INTERNATIONAL TELECOMMUNICATION UNION

ITU-T N.23

TELECOMMUNICATION
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MAINTENANCE OF INTERNATIONAL SOUND – PROGRAMME AND TELEVISION TRANSMISSION CIRCUITS

MAINTENANCE MEASUREMENTS TO BE MADE ON INTERNATIONAL SOUND – PROGRAMME CIRCUITS

ITU-T Recommendation N.23

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation N.23 was published in Fascicle IV.3 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 N.23

MAINTENANCE MEASUREMENTS TO BE MADE ON INTERNATIONAL SOUND-PROGRAMME CIRCUITS

1 General

In Tables 1/N.23 to 5/N.23 maintenance limits for international sound-programme circuits are specified. If these limits are exceeded, the control station[1)] for the circuit should decide the appropriate action to be taken to bring the circuit back within these limits.

2 Routine measurements

Routine measurements should be made every six months and the circuit realigned to meet the limits given in Recommendation N.21. The control station should agree with other stations, the date and time of routine measurements and the parameters to be included. It is recommended to use an automatic measuring equipment (see Recommendations O.31 [1], O.32 [2], O.33 [3]). The test procedures and frequencies to be used are detailed in Recommendation N.21. If no automatic measuring equipment is available, measurements shall normally be restricted to loss/frequency distortion and weighted noise. For the stereophonic pairs, the parameters Nos. 12, 13, 14 and 15 of Table 1/N.23 shall also be measured.

3 Release of circuit for routine measurements

Even if there is a general understanding with a renter of a permanently leased circuit on the time when routine tests are to be carried out, the SIPCO should always confirm with the renter that the circuit can be released for these tests.

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1) For the functions and responsibilities of the circuit control stations see Recommendation N.5.

TABLE 1/N.23

Limits for international 15 kHz sound-programme circuits

Item	Parameter		Unit	Limits
1	Insertion gain	Adjustement error	dB	± 0.5
		Variation during 24 h	dB	± 0.5
2	Loss/frequency distortion referred to 0.8 ou 1 kHz	0.04 to 0.125 kHz	dB	+ 0.5
			dB	– 2
		0.125 to 10 kHz	dB	± 0.5
		10 to 14 kHz	dB	+ 0.5
			dB	– 2
		14 to 15 kHz	dB	+ 0.5
			dB	–3
3	Groupe delay/frequency response referred to minimum	0.04 kHz	ms	55
		0.075 kHz	ms	24
		14 kHz	ms	8
		15 kHz	ms	12
4	Weighted noise	Idle channel	dBq0ps	– 44
		Programme-modulated	dBq0ps	– 32
5	Single tone interference level + ψ		dBm0s	–73
6	Disturbing modulation by power supply		dB	– 45
7	Total harmonic distortion	0.04 to 0.125 kHz	%	1
		0.125 to 7.5 kHz	%	0.5
8	3rd order difference tone at 0.18 kHz		%	0.5
9	Error in reconstituted frequency		Hz	± 1
10	Intelligible crosstalk ratio	0.04 kHz	dB	50
		0.5 to 5 kHz	dB	74
		15 kHz	dB	60
11	Error in amplitude/amplitude response		dB	± 0.5

TABLE 1/N.23 (*cont.*)

	Item	Parameter		Unit	Limits
Additional parameters for stereo transmission	12	Difference in gain between A and B channels	0.04 to 0.125 kHz	dB	1.5
			0.125 to 10 kHz	dB	0.8
			10 to 14 kHz	dB	1.5
			14 to 15 kHz	dB	3
	13	Phase difference between A and B channels	0.04 to 0.125 kHz	degree	30
			0.2 to 4 kHz	degree	15
			14 kHz	degree	30
			15 kHz	degree	40
	14	Intelligible crosstalk ratio A/B		dB	50
	15	Crosstalk ratio (intermodulation) A/B		dB	60

Note – The limits given in this table are applicable both for analogue and digital transmissions.

TABLE 2/N.23

Limits for international 10 kHz sound-programme circuits

Item	Parameter		Unit	Limits
1	Insertion gain	Adjustment error	dB	± 0.4
		Variation with time	dB	± 0.4
2	Loss/frequency distortion referred to 0.8 or 1 kHz	0.05 to 0.1 kHz	dB	+ 1.3
			dB	–3.3
		0.1 to 0.2 kHz	dB	+ 1.3
			dB	– 2
		0.2 to 6 kHz	dB	± 1.3
		6 to 8.5 kHz	dB	+ 1.3
			dB	–.2
		8.5 to 10 kHz	dB	+ 1.3
			dB	–3.3
3	Group delay/frequency response referred to minimum	0.05 kHz	ms	54
		0.1 kHz	ms	13
		10 kHz	ms	5.4
4	Weighted noise (Idle channel)[a]		dBq0ps	– 41
5	Single tone interference level + ψ[b]		dBm0s	– 73
6	Disturbing modulation by power supply		dB	– 47
7	Total harmonic distortion	0.05 to 0.1 kHz	%	2.3
		0.1 to 10 kHz	%	1.5
8	3rd order difference tone at 0.18 kHz		%	1.5
9	Error in reconstituted frequency		Hz	± 0.8
10	Intelligible crosstalk ratio[c]		dB	76
11	Error in amplitude/amplitude response		dB	± 0.4

[a] For circuits on carrier systems, it is not always possible, in absence of special precautions, to meet these limits (see Annex II to CCIR Recommendation 504 [4]).

[b] Or 20 dB below measured weighted noise level, whichever is higher.

[c] It is in some cases difficult or impossible to meet these limits (see § 3.8, Note 2, in Annex I to CCIR Recommendation 504 [4]).

TABLE 3/N.23

Limits for international 7 kHz sound-programme circuits

Item	Parameter		Unit	Limits
1	Insertion gain	Adjustment error	dB	± 0.4
		Variation during 24 h	dB	± 0.4
2	Loss/frequency distortion referred to 0.8 or 1 kHz	0.05 to 0.1 kHz	dB	+ 0.8
			dB	–2.3
		0.1 to 6.4 kHz	dB	± 0.8
		6.4 to 7 kHz	dB	+ 0.8
			dB	–2.3
3	Group delay/frequency response referred to minimum	0.05 kHz	ms	54
		0.1 kHz	ms	13
		6.4 kHz	ms	3.4
		7 kHz	ms	6.7
4	Weighted noise	Idle channel	dBq0ps	– 46
		Programme-modulated	dBq0ps	–34
5	Single tone interference level + ψ		dBm0s	–75
6	Disturbing modulation by power supply		dB	– 47
7	Total harmonic distortion	< 0.1 kHz	%	1.5
		0.1 to 3.5 kHz	%	1.1
8	3rd order difference tone at 0.18 kHz		%	1.1
9	Error in reconstituted frequency		Hz	± 0.8
10	Intelligible crosstalk ratio	0.05 kHz	dB	55
		0.05 to 3.2 kHz	dB	76
		7 kHz	dB	69
11	Error in amplitude/amplitude response		dB	± 0.4

Note – The limits given in this table are applicable both for analogue and digital transmissions.

TABLE 4/N.23

Limits for international 6.4 kHz sound-programme circuits

Item	Parameter		Unit	Limits
1	Insertion gain	Adjustment error	dB	± 0.4
		Variation during 24 h	dB	± 0.4
2	Loss/frequency response referred to 0.8 or 1 kHz	0.05 to 0.1 kHz	dB	+ 0.8
			dB	–2.3
		0.1 to 5 kHz	dB	± 0.8
		5 to 6.4 kHz	dB	+ 0.8
			dB	– 2.3
3	Group delay/frequency response referred to minimum	0.05 kHz	ms	54
		0.1 kHz	ms	13
		5 kHz	ms	3.4
		6.4 kHz	ms	6.7
4	Maximum weighted noise level		dBq0ps	– 41
5	Single tone interference level + ψ		dBm0s	–75
6	Disturbing modulation by power supply		dB	– 47
7	Total harmonic distortion	< 0.1 kHz	%	1.5
		> 0.1 kHz	%	1.1
8	3rd order difference tone at 0.18 kHz		%	1.1
9	Error in reconstituted frequency		Hz	± 0.8
10	Intelligible crosstalk ratio	0.05 kHz	dB	55
		00.5 to 3.2 kHz	dB	76
		6.4 kHz	dB	70
11	Error in amplitude/amplitude response		dB	± 0.4

TABLE 5/N.23

Limits for international 5 kHz sound-programme circuits

Item	Parameter		Unit	Limits
1	Insertion gain	Adjustment error	dB	± 0.4
		Variation during 24 h	dB	± 0.4
2	Loss/frequency distortion referred to 0.8 or 1 kHz	0.07 to 0.2 kHz	dB	+ 0.8
			dB	–2.3
		0.2 to 4 kHz	dB	± 0.8
		4 to 5 kHz	dB	+ 0.8
			dB	–2.3
3	Group delay/frequency response referred to minimum	0.07 kHz	ms	40
		5 kHz	ms	10
4	Maximum weighted noise level		dBq0ps	–34
5	Single tone interference level + ψ		dBm0s	–75
6	Disturbing modulation by power supply		dB	– 47
7	Total harmonic distortion	< 0.1 kHz	%	1.5
		> 0.1 kHz	%	1.1
8	3rd order difference tone at 0.18 kHz		%	1.1
9	Error in reconstituted frequency		Hz	± 0.8
10	Intelligible crosstalk ratio	0.07 kHz	dB	59
		00.5 to 3.2 kHz	dB	76
		5 kHz	dB	72
11	Error in amplitude/amplitude response		dB	± 0.4

References

[1] CCITT Recommendation *Automatic measuring equipment for sound-programme circuits*, Vol. IV, Rec. O.31.

[2 CCITT Recommendation *Automatic measuring equipment for stereophonic pairs of sound-programme circuits*, Vol. IV, Rec. O.32.

[3] CCITT Recommendation *Automatic equipment for rapidly measuring stereophonic pairs and monophonic sound-programme circuits, links and connections,* Vol. IV, Rec. O.33.

[4] CCIR Recommendation *Performance characteristics of 10 kHz type sound-programme circuits*, Vol. XII, Recommendation 504, ITU, Geneva, 1982.