Equipment profiles

Sony Model STR-6800SD Stereo AM/FM Receiver

MANUFACTURER'S SPECIFICATIONS

FM Tuner Section
Usable Sensitivity: Mono, 1.7 μV (9.8 dBf).
50 dB Quieting: Mono, 3.5 μV (16.1 dBf); Stereo, 45 μV (38.3 dBf).
S/N: Mono, 73 dB; stereo, 68 dB.
Frequency Response: 30 Hz to 15 kHz, +0.2, -1.5 dB.
Capture Ratio: 1.0 dB.
AM Suppression: 54 dB.
I.F. and Spurious Rejection: 100 dB.
Image Rejection: 75 dB.
THD: Mono, 0.2 per cent @ 1 kHz, 100 Hz, and 10 kHz; Stereo, 0.3 per cent @ 1 kHz & 100 Hz, 0.6 per cent @ 10 kHz.
Stereo Separation: 40 dB @ 1 kHz, 35 dB @ 100 Hz & 10 kHz.
Sub-Carrier & SCA Rejection: 60 dB.
Muting Threshold: 5μV (19.2 dBf).

AM Tuner Section
Usable Sensitivity: 250 μV/M (internal antenna).
S/N: 50 dB.
Selectivity: 35 dB.
Image Rejection: 40 dB.
I.F. Rejection: 35 dB.
THD: 0.5 per cent.

Amplifier Section
Power Output: 80 watts per channel continuous, 8 ohms, 20 Hz to 20 kHz.
Rated THD: 0.15 per cent.
Rated IMD: 0.15 per cent.
Damping Factor: 40.
Frequency Response: Phono, RIAA ±0.5 dB, High Level, 10 Hz to 30 kHz, +0, -2 dB.
Input Sensitivity: Phono, 2.5 mV; High Level, 250 mV.
S/N Ratio: Phono, 72 dB "A" Weighted; High Level, 90 dB "A" Weighted.
Bass & Treble Control Range: ±10 dB @ 100 Hz and 10 kHz.
Filters: 6 dB/octave above 5 kHz or 10 kHz, and below 50 Hz or 25 Hz.

General Specifications
Power Requirements: 120 V, 60 Hz, 225 watts.
Dimensions: 19¼ in. (48.9 cm) W x 6 9/16 (16.67 cm) H x 16¼ in. (41.2 cm) D.
Weight: 36 lb., 7 oz. (16.52 kg).
Price: $600.00

Sony's Model STR-6800SD receiver is the highest powered of the three units introduced recently by that company. The receiver represents quite a styling departure for Sony, resembling neither that company's earlier receivers nor most of today's competitive units. Control layout may take a bit of getting used to, in that on first impression, things seem to be a bit upside down, but upon closer examination and use, one quickly discovers that the control layout of this receiver has been very logically organized for ease of use.

At the upper right side of the unit are the two most frequently used rotary knobs, the tuning knob and the master volume control. The latter control is calibrated in dB, and adjacent to it is a -20 dB audio muting switch. At the upper left are a rectangular power *On/Off* pushbutton switch and signal-strength/multipath and center-of-channel meters. Two indicator lights near the center-tuning meter denote Dolby FM selection and stereo FM reception.

The long dial scale opening, framed in a dark color, is centered on the panel, and FM calibration marks occur at every 100 kHz in linear fashion. Controls just to the right of the dial area include a tape-copy selector (with positions for copying from one tape deck to another, while at the same time listening to any other program source), a tape monitor selector for either of the two tape monitor circuits, and a program selector switch with settings for two phono inputs, FM, AM, or AUX.

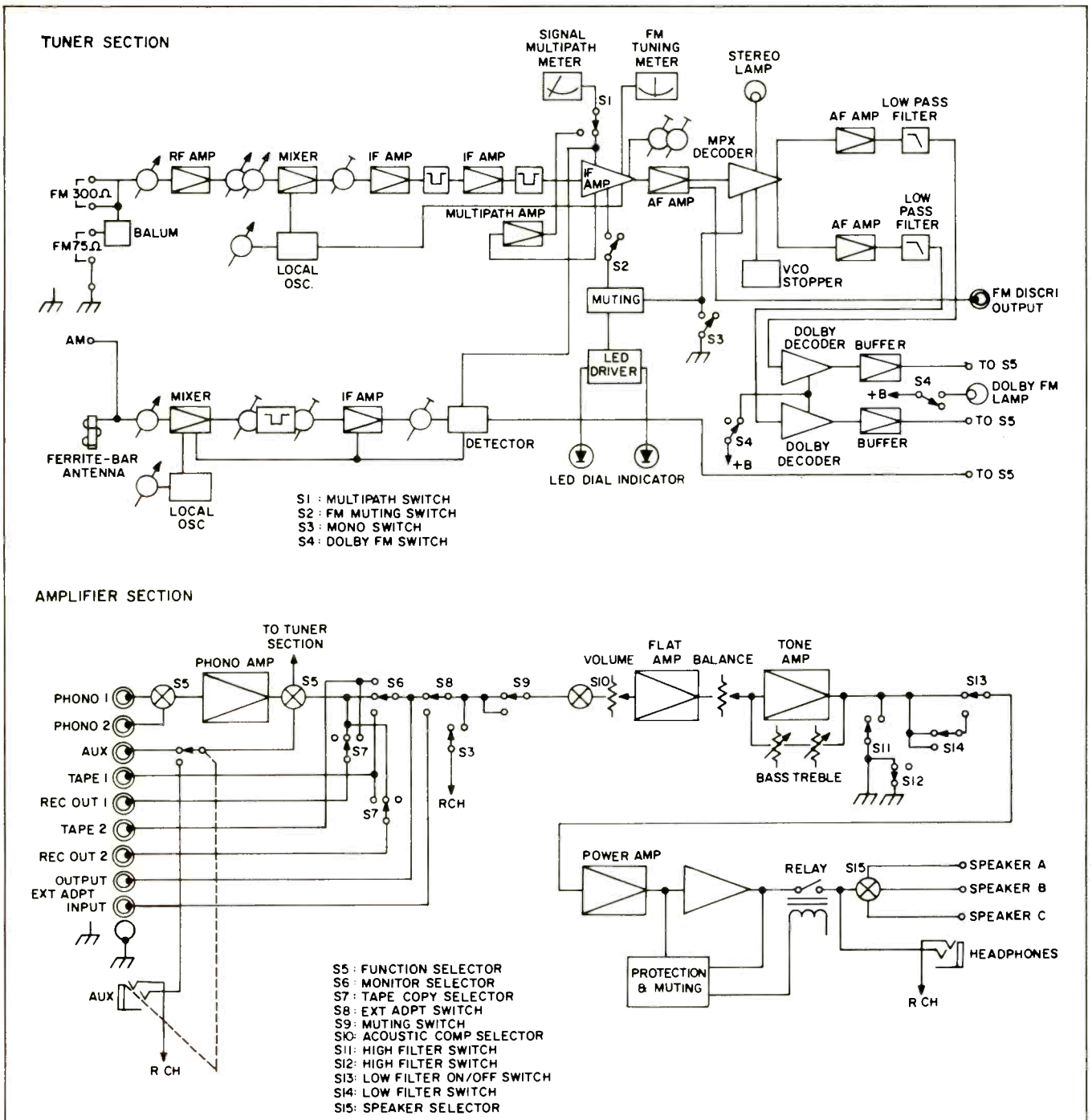


Fig. 1—Block diagram of the tuner section and the amplifier section of the Sony STR-6800SD.

The lower portion of the panel contains a headphone jack, speaker selector switch (three pairs can be connected, of which any one or two pairs can be switched on), four high and low cut filter buttons (providing two cut-off points for each filter), concentrically mounted bass and treble controls for individual channel adjustment, a balance control, and a new control which Sony calls an *Acoustic Compensator Selector*. When set to "low," this control introduces bass boost by a fixed amount. In the "presence" position, mid-range frequencies are boosted, while in the "loudness" position, conventional loudness compensation is introduced. Push-button switches at the lower right handle FM muting, Dolby *On/Off* (the receiver has built in Dolby decoding circuitry plus automatic switching from 25 μS to 75 μS de-emphasis), switching of the signal meter to multipath indication, mono/stereo selection, and external adaptor selection (a third circuit interruption point like the tape monitor circuits). A stereo phone jack duplicates the AUX inputs on the rear panel, and connection to it of an auxiliary source gives it priority over the rear panel AUX jacks.

The rear panel of the STR-6800SD has three sets of speaker terminals located at the right, along with three unswitched a.c. receptacles. Speaker connections are of the spring-loaded "key" type which accept the stripped ends of the speaker cables. Screw terminals for external AM and 300-ohm FM antennas are provided, as is a 75-ohm coaxial con-

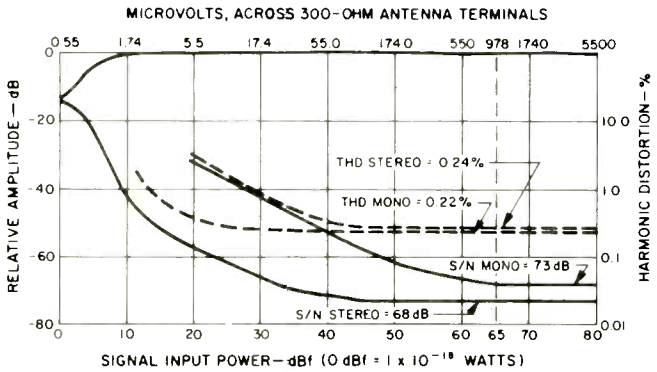


Fig. 2—FM mono and stereo quieting and distortion characteristics.

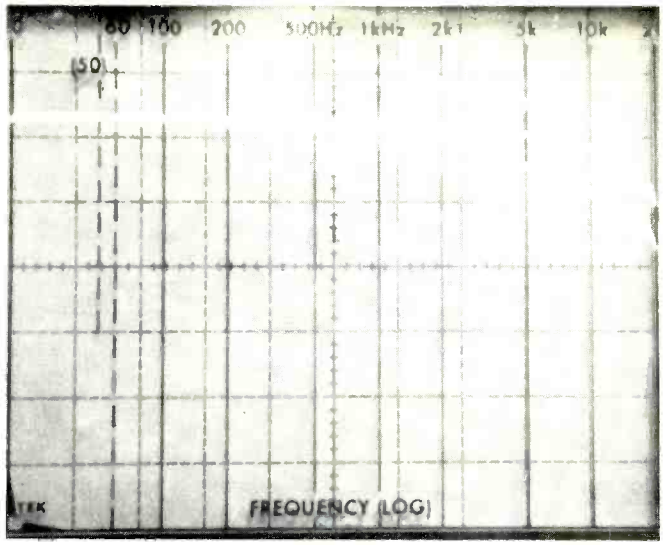


Fig. 4—The 25 microsecond (upper trace) and 75 microsecond de-emphasis characteristics.

nector. The standard AM ferrite bar antenna has been positioned below the antenna input and tape out terminals so that the legends associated with the various output and input jacks remain visible at all times. A separate ground terminal as well as an FM discriminator output jack are also provided on the rear panel.

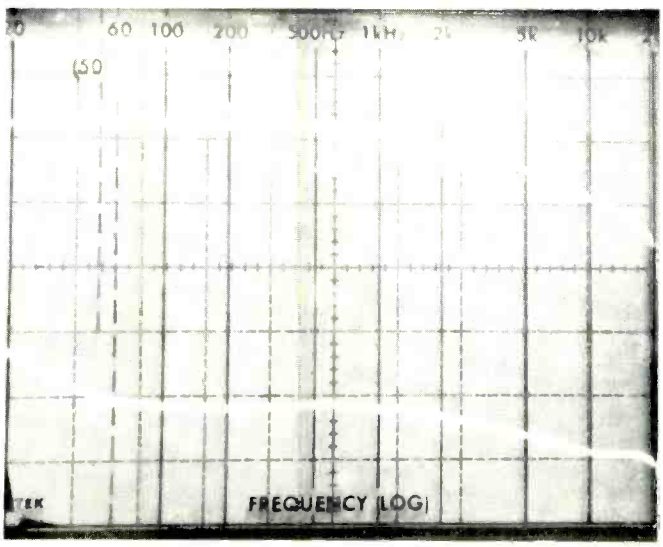
We can remember when Sony used to go to a fair amount of trouble to give a rather complete description of the circuitry used in their products as part of the owner's manual. However, the company has not kept up this practice, and we weren't supplied a schematic diagram with our test sample. Owners can no doubt obtain a complete service manual from the company, but presently we can only reproduce the two sections of the overall receiver block diagram that were provided. These are shown in Figs. 1(a), (b).

FM Tuner Section Measurements

Signal-to-noise ratio and distortion characteristics are plotted as a function of the input signal strength in Fig. 2. (*NOTE:* Our presentation of these curves has been modified to emphasize the new dBf signal strength notations used in the recently adopted IHF/IEEE Tuner Measurement Standards. This makes for a linear graphic layout, both in the horizontal and vertical axes. Equivalent "microvolt" notations, referenced to a 300-ohm antenna impedance, are shown for key dBf values to assist those who have not yet become accustomed to the new dBf values). Usable sensitivity in mono measured 1.7 μV (9.8 dBf), while in stereo it measured 5.0 μV (19.2 dBf). The 50-dB quieting point in mono was achieved with a signal input of 2.5 μV (13.2 dBf), with 42.0 μV (37.3 dBf) being required for the same quieting in stereo. S/N at 65 dBf measured 73 dB for mono and 68 dB for stereo, exactly as claimed. THD in mono and stereo were almost identical, with readings of 0.22 per cent and 0.24 per cent respectively. Selectivity measured 80 dB, while the various rejection capabilities all measured within a dB or two of published claims. Capture ratio measured 1.0 dB exactly. Figure 3 is a spectrum analyzer plot of separation versus frequency. Separation at 1 kHz measured 44 dB. Figure 4 shows the two de-emphasis characteristics of the FM tuner section (upper trace is 25 microsecond response, used in Dolby setting), while in Fig. 5 we have plotted distortion versus frequency for both mono and stereo FM.

Stereo switching threshold measured 4.5 μV (18.3 dBf), a perfectly reasonable value in view of the usable stereo sensitivity figure previously noted. Muting threshold measured exactly 5 μV (19.2 dBf) as claimed. Sub-carrier rejection was 62 dB, somewhat better than claimed. Overall frequency response deviated from flat by no more than 0.5 dB, even at the 15 kHz frequency extreme.

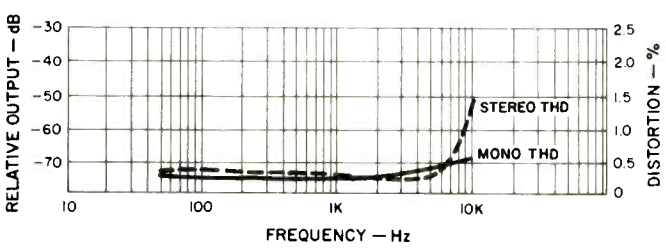
Fig. 3—Stereo FM separation (includes the 75 microsecond de-emphasis).



Amplifier Section Measurements

The power amplifier section of the STR-6800SD delivered 96 watts per channel of continuous power for the rated THD figure of 0.15 per cent (99.0 watts per channel for 0.15 per cent IM distortion), while at all lower power levels, THD and IM were considerably lower, as plotted in Fig. 6. At the

Fig. 5—FM Distortion vs. frequency.



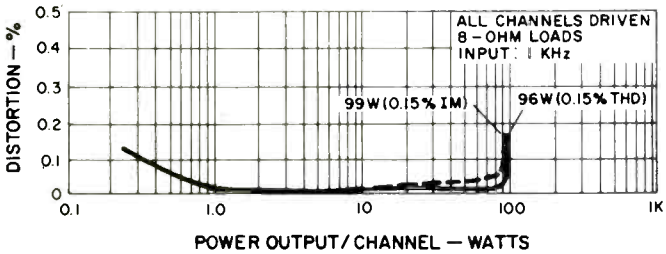


Fig. 6—Harmonic and intermodulation distortion characteristics.

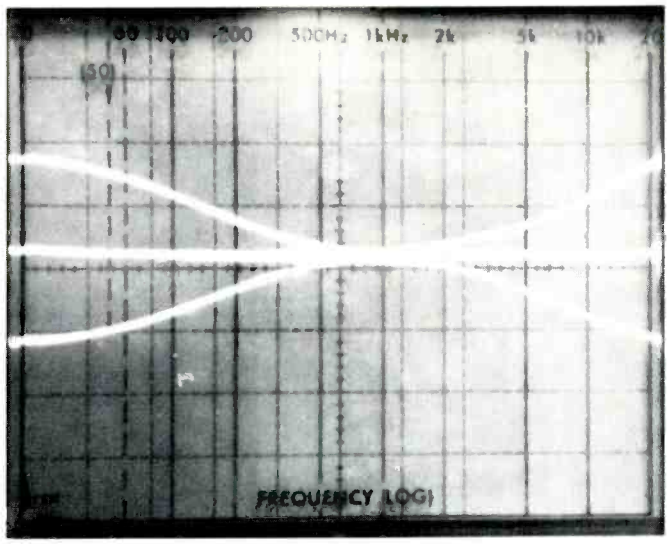


Fig. 8—Bass and treble range with the Sony STR-6800SD.

1-watt output level, THD was 0.018 per cent, while IM measured 0.015 per cent. At rated output (80 watts per channel, 8 ohm loads), THD measured 0.014 per cent for a 1-kHz test signal, while IM measured 0.044 per cent. Full power band (frequency extremes at which 80 watts per channel was obtainable with no more than 0.15 per cent THD) extended from below 10 Hz to 26 kHz. Our particular sample would have met its FTC power test even if the unit has been rated at 92 watts per channel instead of the conservative 80 watts. A plot of distortion versus frequency, taken at the 80-watt per channel level, is shown in Fig. 7.

Phono input sensitivity measured 2.6 millivolts for full power output, while high level input sensitivity was 250 mV, exactly as specified. Phono overload, using a 1-kHz test signal, occurred at an input level of 90 millivolts — a bit on the low side compared to some other high quality receivers we have measured recently, but still adequate for use with most cartridges when they are reproducing heavily modulated disc grooves. Unweighted hum and noise in both phono inputs measured 70 dB, while in the high level positions, hum and noise was a high 92 dB. Overall frequency response in phono was within 0.7 dB of the prescribed RIAA playback curve from 30 Hz to 15 kHz, while in high level service, frequency response was flat to within 1.0 dB from below 10 Hz to 25 kHz (-3 dB at 45 kHz).

Range of bass and treble tone controls is depicted in the spectrum analyzer sweeps of Fig. 8, while the action of the "presence" setting of the acoustic compensator switch is plotted (compared with a flat response reference) in Fig. 9. Note that in Fig. 9, the vertical scale of the 'scope presentation has been magnified so that one vertical division equals 2 dB as opposed to the usual 10 dB per box used in Figs. 8, 10, and 11. Thus, the presence "bump" is approximately 3 dB high at its peak between 1 and 2 kHz. The "low boost" setting of the acoustic compensator switch really duplicates the low end of the loudness control function and is dependent upon the relative master volume control settings. In Fig. 10, we compared the action of the "low boost" setting with that of the more familiar "loudness" setting, in which both low and high frequencies are emphasized at the -30 dB point on the master volume control.

Low and high filter cut responses are plotted, by means of the spectrum analyzer sweeps, in Fig. 11. While cutoff slopes are only 6 dB per octave, Sony has taken care to set the cutoff points sufficiently far away from important mid-range frequencies to make the filters moderately effective in reducing hiss and rumble without interfering too much with musical content.

Use and Listening Tests

Figured purely on a dollars-per-watt basis, the Sony STR-6800SD offers unusually good value for its price. Consider, too, that the built-in Dolby feature alone is worth around $100.00 if purchased as a separate add-on accessory. Considering the extra control features such as those two-position

Fig. 7—Distortion vs. frequency.

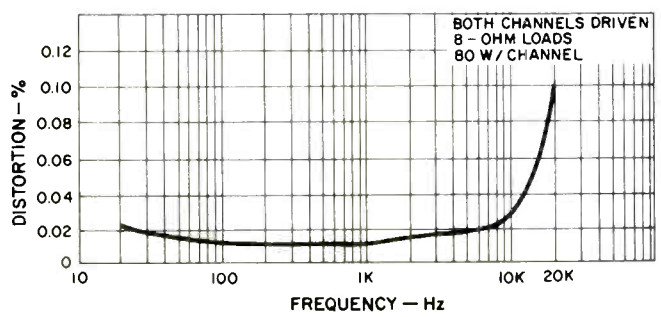
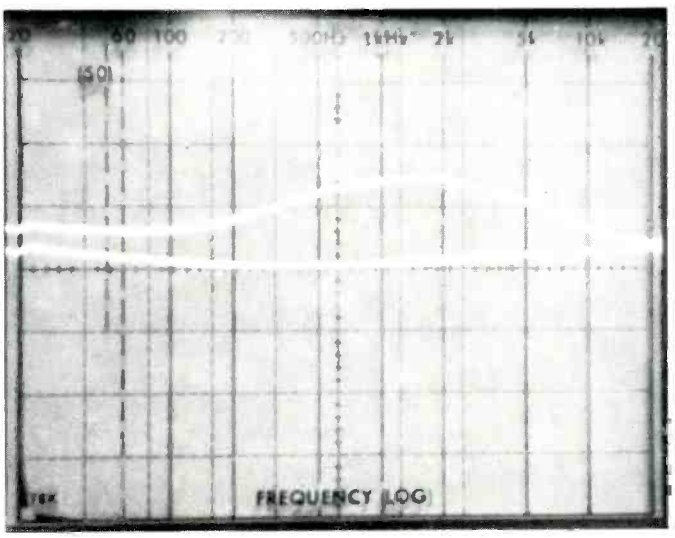


Fig. 9—The "presence" setting response. (*Note:* the vertical scale is altered to 2 dB per division in this graph.)



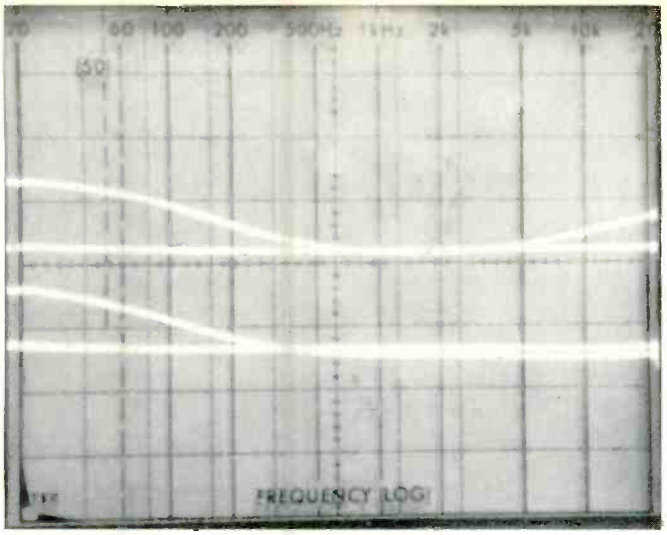


Fig. 10—The "low boost" setting is similar to "loudness" except the treble emphasis is omitted.

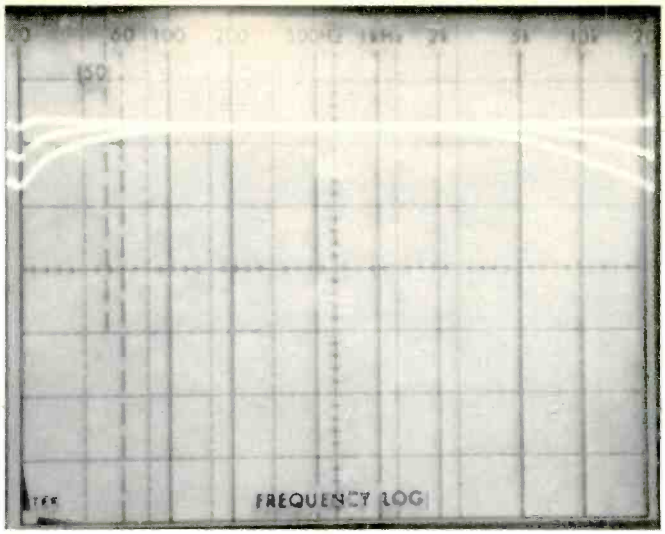


Fig. 11—Low- and high-cut filter responses.

high and low cut filters, the unique acoustic compensator feature, the intelligent control layout, and the conservative, cool-running amplifier circuitry, the receiver's inherent worth increases still further.

In our listening tests, the receiver was connected to a pair of low-efficiency bookshelf-type speakers, to which it provided both solid and ample power. Dial calibration was virtually perfect — no small feat when you consider the precise markings on the expanded dial scale. The alternate use of the signal-strength meter as a multipath indicator is very worthwhile and it worked extremely effectively for us. AM circuitry is a bit on the minimal side and not consistent with the quality of the rest of the receiver — but then this is true of so many high fidelity receivers that it almost need not be mentioned. In using the receiver for recording purposes, we were not bothered in the least by any sub-carrier product beats — so effectively has Sony managed to suppress such output products without sacrificing good FM frequency response in stereo. All in all, it appears that Sony's revamped receiver line involves much more than just a new front panel layout and, in the case of their highest power receiver at least, the company has managed to deliver an outstanding value for a very reasonable price. *Leonard Feldman*

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