INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

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G.421

INTERNATIONAL ANALOGUE CARRIER SYSTEMS

GENERAL CHARACTERISTICS OF INTERNATIONAL CARRIER TELEPHONE SYSTEMS ON RADIO - RELAY OR SATELLITE LINKS AND INTERCONNECTION WITH METALLIC LINES

METHODS OF INTERCONNECTION

ITU-T Recommendation G.421

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation G.421 was published in Fascicle III.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 G.421

METHODS OF INTERCONNECTION

In studying the interconnection of radio-relay systems, either with one another or with systems on metallic lines, distinction should be made between the following cases:

1 Interconnection at audio-frequencies

This is the normal method, at the present stage of technical development, whenever a radio-relay system using time-division multiplex is involved[1)]. Operational requirements may be such that it is also necessary in the case of frequency-division multiplex and of systems on metallic lines.

2 Interconnection by through-group connection

With present technical development only radio-relay links having frequency-division multiplex can provide telephone channels assembled in groups, supergroups, mastergroups, and in some cases, supermastergroups or in 15-supergroup assemblies[1)].

Interconnection between a radio-relay system using frequency-division multiplex and a system on metallic lines can be carried out by through-connection of groups, supergroups, etc. This is possible because, according to the provisions of Recommendation G.423, the baseband of such a radio-relay system corresponds to that of a certain number of groups, supergroups or mastergroups transmitted to line in coaxial cable systems. These groups can be obtained from the relevant basic frequency band by means of translating equipment already standardized for cable systems in accordance with CCITT Recommendations.

Through-connection should then be carried out in accordance with Recommendation G.242, via the basic frequency range for groups (12 to 60 kHz or 60 to 108 kHz), for supergroups (312-552 kHz), etc. (see Recommendation G.211 and Figure 1/G.211, in particular).

3 Interconnection in the baseband

The baseband of frequency-division multiplex radio-relay links is the same as the frequency band of carrier systems on metallic lines, and interconnection in this band is possible in the conditions specified in Recommendation G.423.

Direct through-connection may also be made in this baseband, between metallic-line systems and radio-relay links, in accordance with the general provisions of Recommendation G.242, § 7.

For time-division multiplex radio-relay links, the baseband had been defined by the CCIR as "the series of modulated pulses before it is applied to the carrier frequency". Interconnection in the baseband of time-division radio-relay links with metallic-line systems has not yet been studied.

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1) *Note from the Secretariat* - This text relates to FDM radio-relay systems which were the subject of Recommendations G.432 and G.443 (now both deleted). As far as PCM radio-relay systems are concerned see CCIR Report 378 [1].

4 Interconnection at intermediate frequencies

5 Interconnection at radio frequencies

§§ 4 and 5 concern cases arising only in the interconnection of two radio-relay systems and are the concern of the CCIR.

Reference

[1] CCIR Report *Characteristics of digital radio-relay systems,* Vol. IX, Report 378, Dubrovnik, 1986.