



INTERNATIONAL TELECOMMUNICATION UNION

**ITU-T**

**M.1030**

TELECOMMUNICATION  
STANDARDIZATION SECTOR  
OF ITU

**MAINTENANCE:  
INTERNATIONAL LEASED CIRCUITS**

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**CHARACTERISTICS OF ORDINARY  
QUALITY INTERNATIONAL LEASED  
CIRCUITS FORMING PART OF  
PRIVATE SWITCHED TELEPHONE  
NETWORKS**

**ITU-T Recommendation M.1030**

(Extract from the *Blue Book*)

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## NOTES

1 ITU-T Recommendation M.1030 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.

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## Recommendation M.1030

### CHARACTERISTICS OF ORDINARY QUALITY INTERNATIONAL LEASED CIRCUITS FORMING PART OF PRIVATE SWITCHED TELEPHONE NETWORKS

#### 1 General

##### 1.1 *Scope*

This Recommendation details the characteristics of an international leased circuit intended to form part of a private switched telephone network. The requirements of this Recommendation are intended to ensure the provision of a circuit suitable for telephony purposes. Such circuits may be used either singly, and thus provide for speech communication between two private telephone exchanges in different countries, or as part of a connection within a private switched telephone network covering two or more countries.

It should be noted that not all Administrations provide circuits of the type covered by this Recommendation.

Recommendation G.171 [1] contains the transmission planning considerations upon which the characteristics given in § 2 below are based, and specifies the maximum number of circuits in tandem which the transmission plan permits<sup>1)</sup>.

##### 1.2 *Terminology*

###### 1.2.1 *Circuit access points*

The term “circuit access points” is used in this Recommendation with the same meaning as that given in Recommendation M.565 [2]. The precise location of, and relative levels at, the circuit access points are determined by the involved Administrations in collaboration with the renter concerned.

###### 1.2.2 *Four-wire circuits*

This term is intended to cover circuits which are switched on a 4-wire basis, are available via 4-wire circuit access points, and do not contain 2-wire circuit sections.

###### 1.2.3 *Two-wire presented circuits*

This term is used to cover circuits which do not meet the criteria set out in § 1.2.2 above, for example, circuits between exchanges using 2-wire switching.

#### 2 Characteristics

##### 2.1 *Nominal overall loss*

It is not possible to specify the nominal overall loss between actual switching points, or between circuit access points, because of the freedom afforded Administrations in choosing the relative transmission level at these points.

In order to ensure satisfactory loss and stability performance on end-to-end connections within private switched networks, the overall loss of interconnecting international leased circuits may need to be the subject of bilateral discussion between the terminal Administrations. In this connection, see also § 3 below.

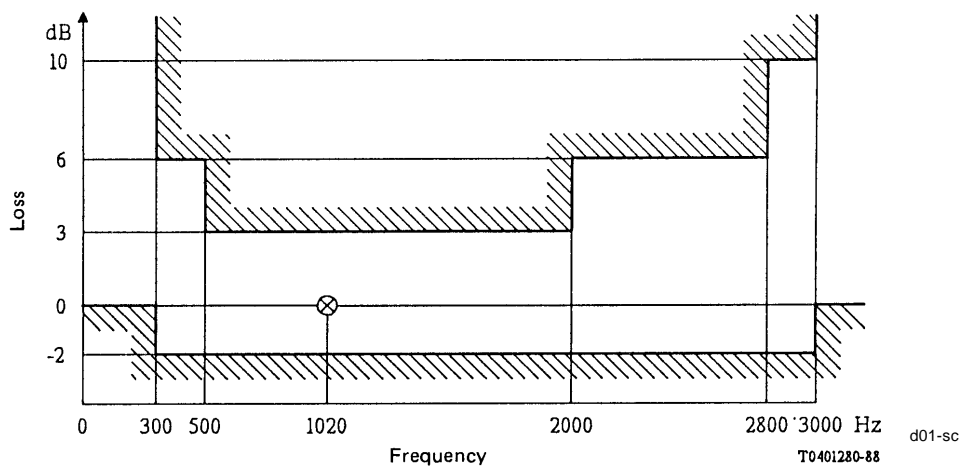
##### 2.2 *Loss/frequency distortion*

The limits for overall loss relative to that at 1020 Hz are given in Figure 1/M.1030 and Figure 2/M.1030 for 4-wire and 2-wire presented circuits respectively. It may be noted that the limits in Figure 2/M.1030 are the same as those appearing in Recommendation M.1040, § 2.2.

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<sup>1)</sup> Recommendation G.171, § 1 [1] states that for connection between private telephone networks and the public network, when permitted, “assurance cannot always be given that transmission performance to CCITT standards will be obtained.” The same may be said for connections achieved by a user over which an Administration has no control, for example, between two or more private networks by virtue of user provided private automatic branch exchanges (PABXs).

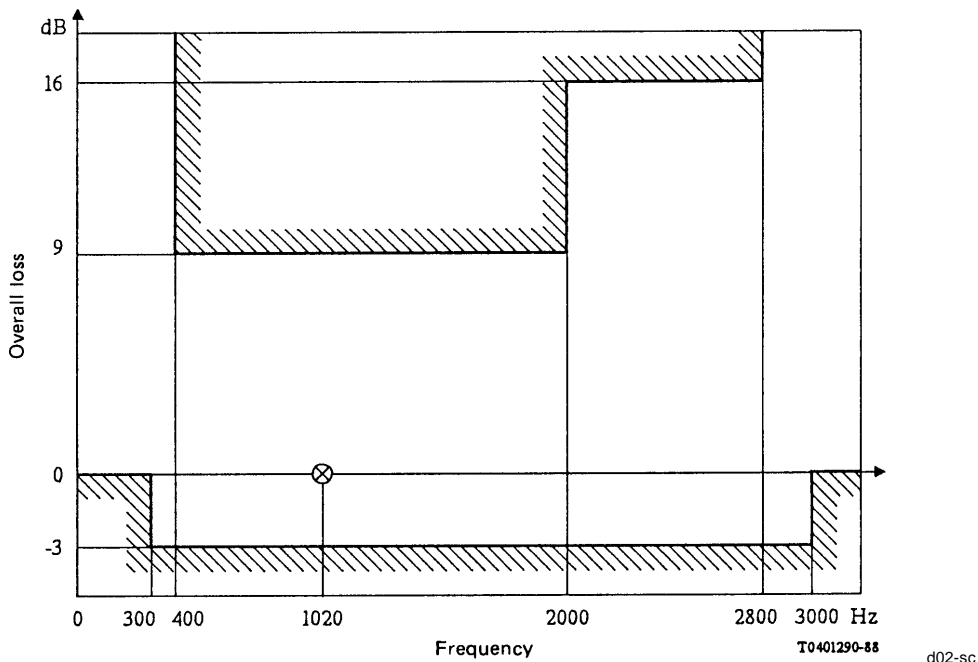
Exceptionally, where a 2-wire private telephone exchange originates and terminates traffic in an otherwise 4-wire network, the 4-wire section of an international leased circuit terminated on that exchange should meet the requirements of Figure 1/M.1030.



Note – Below 300 Hz and above 3000 Hz the loss shall not be less than 0.0 dB but is otherwise unspecified. These frequencies should be confirmed or amended after further study.

FIGURE 1/M.1030

Limits for overall loss of the circuit relative to that at 1020 Hz for 4-wire circuits



Note – Below 300 Hz and above 3000 Hz the loss shall not be less than 0.0 dB, but is otherwise unspecified. These frequencies should be confirmed or amended after further study.

FIGURE 2/M.1030

Limits for overall loss of the circuit relative to that at 1020 Hz for 2-wire presented circuits

2.3 *Variations of overall loss with time*

For all circuits, variation with time of the overall loss at 1020 Hz (including daily and seasonal variations but excluding amplitude hits) should be as small as possible but should not exceed  $\pm 4$  dB.

2.4 *Random circuit noise*

The nominal level of psophometric noise power depends upon the actual constitution of the circuit, in particular upon the length of circuit of frequency division multiplex systems involved. The provisional limit for circuits of lengths greater than 10 000 km is  $-38$  dBm0p. However, circuits of shorter length will have substantially less random noise (see Annex A to this Recommendation and Recommendation M.1050, § 3.5).

2.5 *Echo*

The provisions of Recommendations G.122 [3] and G.131 [4] concerning echo control should be observed in so far as they are applicable.

**3 Stability**

National systems interfacing with the international leased circuits dealt with in this Recommendation should comply with the stability requirements of Recommendation G.122 [3].

Recognizing that national private switched networks (planned in accordance with national transmission standards) may ultimately be interconnected by international leased circuits, involved Administrations may need to discuss the actions necessary to ensure adequate stability of the resulting international private switched network.

ANNEX A

(to Recommendation M.1030)

Random circuit noise

Figure A-1/M.1030 displays random noise versus length of circuit of FDM carrier systems and is presented as a guide to the random noise performance which may be found on an international leased circuit.

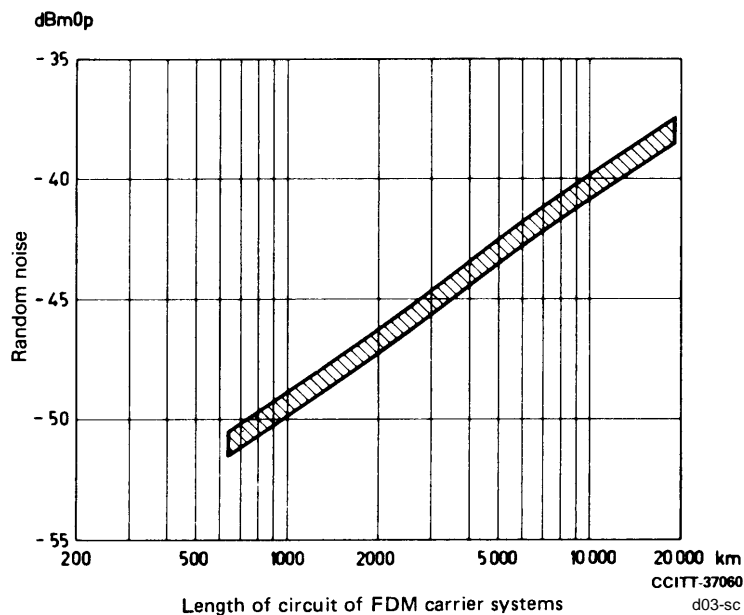


FIGURE A-1/M.1030

**Random circuit-noise performance**

*Note* – At the present time the section of the circuit provided by satellite (between earth stations) employing FDM techniques contributes approximately 10 000 pW0p (–50 dBm0p) of noise. Therefore, for the purpose of determining maintenance limits for noise measurement on leased circuits, the length of the section provided by satellite may be considered to be equivalent to 1000 km in Figure A-1/M.1030.

The contribution to noise of a circuit section provided by satellite employing TDM techniques remains as a subject for further study.

#### **References**

- [1] CCITT Recommendation *Transmission plan aspects of private operated networks*, Vol. III, Rec. G.171.
- [2] CCITT Recommendation *Access points for international telephone circuits*, Vol. IV, Rec. M.565.
- [3] CCITT Recommendation *Influence of national systems on stability, talker echo and listener echo in international connections*, Vol. III, Rec. G.122.
- [4] CCITT Recommendation *Stability and echo*, Vol. III, Rec. G.131.