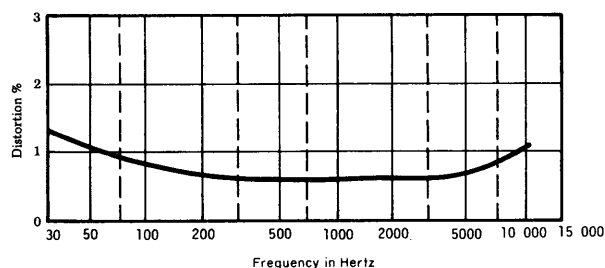


**Fig 5**  
**Monophonic Frequency Response**



**Fig 6**  
**Distortion versus Modulation Frequency**

(4) For curve *B* measurements are made with bass and treble controls turned fully on  
 (5) For curve *E* measurements are made with bass and treble controls at minimum

Significant points from the curves are:

- (1) Response from 30 to 15 000 Hz  $\pm$  X dB
- (2) Loudness compensation at 50 Hz and at 10 kHz

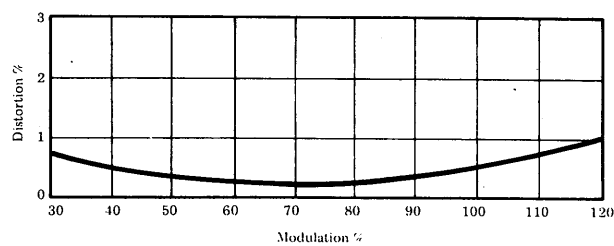
(3) Bass control range at 50 Hz, + X dB to - X dB

(4) Treble control range at 10 kHz, + X dB to - X dB

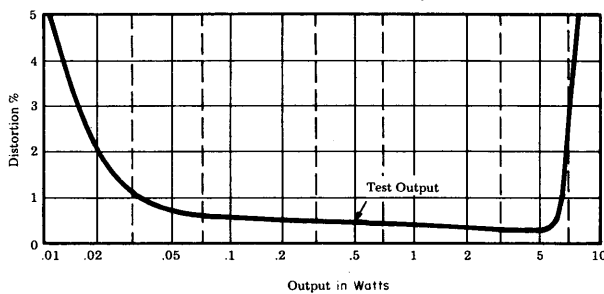
**9.1.7 Distortion versus Frequency.** See Fig 6. Curves are obtained by making the measurements given in Section 6.11.3:

(1) Record change in distortion at 50 Hz with AFC on (Section 6.19.4)

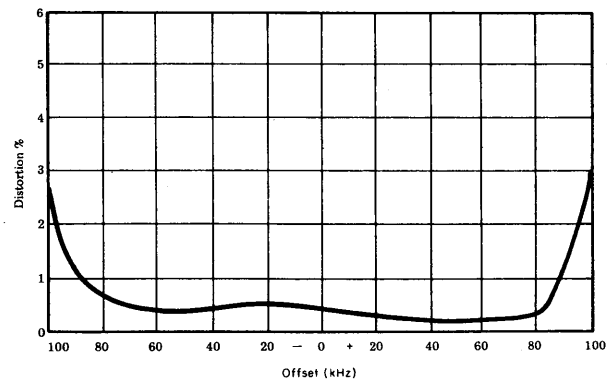
(2) Record intermodulation distortion product from 14 kHz and 15 kHz (Section 6.12)



**Fig 7**  
**Distortion versus Modulation**



**Fig 8**  
**Distortion versus Output**

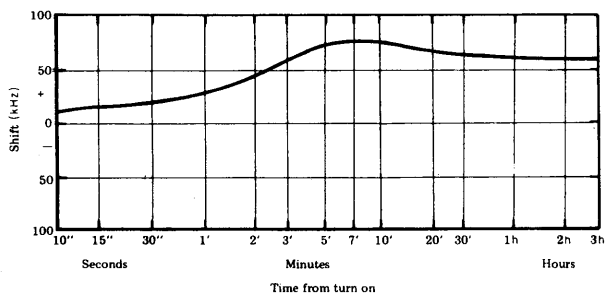


**Fig 9**  
**Distortion versus Tuning**

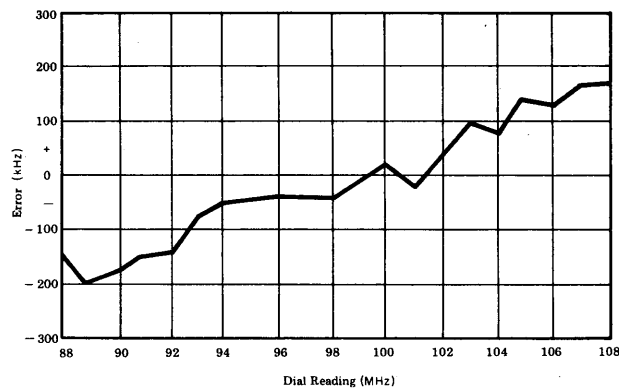
**9.1.8 Distortion versus Modulation.** See Fig 7. Curves are obtained by making the measurements given in Section 6.11.2.

**9.1.9 Distortion versus Output.** See Fig 8. Curves are obtained by making the measurements given in Section 6.11.1. The curve may be repeated for the other output channel and for other frequencies.

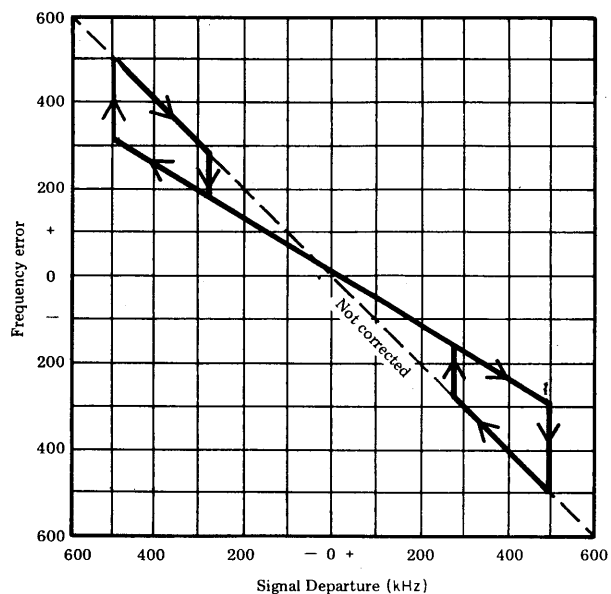
**9.1.10 Distortion versus Tuning.** See Fig 9. Measurements for curve per Section 6.11.5. Curve may be repeated at other input levels.



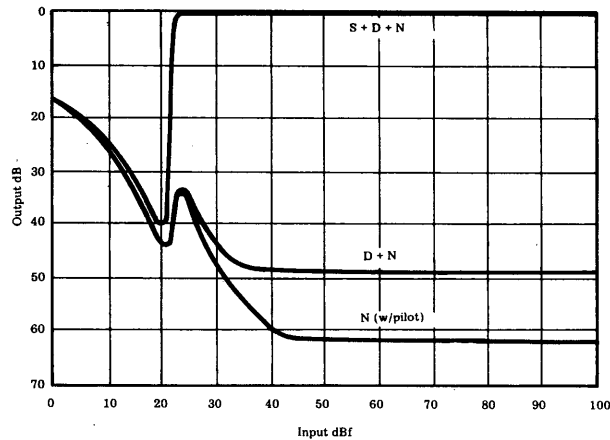
**Fig 10**  
**Frequency Drift versus Time from Turn On**



**Fig 12**  
**Dial Calibration Error**



**Fig 11**  
**AFC Characteristic**



**Fig 13**  
**Stereophonic Sensitivity Curves**

**9.1.11 Frequency Drift (Section 6.18).** See Fig 10. Curve is obtained by making the measurements given on Section 6.18(1). Record also the change in oscillator frequency for line voltage from 105 to 130 V as described in Section 6.18(3), and for input signal change from usable sensitivity to 100 dBf, as described in Section 6.18(4).

**9.1.12 AFC Performance.** See Fig 11. Curves are obtained by making the measurements given in Section 6.19.1. Record also the AFC correction factor described in Section 6.19.2 and the AFC offset error described in

Section 6.19.3. Another useful figure of merit is the ratio of the hold-in range to the pull-in range.

**9.1.13 Tuning Range and Calibration.** See Fig 12. Curves are obtained by making the measurements given in Section 6.1. Record the tuning range, also measured according to Section 6.1.

## 9.2 Stereophonic Measurements

**9.2.1 Sensitivity Curves.** See Fig 13. The measurements for these curves are like those for Fig 3, except for the use of stereophonic

**Table 5**  
**Separation versus Pilot Signal Level**

Pilot Level (percent)	Separation (dB)
15	44
12	44
10	44
7.5	30
5.0	25
2.0	20
0.5	10

NOTE: See Section 7.7.

modulation instead of monophonic, and N is measured without tone modulation, but with the pilot on. The stereo switch action is indicated by the sudden drop in output (S + D + N). The test references for the rating points are:

- (1) Usable sensitivity, Section 7.1
- (2) Muting threshold, Section 7.4
- (3) Stereo switch versus pilot, Section 7.4
- (4) Stereo switch versus modulation harmonics, Section 7.4
- (5) 50 dB quieting sensitivity, Section 7.2
- (6) Distortion at 50 dB quieting, Section 7.6.1
- (7) Distortion at 65 dBf, Section 7.6.2
- (8) Signal-to-noise ratio at 65 dBf, Section 7.3

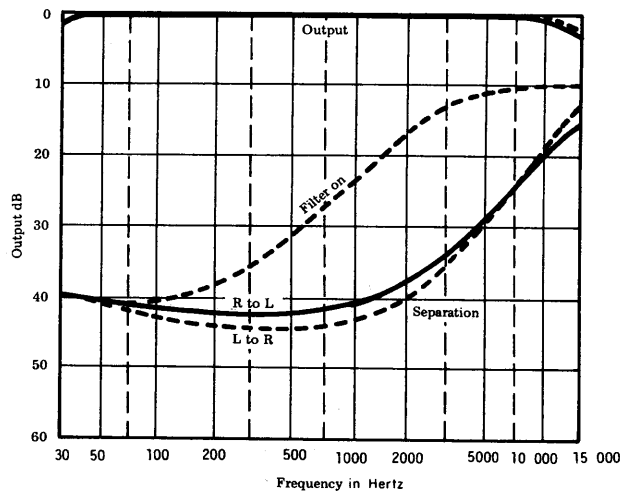
A supplementary test is the stereo indicator threshold, that is, the minimum input for useful indication of stereo reception.

**9.2.2 Frequency Response and Separation.** See Fig 14. Frequency curves are obtained by making the measurements given in Section 7.5. Record variation from 1 kHz output as 30 to 15 000 Hz  $\pm$  X dB. Use the measurements for separation versus frequency curves described in Section 7.7. Record minimum separation at 1 kHz, 100 Hz, and 10 kHz. Record also the effect on separation when the stereo noise filter is turned on. See Table 5.

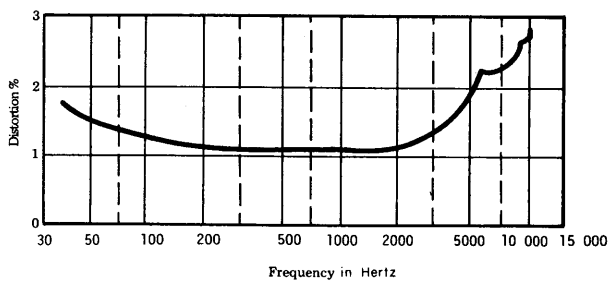
**9.2.3 Distortion versus Modulation Frequency (Section 7.6.3).** See Fig 15. Curves are obtained by making the measurements given in Section 7.6.3. Record the IM resulting from modulation frequencies at subharmonics of 18 kHz and 20 kHz.

**9.2.4 Ultrasonic Interference.** To obtain values for ultrasonic interference:

- (1) Record the subcarrier products rejection as described in Section 7.9



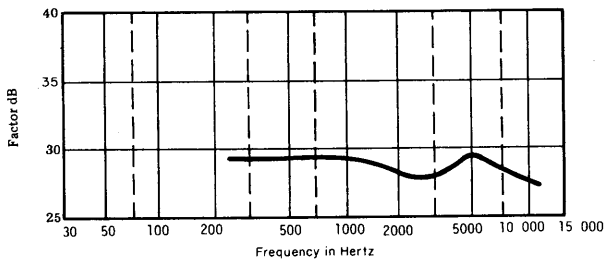
**Fig 14**  
**Frequency Response and Separation versus Frequency**



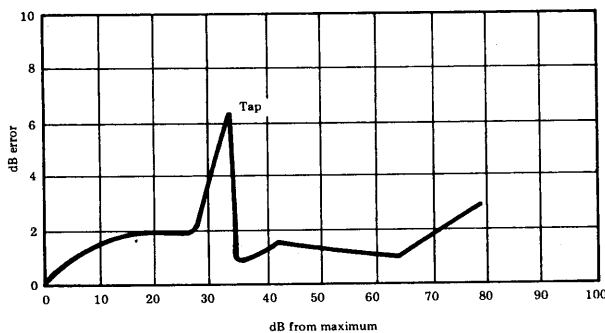
**Fig 15**  
**Distortion versus Modulation Frequency**

- (2) Record the SCA rejection as described in Section 7.10.

**9.2.5 Identicality.** See Figs 16 and 17. Curves are obtained by making the measurements given in Section 7.8.



**Fig 16**  
**Identity Factor versus**  
**Modulation Frequency**



**Fig 17**  
**Control Tracking Error**

## 10. References<sup>1</sup>

### 10.1 General

- [1] Federal Communications Commission, *Rules and Regulations*, vol III, pt 73, Radio Broadcast Services, Subpart B, FM Broadcast Stations
- [2] IEC Publication 91 (1968), Recommended Methods of Measurement of Receivers for Frequency Modulation Broadcast Transmissions
- [3] IEC Publication 315, Methods of Measurement on Radio Receivers for Various Classes of Emission: Part 1 — General Conditions for Measurements and Measuring Methods Applying to Sev-

<sup>1</sup>IEC standards are available from The American National Standards Institute, 1430 Broadway, New York, NY 10018. IHF standards are available from the Institute of High Fidelity, 516 Fifth Avenue, New York, NY. EIA standards are available from The Electronic Industries Association, 2001 Eye Street NW, Washington, DC, 20006.

eral Types of Receivers, (1970); Part 4 — Radio Frequency Measurements on Frequency Modulation Receivers, in preparation; Part 5 — Specialized Radio-Frequency Measurements. Measurements on Frequency Modulated Receivers of the Response to Impulsive Interference, (1971)

- [4] IEEE Std 190-1960 (ANSI C16.13-1961), Methods of Testing Monochrome Television Broadcast Receivers
- [5] IHF Std IHFM-T-100 (1958) and Addendum 1 (1959), Standard Methods of Measurement for Tuners

### 10.2 Acoustic and Audio Amplifier Measurements

- [6] EIA Std RS-234-C (1971), Standard Methods of Measurement for Audio Amplifiers Used in Home Equipment
- [7] IEC Publication 315, Methods of Measurement on Radio Receivers for Various Classes of Emission: Part 2 — Measurements Particularly Related to the Audio-Frequency Part of a Receiver, 1971
- [8] IEC Publication 268-5 (1972) (ANSI S1.5-1971), Sound System Equipment: Part 5 — Loudspeakers
- [9] IHF Std IHFM-A-201, (1966), Standard Methods of Measurement for Audio Amplifiers
- [10] IEEE Std 219-1961, Recommended Practice for Loudspeaker Measurements
- [11] Federal Trade Commission, *Trade Regulation Rule, Power Output Claims for Amplifiers Utilized in Home Entertainment Products*, effective November 4, 1974

### 10.3 Radiation and Power Line Conducted Measurements

- [12] Federal Communications Commission, *Rules and Regulations*, vol II, pt 15, Radio Frequency Devices, Subpart C, Radio Receivers, particularly Sections 15.61, 15.63, 15.69 through 15.72, 15.75, and 15.82
- [13] IEC Publication 106 (1959) and 106A (1962), Methods of Measuring Radiation
- [14] IEEE Std 187-1951, Open Field Method of Measurement of Spurious Radiation

- from Frequency Modulation and Television Broadcast Receivers
- [15] IEEE Std 213-1961, Methods of Measurement of Radio Interference: Conducted Interference Output to the Power Line from FM and Television Broadcast Receivers in the Range of 300 kHz to 25 MHz
  - [16] EIA Publication RS-378 (1970), Measurement of Spurious Radiation from FM and TV Broadcast receivers in the Frequency Range of 100 to 1000 MHz, Using the EIA-Laurel Broad-Band Antenna
  - [17] EIA Consumer Products Bulletin Number 4 (1971), Standard Form for Reporting Measurements of TV and FM Broadcast Radio Receivers in Compliance with FCC Part 15-Rules