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ITU-T

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(ex CMTT.473)

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TELEVISION AND SOUND TRANSMISSION

INSERTION OF TEST SIGNALS IN THE FIELD-BLANKING INTERVAL OF MONOCHROME AND COLOUR TELEVISION SIGNALS

ITU-T Recommendation J.63

(Formerly Recommendation ITU-R CMTT.473)

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation J.63 (formerly Recommendation ITU-R CMTT.473) was elaborated by the former ITU-R Study Group CMTT. See Note 1 below.

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector (ITU-R).

Conforming to a joint decision by the World Telecommunication Standardization Conference (Helsinki, March 1993) and the Radiocommunication Assembly (Geneva, November 1993), the ITU-R Study Group CMTT was transferred to ITU-T as Study Group 9, except for the satellite news gathering (SNG) study area which was transferred to ITU-R Study Group 4.

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 J.63^{1) 2)}

INSERTION OF TEST SIGNALS IN THE FIELD-BLANKING INTERVAL OF MONOCHROME AND COLOUR TELEVISION SIGNALS

(1970; revised in 1974, 1978, 1982, 1986 and 1990)

The CCIR,

CONSIDERING

- (a) that it is already current practice in a number of countries to use insertion test signals in the field-blanking interval of monochrome and colour television signals;
- (b) that such signals can be used for the measurement of performance and the monitoring, control and correction of characteristics of international transmission circuits;
- (c) that Report 314 proposes that certain specific lines in each field be allocated for the insertion of special test signals for international transmissions;
- (d) that traffic demands may make it necessary to perform all operational measurements by means of insertion test signals, to an accuracy approaching that of conventional out-of-service measuring methods,

UNANIMOUSLY RECOMMENDS

1. that for the international transmission of television signals, insertion test signals in accordance with Annex I (625-line systems) and Annex II (525-line systems) may be inserted at the origin of the circuit;

Note. – As an interim measure some administrations may decide to omit some of the waveforms described. Where waveforms are omitted:

- waveforms other than those described should not be inserted;
 - care must be taken to ensure that the line-time luminance components of equivalent lines in each field (e.g. 17 and 330 for 625-line systems) are similar.
2. that these signals should neither be removed nor replaced on the international circuit, except possibly at a point of conversion of either standard or colour system.

ANNEX I

625-LINE SYSTEMS

1. Introduction

For the international transmission of 625-line television signals, Recommendation 472 and Report 314 propose the use of lines 17 (330) and 18 (331) for insertion test signals.

This Annex describes a comprehensive arrangement of insertion test signals (see Note) to which the following general considerations apply:

- it is assumed that the line duration H is divided into 32 equal time periods. This division defines the characteristic instants;
- the time periods shall not differ from each other by more than ± 40 ns;
- the characteristic instants are referred to the mid-amplitude point of the leading edge of the synchronizing pulse. The half-amplitude points of the luminance and chrominance transitions and the peaks of the pulses occur at the characteristic instants;

¹⁾ Formerly Recommendation ITU-R CMTT.473.

²⁾ ITU-T Recommendation N.67 has been amended to bring it into agreement with this Recommendation.

- the actual characteristic instants of any luminance waveform shall not differ by more than 250 ns from their nominal positions;
- except in the case of the 20T composite pulse, the actual characteristic instants of any chrominance waveform shall not differ by more than 500 ns from their nominal positions;
- the colour burst is present in the line-blanking period only in colour transmission;
- in the case of PAL transmissions, the chrominance sub-carrier of the insertion signals is locked at $60 \pm 5^\circ$ from the positive (B-Y) axis;
- harmonic distortion components of the sub-carrier shall be at least 40 dB below the level of the fundamental;
- the frequency of the sub-carrier is $4.433\,618\,75\text{ MHz} \pm 10\text{ Hz}$.

Note. – These are intended for use with colour television signals. The basic insertion test signal for monochrome transmissions is identical, with the following exceptions:

Line 17: element *F* is omitted;

Line 18: the luminance pedestal and elements C_1 and C_2 are omitted;

Line 330: element D_2 is replaced by D_1 ;

Line 331: the luminance pedestal and elements *G* and *E* are omitted.

The following additions to the basic monochrome insertion test signal may be found useful:

- (a) the luminance pedestal on lines 18 and 331 and elements C_1 and C_2 on line 18

and/or

- (b) the element *F* on line 17.

Alternatively, the whole of the signals may be utilized. The above modifications to the basic monochrome insertion test signal should, however, only be made with the agreement of the administrations concerned.

2. Particulars of signals inserted in line 17 (Fig. 1)

2.1 Luminance bar (reference white level) (B_2)

- position of transitions: $6H/32$ and $11H/32$, duration of bar $5H/32$;
- bar amplitude: $0.700 \pm 0.007\text{ V}$;
- rise and fall times of transitions: derived from the shaping network of the sine-squared pulse (element B_1);
- overshoot and undershoot $\leq 0.5\%$;
- tilt $\leq 0.5\%$.

2.2 2T sine-squared pulse (B_1)

- peak position: $13H/32$;
- amplitude: within $\pm 1\%$ of the amplitude of the luminance bar (B_2) (nominal value: 0.700 V);
- half-amplitude duration: $200 \pm 10\text{ ns}$ (see Note).

Note. – In some countries, members of the OIRT, the half-amplitude duration of the 2T sine-squared pulse may be 160 ns.

2.3 Composite 20T pulse (*F*)

- position of peak: $16H/32$;
- position of base: $15H/32 - 17H/32$;
- amplitude: within $\pm 1\%$ of the amplitude of the luminance bar (B_2) (nominal value: 0.700 V);
- half-amplitude duration: $2 \pm 0.06\text{ }\mu\text{s}$;
- perturbations of the pulse base-line, due to inherent chrominance-luminance amplitude and delay inequalities and different shape of the luminance and chrominance components: $\leq 0.5\%$ peak amplitude.

2.4 Five-riser luminance staircase (D_1) (see Note)

- position of successive transitions: $20H/32$, $22H/32$, $24H/32$, $26H/32$, $28H/32$ and $31H/32$ (fall);
- peak-to-peak amplitude of the staircase: within $\pm 1\%$ of the amplitude of the luminance bar (B_2) (nominal value: 0.700 V);

- nominal amplitude of risers: 1/5 of amplitude of the luminance bar (B_2) (nominal value: 0.140 V). The difference in amplitude between the largest and smallest risers must be less than 0.5% of the largest amplitude;
- rise and fall times of transitions: shaped by a Thomson filter (or similar network) with a transfer function modulus having its first zero at 4.43 MHz to restrict the amplitude of components of the luminance signal in the vicinity of the colour sub-carrier.

Note. – Some administrations may wish to superimpose a chrominance sub-carrier signal on this staircase. In this case, the position and duration of the sub-carrier are determined by instants $18H/32$ and $31H/32$. The other characteristics of this signal are identical to those described in § 4.3.2.

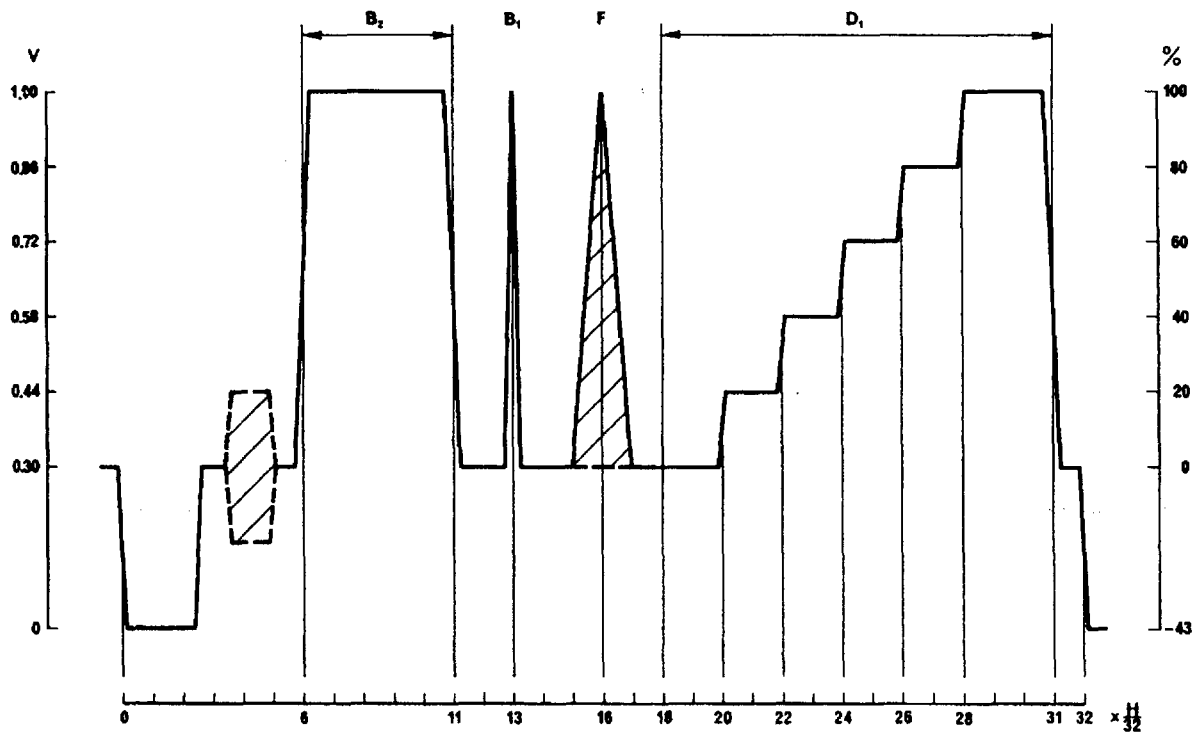


FIGURE 1 – Line 17

d01-sc

3. Particulars of signals inserted in line 18 (Fig. 2)

3.1 Luminance pedestal

- position of transitions: $6H/32$, $31H/32$;
- amplitude measured from blanking level: within $\pm 1\%$ of one-half of the amplitude of luminance bar (B_2) (nominal value: 0.350 V);

3.2 Reference bar signal (C_1)

- position of transitions: $6H/32$, $8H/32$, $10H/32$;
- amplitudes measured from blanking level:
 - 1st section: within $\pm 1\%$ of four-fifths of the amplitude of the luminance bar (B_2) (nominal value: 0.560 V);
 - 2nd section: within $\pm 1\%$ of one-fifth of the amplitude of the luminance bar (B_2) (nominal value: 0.140 V);
- rise and fall times of transitions: derived from the shaping network of the sine-squared pulse (element B_1).