INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

G.901

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

DIGITAL SECTIONS AND DIGITAL LINE SYSTEMS

GENERAL CONSIDERATIONS ON DIGITAL SECTIONS AND DIGITAL LINE SYSTEMS

ITU-T Recommendation G.901

(Extract from the *Blue Book*)

NOTES

1   ITU-T Recommendation G.901 was published in Fascicle III.5 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 G.901

GENERAL CONSIDERATIONS ON DIGITAL SECTIONS
AND DIGITAL LINE SYSTEMS

(Geneva, 1980; further amended)

1 Digital sections and digital systems

The term digital section is used in these Recommendations as a general term to include digital line section and digital radio section. This term is defined in Recommendation G.701 (see also Figure 1/G.701 and Figure 2/G.960). Digital sections are defined as component parts of digital links operating at particular bit rates and may be regarded as "black boxes". For digital sections used in digital hierarchy (network) applications the inputs and outputs are recommended in the form of "equipment interfaces" (i.e. in Recommendation G.703 for hierarchical bit rates or in the Recommendation G.931 for non-hierarchical bit rates). For digital sections used for ISDN customer access the "section boundaries" are at the T reference point and the appropriate V reference point. User-network interfaces which may be used at the T reference point are recommended in the I.400 series of Recommendations and the exchange interfaces which may be used at the V reference points are recommended in the Q.500-Series of Recommendations. Digital section Recommendations contain the common network-related requirements applicable to digital radio, metallic and optical transmission systems. The performance requirements relate to network performance objectives.

Digital line and radio systems are the means of providing digital sections. Recommendations on digital line and radio systems may recognize, for digital sections operating at a given bit rate, specific transmission media and transmission techniques. Performance requirements of digital line and radio systems are for the guidance of system designers (equipment design objectives) and may be related to hypothetical reference digital sections of defined constitution.

All digital line and radio systems operating at a given bit rate and for use in a particular part of the network shall comply with the characteristics of the digital section appropriate for that network application.

Digital radio system requirements are covered in CCIR Recommendations.

2 International interconnections

For international interconnections CCITT recommends:

1) as preferred solution interconnections at equipment interfaces operating at hierarchical bit rates, the connections shown in Figures l a)/G.901 and 2 a)/G.901;

2) as second priority solution interconnections at equipment interfaces operating at non-hierarchical bit rates, the connections shown in Figure 2b)/G.901;

3) that line interfaces as indicated in Figure 1b)/G.901 and Figure 2c)/G.901 are not intended to be used as international interconnection points.

All parameters necessary for interconnection at equipment interfaces will be covered by that part of the Recommendation that deals with "Characteristics of digital line sections".

Equipment interfaces as used in the following Recommendations refer to interfaces as specified in Recommendation G.703 and may either refer to a direct connection between terminating equipments or to a connection at a digital distribution frame.
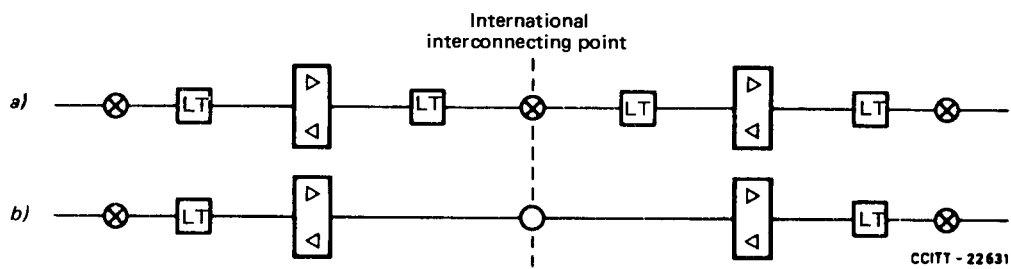
FIGURE 1/G.901

Alternatives for interconnection of line transmission systems operating at hierarchical bit rates
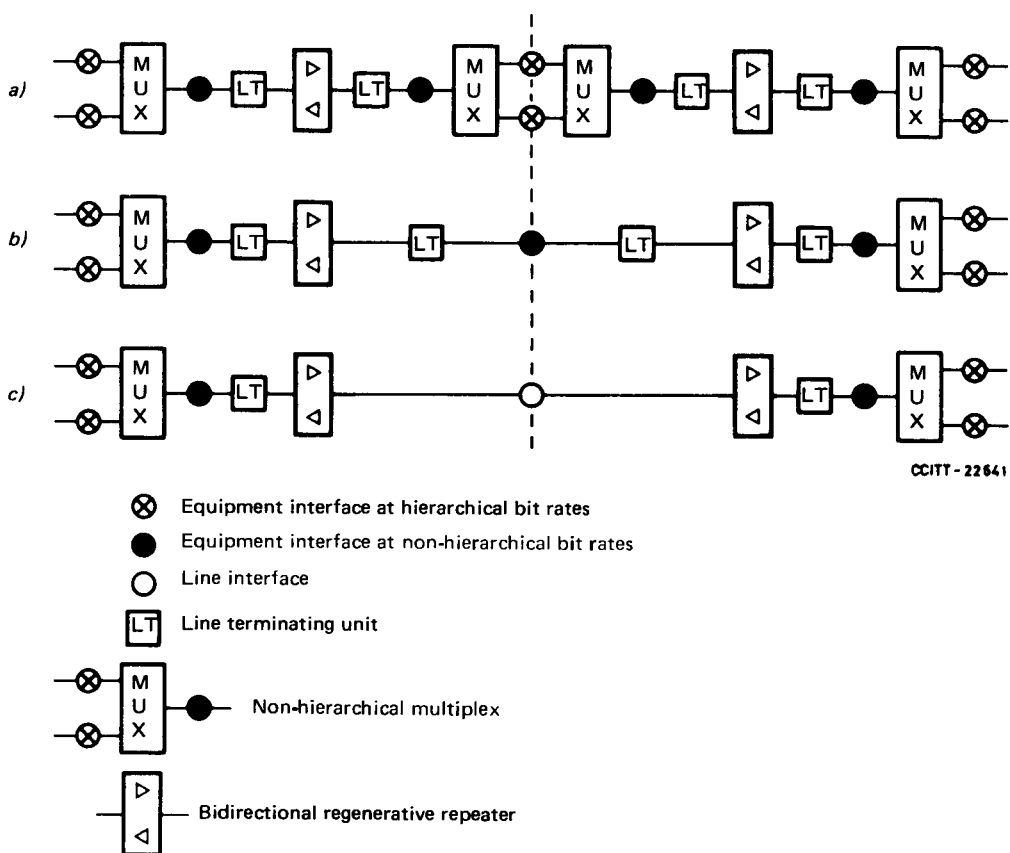
⊗ Equipment interface at hierarchical bit rates

● Equipment interface at non-hierarchical bit rates

○ Line interface

LT Line terminating unit

Non-hierarchical multiplex

Bidirectional regenerative repeater

FIGURE 2/G.901

Alternatives for interconnection of line transmission systems operating at non-hierarchical bit rates

3   ISDN customer access

Digital sections and digital line systems for the ISDN customer access are recommended specifically for those applications and are not part of the "digital hierarchy". Whereas other digital section and digital line system Recommendations are symmetrical (i.e. the line terminations have the same functionality at each end), those for the ISDN customer access are asymmetrical in respect of certain functions (i.e. bit timing, octet timing, activation/deactivation, power feeding, operations and maintenance). This is because of the inherent asymmetry of the local line distribution network and different requirements of exchange interfaces to user-network interfaces.

Bibliography

CCITT Recommendation *Transmission performance objectives and Recommendations,* Vol. III, Rec. G.102.