



INTERNATIONAL TELECOMMUNICATION UNION

**ITU-T**

TELECOMMUNICATION  
STANDARDIZATION SECTOR  
OF ITU

**R.49**

**TELEGRAPHY**

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**INTERBAND TELEGRAPHY OVER  
OPEN - WIRE 3-CHANNEL CARRIER  
SYSTEMS**

**ITU-T Recommendation R.49**

(Extract from the *Blue Book*)

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## NOTES

1 ITU-T Recommendation R.49 was published in Fascicle VII.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.

## Recommendation R.49

### INTERBAND TELEGRAPHY OVER OPEN-WIRE 3-CHANNEL CARRIER SYSTEMS

(New Delhi, 1960)

The CCITT,

*considering*

(a) It is considered necessary to introduce, for international traffic, an open-wire carrier system that uses common line repeaters for telephone and interband telegraph channels.

(b) This is important for some Administrations that desire to have a small number of telegraph channels (up to six) without having to use a *standard* voice-frequency telegraph system on one of the telephone circuits, thereby effecting an economy, as all the telephone circuits are retained entirely for telephone traffic.

(c) The arrangement of line frequencies as far as the telephone channels are concerned should be as specified in Recommendation G.361 [1].

*unanimously declares the following view:*

**1** Four interband telegraph channels, for a modulation rate of 50 bauds, can be set up over an open-wire carrier system by the use of line repeaters common to the telephone channels and the telegraph channels provided that the system in question conforms to the Recommendation cited in [2].

**2** The nominal frequencies of these four telegraph channels are as follows:

2.1 *Low-frequency direction of transmission:*

3.22 – 3.34 – 3.46 and 3.58 kHz.

2.2 *High-frequency direction of transmission:*

a) telephone channels occupying the frequency band 18 and 30 kHz:  
30.42 – 30.54 – 30.66 and 30.78 kHz;

b) telephone channels occupying the frequency band 19 and 31 kHz:  
18.22 – 18.34 – 18.46 and 18.58 kHz.

**3** When in-band signalling is employed on the telephone channels (as opposed to out-band signalling outside the 4-kHz bandwidth), it becomes possible to provide two additional telegraph channels having the following nominal frequencies:

3.1 *Low-frequency direction of transmission:*

3.70 and 3.82 kHz.

3.2 *High-frequency direction of transmission:*

a) telephone channels occupying the frequency band 18 and 30 kHz:  
30.18 and 30.30 kHz;

b) telephone channels occupying the frequency band 19 and 31 kHz:  
18.70 and 18.82 kHz.

**4** In those cases where, as a result of agreement between the Administrations concerned, the system employs an upper pilot of 17.800 kHz, the following frequencies may be used as alternatives to those specified in § 2.2 b) and § 3.2 b) above. This alternative arrangement permits, in certain types of systems, a more economical modulation process: 31.42 – 31.54 – 31.66 and 31.78 kHz, instead of 18.22 – 18.34 – 18.46 and 18.58 kHz, also 31.18 and 31.30 kHz instead of 18.70 and 18.82 kHz.

5 This Recommendation applies to amplitude-modulated telegraphy and to frequency-modulated telegraphy.

6 It is not considered desirable to standardize absolutely the power transmitted to the line as this may be dependent upon the conditions on the open-wire route. Under favourable conditions a recommendable value for the power on each telegraph channel would be  $-20$  dBm0 (referred to one milliwatt at a point of zero relative level).

7 For amplitude modulation the tolerance on the sent frequency will be  $\pm 6$  Hz and for frequency modulation the tolerances given in Recommendation R.35 will apply.

8 In tests made on the local end, equipments should meet the distortion conditions described in § (2) of Recommendation R.50 for amplitude modulation, and those described in § 13 of Recommendation R.35 for frequency modulation.

9 The correspondence between the significant conditions described in § 15 of Recommendation R.31 and § 9 of Recommendation R.35 applies to these channels for interband telegraphy.

#### **References**

- [1] CCITT Recommendation *Systems providing three carrier telephone circuits on a pair of open-wire lines*, Rec. G.361.
- [2] *Ibid.*, § 2.