INTERNATIONAL TELECOMMUNICATION UNION

ITU-T J.15

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

TELEVISION AND SOUND TRANSMISSION

LINING - UP AND MONITORING AN INTERNATIONAL SOUND - PROGRAMME CONNECTION

ITU-T Recommendation J.15

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation J.15 was published in Fascicle III.6 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 J.15

LINING-UP AND MONITORING AN INTERNATIONAL SOUND-PROGRAMME CONNECTION

(former Recommendation J.14; amended at Geneva, 1972 and 1980, and at Melbourne, 1988)

For the alignment of international sound-programme connections the CCIR, in Recommendation 661, recommends a *three-level test signal*.

This test signal is based on the test signal definitions given in CCIR Recommendation 645 and specifies a test signal which should be used on sound-programme circuits generally. A common alignment procedure for peak programme meters and VU-meters using the three-level test signal can be found in Annex I of CCIR Recommendation 645. From this information it can be seen what indicators will be produced by the three-level test signal on the different types of peak programme meters and volume meters.

To comply with the provisions of Recommendation J.14, the lining-up and monitoring of an international sound-programme connection should ensure that, during the programme transmission, the peak voltage at a zero relative level point will not exceed 3.1 volts, which is that of a sinusoidal signal having an r.m.s. value of 2.2 volts. The methods for achieving this condition as well as the relevant performance requirements are given in Recommendations N.10 to N.18 (see references [1] to [8]).

Some indication of the volume or of the peaks of the signals during programme transmission may be obtained by monitoring at the studio, in the repeater stations, or at the transmitter. One of the instruments, the characteristics of which are summarized in Table 1/J.15, may be used.

Since there is no simple relation between the readings given by two different instruments for all types of programme transmitted, it is desirable that the broadcast organization controlling the studio and the telephone Administration(s) controlling the sound-programme circuit should use the same type of instrument so that their observations are made on a similar basis.

In general the telephone Administration and the broadcast organization of a country agree to use the same type of instrument. It is desirable to reduce to a minimum the number of different types of instrument and to discourage the introduction of new types which only differ in detail from those already in service. The unified use of the peak indicator specified in reference [9] is under study.

During programme transmission, the signal level at the output of the last amplifier controlled by the sending broadcast organization (Point A of Figure 3/J.13) should be monitored to see that the meter deflection of the measuring instrument is always lower than the peak voltage for the overall line-up, allowance being made for the peak factor of the programme involved.

It should be remembered that the amplitude range from a symphony orchestra is of the order of 60 to 70 dB, while the specification for sound-programme circuits is based on a range of about 40 dB. Before being passed to the sound-programme circuit, therefore, the dynamic ratio of the studio output needs to be compressed.

TABLE 1/J.15

Principal characteristics of the various instruments used for monitoring the volume or peaks during telephone conversations or sound-programme transmissions

Type of instrument	Rectifier characteristic (Note 1)	Time to reach 99% of final reading (milliseconds)	Integration time (milliseconds) (Note 2)	Time to return to zero (value and definition)
(1) Vu meter (United States of America)	1.0 to 1.4	300	165 (approx.)	Equal to the integration time
(2) Vu meter (France)	1.0 to 1.4	300 ± 10%	207 ± 30	300 ms ± 10% from the reference deviation
(3) Peak programme meter, used by the Netherlands	1	Not specified	10 ms for –1 dB 5 ms for –2 dB 0-4 ms for –15 dB	0 to –20 dB: 1-5 s 0 to –40 dB: 2-5 s
(4) Programme level meter (Italy)	1	Approx. 20 ms	Approx. 1.5 ms	Approx. 1.5 ms from 100% to 10% of the reading in the steady state
(5) Peak indicator for sound-programme transmissions used by the British Broadcasting Corporation (BBC peak programme meter)	1		10 (Note 3)	3 s for the pointer to fall 26 dB
(6) Maximum amplitude indicator used by the Federal Republic of Germany (type U 21)	1	Around 80	5 (approx.)	1 or 2 s from 100% to 10% of the reading in the steady state
(7) OIRT – Programme level meter: Type A sound meter Type B sound meter		For both types: less than 300 ms for meters with pointer indication, and less than 150 ms for meters with light indication	 10 ± 5 60 ± 10	For both types: 1.5 to 2 s from the 0 dB point which is at 30% of the length of the operational section of the scale
(8) E.B.U. standard peak programme meter (Note 4)	1	–	10	2.8 s for the pointer to fall 24 dB

Note 1 – The number given in the column is the index n in the formula $V_{(output)} = [V_{(input)}]^n$ applicable for each half-cycle.

Note 2 – The "integration time" was defined by the CCIF as the "minimum period during which a sinusoidal voltage should be applied to the instrument for the pointer to reach to within 0.2 neper or nearly 2 dB of the deflection which would be obtained if the voltage were applied indefinitely". A logarithmic ratio of 2 dB corresponds to 79.5% and a ratio of 0.2 neper to 82%.

Note 3 – The figure of 4 ms, that appeared in previous editions, was actually the time taken to reach 80% of the final reading with a d.c. step applied to the rectifying integrating circuit. In a new and somewhat different design of this programme meter using transistors, the performance on programme remains substantially the same as that of earlier versions and so does the response to an arbitrary, quasi-d.c. test signal, but the integration time, as defined in Note 2, is about 20% greater at the higher meter readings.

Note 4 – This meter is intended specifically for use in monitoring sound signals transmitted internationally, and therefore incorporates a scale conforming to CCITT Recommendation N.15 [5], calibrated in dB from –12 to +12 relative to a level marked "TEST" corresponding to 0 dBm at a zero relative level point. In addition to the normal mode of operation having the characteristics shown above, the meter may be operated temporarily in a "slow" mode faciliting the comparison of observations made at widely separate points. The peak values indicated in this mode have no absolute significance, and may only be used for such comparisons.

References

[1] CCITT Recommendation *Limits for the lining-up of international sound-programme links and connections*, Vol. IV, Rec. N.10.

[2] CCITT Recommendation *Essential transmission performance objectives for international sound-programme centres (ISPC),* Vol. IV, Rec. N.11.

[3] CCITT Recommendation *Measurements to be made during the line-up period that precedes a sound-programme transmission*, Vol. IV, Rec. N.12.

[4] CCITT Recommendation *Measurements to be made by the broadcasting organizations during the preparatory period*, Vol. IV, Rec. N.13.

[5] CCITT Recommendation *Maximum permissible power during an international sound-programme transmission*, Vol. IV, Rec. N.15.

[6] CCITT Recommendation *Identification signal*, Vol. IV, Rec. N.16.

[7] CCITT Recommendation *Monitoring the transmission*, Vol. IV, Rec. N.17.

[8] CCITT Recommendation *Monitoring for charging purposes, releasing*, Vol. IV, Rec. N.18.

[9] IEC Publication 268-10A.