



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

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TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

**MAINTENANCE :
INTERNATIONAL TELEPHONE CIRCUITS**

**ACCESS POINTS FOR INTERNATIONAL
TELEPHONE CIRCUITS**

ITU-T Recommendation M.565

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation M.565 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.

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ACCESS POINTS FOR INTERNATIONAL TELEPHONE CIRCUITS

1 General

This Recommendation specifies the access points required for testing and measuring purposes on international telephone circuits. (Access points for other types of circuit are dealt with in Recommendation M.110.)

2 Types of access point and their uses

2.1 Three basic types of access points are required for international telephone circuits. These should be provided and used in accordance with the following principles:

2.1.1 The international circuit for public telephony includes the international line (as defined in Recommendation M.700). Points serving to distinguish the ends of the international line should be provided, where possible, in the form of 4-wire access points called line access points as defined below.

line access points (points d'accès à la ligne – puntos de acceso a la línea)

Points used by the CCITT to define the limits of an international line, and from which measurements are made. Only one "line access point" exists at each end of an international line. The precise location of each such point depends on the Administration concerned¹⁾.

Where a digital international exchange is interfaced with the transmission network by primary (or higher order) digital paths, a line access point at "circuit" level cannot generally be provided. In this case, any necessary testing of circuits normally carried out at the line access point may be performed at the digital path access point²⁾ nearest to the international exchange. Circuit tests which involve the sending of test signals should be carried out from the circuit access point as defined in § 2.1.2 below.

2.1.2 At the international switching centres, at the terminals of a circuit, "circuit access points" as defined below should be provided.

circuit access points (points d'accès au circuit – puntos de acceso al circuito)

Four-wire access points so located that as much as possible of the international circuit is included between corresponding pairs of these access points at the two centres concerned. These points, and their relative level (with reference to the transmission reference point) are determined in each case by the Administration concerned. They are taken as the basic practical reference points of known relative level to which other transmission measurements will be related. In other words, for measurement and lining-up purposes, the level at the appropriate circuit access point is the relative level with respect to which other levels are adjusted.

The requirement to provide a circuit access point within a digital international exchange will be met by any suitable method of obtaining access to the digital bit sequence (time slot) corresponding to an individual telephone circuit.

Where a circuit uses channel associated signalling it should be possible to identify and measure at the circuit access points, the signal-transmission parameters, e.g., type of signal, sequence, timing, duration, level and frequency.

2.1.3 Where an international telephone circuit appears at its basic frequencies or basic bit rate within a transit country, an intermediate access point for testing and measuring purposes should be provided at that location in the transit country.

2.2 The line access points and circuit access points (and any intermediate access points in transit countries) will be used by the appropriate testing points³⁾ in all tests and measurements for the line-up and maintenance of international telephone circuits.

1) A compandor, if fitted, should be connected on the line side of the line access points and not between the line access point and the circuit access point. In this way the relationship between the nominal transmission levels at these two points on a circuit with a compandor is the same as for other circuits.

2) The access points required for digital leased circuits have yet to be specified. This matter is for further study by Study Group IV, in association with Study Group XV.

3) For example, those defined in Recommendations M.717 and M.718.

2.3 At the discretion of Administrations, means of giving access to the circuit access points and/or the line access points from remote locations may be provided – such remote locations being within or outside the international centre. Such arrangements avoid the need for staff to enter equipment areas for circuit testing purposes, and increase the flexibility and efficiency of the maintenance organization where large numbers of circuits must be maintained.

2.4 In order to line-up and maintain circuits routed on a mixture of analogue and digital systems it is necessary to carry out measurements of analogue circuit parameters at digital international exchanges. If this requirement cannot be met by suitable digital test equipment, it may be necessary to provide a “test coder/decoder” to convert digital access points (operated at 64 kbit/s for example) to analogue access points (at voice frequency), thus enabling analogue measuring equipment to be used.

2.5 Figure 1/M.565 shows typical access and test equipment arrangements for analogue and digital international exchanges. Subject to meeting the requirements in §§ 2.1 to 2.4 above, the actual arrangements at a particular international centre are left to the discretion of the Administration concerned.

Note – Remote access arrangements, as described in § 2.3, are only a physical extension of the access points to a more convenient location(s). Thus, in the Series M Recommendations, the terms “line access points” and “circuit access points” are used (without qualification) irrespective of the manner in which the required access is obtained.

3 Transmission characteristics and choice of levels at analogue access points

3.1 The impedance at analogue access points should have a return loss against the nominal impedance of the measuring apparatus of the station (for example 600 ohms, nonreactive) of not less than 20 dB over the range 600-3400 Hz and not less than 15 dB over the range 300-600 Hz.

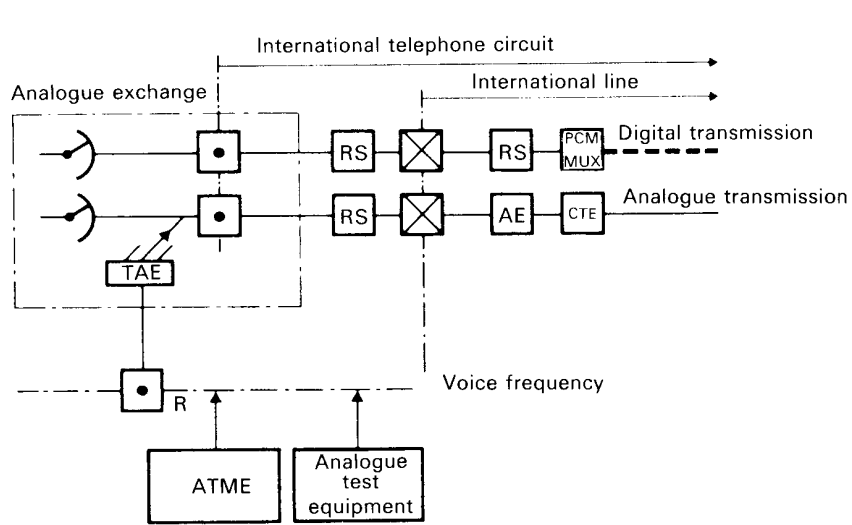
3.2 It should be recognized that the analogue link access point shown in Figure 1b/M.565 is suitable only as a maintenance access point. It is not intended for the setting-up or lining-up of individual circuits, because the circuit levels at these points are not specifically defined. This occurs because the shape of the group and supergroup filters have not been compensated for at this point by the channel translating equipment adjustments.

3.3 It is not possible to recommend a value for the nominal transmission loss between the circuit access points of a switched public telephony circuit, because of the freedom accorded to Administrations in choosing the transmission levels at these points. However, bearing in mind that the attenuation between the circuit access points and the virtual analogue switching points will have a fixed and known value and that it is possible to build out the wiring to circuit access points to a known loss, the send and receive level at the circuit access point should be chosen such that the circuit level diagram is respected.

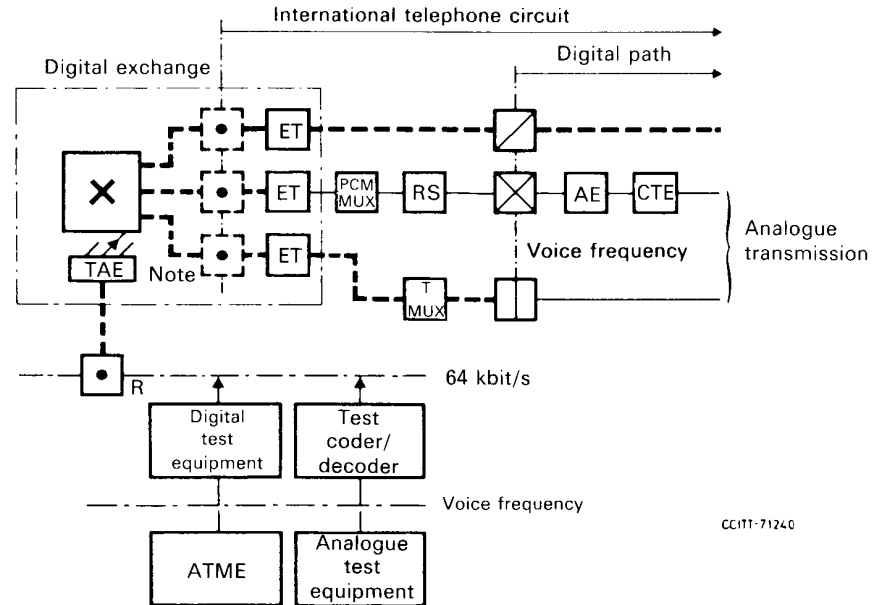
3.4 It is advantageous to adopt the same value of relative level at the send line access points for every circuit connected to the exchange. Similarly, all the receive line access points could also be at a particular common nominal value of relative level. When relative levels are made uniform in this way, line-up and maintenance activity is greatly simplified. Also, lines can be readily cross-connected at the line access points, which is useful in the immediate replacement of faulty lines in an emergency.

3.5 If the nominal relative level at the receive line access point is chosen to be higher than that at the send line access point of the same exchange, this level difference can be used to offset the inherent transmission loss in the signalling and switching equipment, and the requirements of the CCITT transmission plan can be met without the obligation to install supplementary audio-frequency amplifiers.

Note – It is preferred to make transmission measurements between 4-wire access points but, as a permissible alternative, a terminating unit may be provided together with an associated 2-wire access point for measurement purposes. The transmission levels and losses must be chosen so that the nominal loss between virtual analogue switching points is 0.5 dB (or 0.0 dB for wholly digital circuits), and the circuit level diagram is respected.

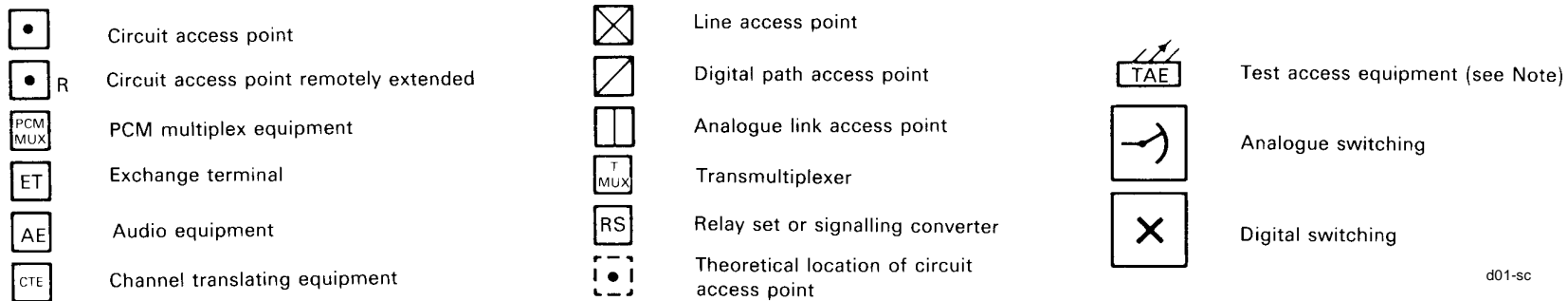


a) Analogue international centre



b) Digital international centre

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Note – Access is normally provided by the exchange switching equipment.

FIGURE 1/M.565

Typical access and test equipment arrangements at international centres

4 Interface requirements at digital access points

4.1 Digital access points at 64 kbit/s should be operated in the contradirectional mode and should meet the interface requirements of § 1.2.3 of Recommendation G.703 [1].

4.2 Digital path access points, operated at 1544 kbit/s or 2048 kbit/s (or higher hierarchical bit rates) should meet the interface requirements of Recommendation G.703 [1].

4.3 Interface requirements for digital access points on circuits using an encoding technique other than PCM are under study by Study Group IV.

Reference

- [1] CCITT Recommendation, *Physical electrical characteristics of hierarchical digital interfaces*, Vol. III, Rec. G.703.