at 48 kilobits per second using 60-108 kHz group band circuits*, Vol. VIII, Rec. V.35, § 7.