INTERNATIONAL TELECOMMUNICATION UNION

ITU-T P.52

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

(03/93)

TELEPHONE TRANSMISSION QUALITY
OBJECTIVE MEASURING APPARATUS

VOLUME METERS

ITU-T Recommendation P.52

(Previously “CCITT Recommendation”)

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 P.52 was revised by the ITU-T Study Group XII (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

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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 Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

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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VOLUME METERS

(amended at Helsinki, 1993)

The CCITT considers that, in order to ensure continuity with previous practice, it is not desirable to modify the specification of the volume meter of the ARAEN.

Table 1 gives the principal characteristics of various measuring devices used for monitoring the volume or peak values during telephone conversations or sound-programme transmissions.

The measurement of active speech level is defined in Recommendation P.56. Comparison of results using the active speech level meter and some meters described in this Recommendation can be found in Supplement No. 18 to Series P Recommendations.

NOTE – Descriptions of the following devices are contained in the Supplements to *White Book*, Volume V:

– ARAEN volume meter or speech voltmeter: Supplement No. 10 [1].

– Volume meter standardized in the United States of America, termed the "VU meter": Supplement No. 11 [2].

– Peak indicator used by the British Broadcasting Corporation: Supplement No. 12 [3].

– Maximum amplitude indicator Types U 21 and U 71 used in the Federal Republic of Germany: Supplement No. 13 [4].

The volume indicator, SFERT, which formerly was used in the CCITT Laboratory is described in [5].

Comparative tests with different types of volume meters

A note which appears in [6] gives some information on the results of preliminary tests conducted at the SFERT Laboratory to compare the volume indicator with different impulse indicators.

The results of comparative tests made in 1952 by the United Kingdom Post Office appear in Supplement No. 14 to Series P Recommendations [7]. Further results can be found in the *Handbook on Telephonometry*.

TABLE 1/P.52

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 3)	Time to reach 99% of final reading (milliseconds)	Integration time (milliseconds) (Note 4)	Time to return to zero (value and definition)
(1) "Speech voltmeter" United Kingdom Post Office Type 3 (S.V.3) identical to the speech power meter of the l'ÁRAEN	2	230	100 (approx.)	Equal to the integration time
(2) VU meter (United States of America) (Note 1)	1.0 to 1.4	300	165 (approx.)	Equal to the integration time
(3) Speech power meter of the "SFERT volume indicator"	2	around 400 to 650	200	Equal to the integration time
(4) Peak indicator for sound-programme transmissions used by the British Broadcasting Corporation (BBC Peak Programme Meter) (Note 2)	1		10 (Note 5)	3 seconds for the pointer to fall to 26 dB
(5) Maximum amplitude indicator used by the Federal German Republic (type U 21)	1	around 80	5 (approx.)	1 or 2 seconds from 100% to 10% of the reading in the steady state
(6) 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 seconds from the 0 dB point which is at 30% of the length of the operational section of the scale

NOTES

1 In France a meter similar to the one defined in line (2) of the Table has been standardized.

2 In the Netherlands a meter (type NRU-ON301) similar to the one defined in line (4) of the Table has been standardized.

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

4 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 a percentage of 79.5% and a ratio of 0.2 neper to a percentage of 82%.

5 The figure of 4 milliseconds 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 here defined, is about 20% greater at the higher meter readings.

6 In Italy a sound-programme meter with the following characteristics is in use:

Rectifier characteristic: 1 (Note 3).

Time to reach 99% of final reading: approx. 20 ms.

Integration time: approx. 1.5 ms.

Time to return to zero: approx. 1.5 s from 100% to 10% of the reading in the steady state.

References

[1] *ARAEN volume meter or speech voltmeter*, *White Book*, Vol. V, Supplement No. 10, ITU, Geneva, 1969.

[2] *Volume meter standardized in the United States of America, termed VU meter*, *White Book*, Vol. V, Supplement No. 11, ITU, Geneva, 1969.

[3] *Modulation meter used by the British Broadcasting Corporation*, *White Book*, Vol. V, Supplement No. 12, ITU, Geneva, 1969.

[4] *Maximum amplitude indicators, types U 21 and U 71 used in the Federal Republic of Germany*, *White Book*, Vol. V, Supplement No. 13, ITU, Geneva, 1969.

[5] *SFERT volume indicator*, *Red Book*, Vol V, Annex 18, Part 2, ITU, Geneva, 1962.

[6] CCIF *White Book*, Vol. IV, pp. 270-293, ITU, Bern, 1934.

[7] *Comparison of the readings given on conversational speech by different types of volume meter*, *White Book,* Vol. V, Supplement No. 14, ITU, Geneva, 1969.