

RECOMMENDATION ITU-R F.402-2*

**The preferred characteristics of a single sound channel
simultaneously transmitted with a television signal
on an analogue radio-relay system**

(1959-1963-1974-1978)

The ITU Radiocommunication Assembly,

considering

- a) that it may be desirable for economic or operational reasons to transmit the sound signal accompanying a television signal over the same radio-relay system;
- b) that a channel suitable for the transmission of the sound signal may be provided by means of a frequency modulated sub-carrier inserted in the baseband of the radio-relay system above the video-frequency band and below the continuity pilot (see Recommendation ITU-R F.401);
- c) that a sound channel provided by these means may form part of an international connection,

recommends

1 that the transmission performance of the sound channel should conform to the requirements of the ITU-T for international sound-programme circuits (Note 1);

2 that the following transmission characteristics are preferred:

		General recommen- dation	French system	USSR 625-line system
2.1	<i>Frequency of sub-carrier (MHz)</i>	7.5	10	8
2.2	<i>Modulation characteristics of sub-carrier</i>			
2.2.1	Nominal input impedance of audio channel (Ω)	600 (bal.)	15 000 (bal.)	600 (bal.)
2.2.2	Maximum audio-frequency signal at a zero relative level point (dB rel. 0.775 V r.m.s.) (Note 2)	+ 9	+ 9 (in 600 Ω)	0 (input) + 17 (output)
2.2.3	Audio-frequency bandwidth (Hz)	30-10 000 (Note 3)	40-12 000	50-10 000

* Radiocommunication Study Group 9 made editorial amendments to this Recommendation in 2001 in accordance with Resolution ITU-R 44.

2.2.4	Deviation of sub-carrier (for a sinusoidal test tone of maximum level given in § 2.2.2)	140 kHz r.m.s.	70 kHz r.m.s (at 800 kHz)	150 kHz peak
2.2.5	Pre-emphasis of audio-frequency channel (μ s) (Note 4)		50 (see Rec. ITU-R BS.450)	nil

2.3 *Deviation of IF and RF carrier*

The amplitude of the unmodulated sub-carrier should be such as to produce a deviation of the IF and RF carrier of:	300 kHz r.m.s.	600 kHz r.m.s.	750 kHz peak
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NOTE 1 – Maintenance is dealt with in ITU-T Recommendations Series N, Vol. IV, Fascicle IV.3. The conditions of measurement should be the subject of further study.

NOTE 2 – The input and output levels for an international programme line and for an international programme link have been defined in ITU-T Recommendation J.14 (Vol. III, Fascicle III.4). It is the responsibility of the administrations concerned to choose the appropriate value for their particular use.

NOTE 3 – The upper limit may be increased should there be evidence of need.

NOTE 4 – Pre-emphasis may be used by agreement between the administrations concerned. Attention is drawn to Recommendation ITU-R BS.450, § 1.2. The network defined in that Recommendation may also be suitable for the sound channel, but it should be studied to see if the nominal deviation of 800 Hz can remain at the value used for transmission without pre-emphasis, or if it is necessary to fix the nominal deviation at a higher frequency to avoid increase in the peak signal to the sub-carrier modulator.
