

Note 8 — The concept of pilot level deviation alarm corresponds to a variation on the level of the pilot from its nominal value by more than ± 4 dB as stated in the Recommendation cited in [10]. This applies only to transmultiplexers with automatic internal level regulation.

Note 9 — The "system" fault condition corresponds to a fault on the transmultiplexer detected by the transmultiplexer's supervision system, when it has one.

Note 10 — The "synchronization" fault is that mentioned in § 6 of the Recommendation G.793. When the transmultiplexer is synchronized with an external signal or with one of the two incoming PCM streams at 2048 kbit/s, the transmultiplexer should transmit an alarm signal in the event of synchronization loss.

References

- [1] CCITT Recommendation *Recommendations concerning translating equipments*, Vol. III, Rec. G.233.
- [2] CCITT Recommendation *Pilots on groups, supergroups, etc.*, Vol. III, Rec. G.241.
- [3] CCITT Recommendation *Interruption control*, Vol. VI, Rec. Q.416.
- [4] CCITT Recommendation *Recommendations relating to the accuracy of carrier frequencies*, Vol. III, Rec. G.225.
- [5] CCITT Recommendation *Signal receiver*, Vol. VI, Rec. Q.415.
- [6] CCITT Recommendation *Signal sender*, Vol. VI, Rec. Q.414.
- [7] CCITT Recommendation *Digital line signalling code*, Vol. VI, Rec. Q.421, § 3.1.2.
- [8] CCITT Recommendation *Conversion between analogue and digital versions of system R2 line signalling*, Vol. VI, Rec. Q.430.
- [9] CCITT Recommendation *Interruption control*, Vol. VI, Rec. Q.416, §§ 2.4.3.2 and 2.4.3.3.
- [10] CCITT Recommendation *Pilots on groups, supergroups, etc.*, Vol. III, Rec. G.241, § 1.
- [11] CCITT Recommendation *Protection against the effect of faulty transmission on groups of circuits*, Vol. VI, Rec. Q.33.

Recommendation G.794

CHARACTERISTICS OF 24-CHANNEL TRANSMULTIPLEXING EQUIPMENTS

(Malaga-Torremolinos, 1984, amended at Melbourne, 1988)

1 Introduction

The 24-channel transmultiplexer is a transmultiplexing equipment which satisfies Recommendations G.791 and G.792 and provides interconnection between a digital signal at 1544 kbit/s and two analogue basic groups (24-channel TMUX-P).

2 Digital interfaces

2.1 Coding law

The coding law used is μ -law specified in Recommendation G.711.

2.2 Interfaces

The 1544 kbit/s interfaces satisfy Recommendation G.703, § 2.

2.3 *Frame structure*

The 1544 kbit/s frame structure satisfies Recommendation G.704, § 3.1.1.

2.4 *Multiframe structure*

The multiframe structure carried on the F-bit satisfies Recommendation G.704, § 3.1.1.

3 *Analogue interfaces*

3.1 *Ports*

The analogue interface consists of two 12-channel groups (band 60-108 kHz) which satisfies Recommendation G.232.

The preferred signal levels at the group distribution frame satisfy Recommendation G.233.

3.2 *Pilots*

The 24-channel transmultiplexer should transmit and receive the group pilot in Recommendation G.241.

3.3 *Pilot detection and regulation*

The transmultiplexer may or may not regulate levels on the basis of the levels of the group pilots. If so, the transmultiplexer must meet the conditions of Recommendation G.241.

4 *Correspondence between analogue and digital channels*

A fixed correspondence is established between the analogue and digital channels. The following correspondence:

PCM 1:	Basic group 1
Channels 1 to 12:	60-108 kHz
PCM 1:	Basic group 2
Channels 13 to 24:	60-108 kHz

5 *Synchronization of transmultiplexer*

The transmultiplexer must produce virtual analogue carrier frequencies with the accuracy specified in Recommendation G.225 ($\pm 10^{-7}$).

For this purpose, it is recommended:

- a) either that the transmultiplexer should have an internal clock of sufficient accuracy;
- b) or that the transmultiplexer should be synchronizable with an external signal which may be:
 - 1) a frequency produced by a central generator: 4, 12, 124 kHz;
 - 2) or one of the incoming PCM streams which has sufficient accuracy (this may be the case, for example when this PCM stream 1544 kbit/s is produced by a TDM switching equipment).

Note 1 — In the case of a digital filtering transmultiplexer, when synchronization on the incoming PCM stream is not possible, the remote digital terminal should have the sending side synchronized with the receiving side so as to avoid slipping at the transmultiplexer input.

Note 2 — In the case of external synchronization, transmultiplexers often have an internal oscillator locked to the external signal. If, upon loss of the external sync signal, this internal oscillator is allowed to continue to supply the clock for the outgoing digital signal (now in the free-running mode), then this oscillator should have a minimum free-running accuracy of 50×10^{-6} . This is intended to allow the distant end digital terminal to receive an adequate frequency for alarm purposes only, so as not to confuse maintenance and trouble-shooting activities. Also, a local alarm should be given in the event of a fault in the synchronization system or in the absence of the external synchronization signal.