

**Pioneer Model
SX-1500T
AM/FM Stereo Receiver**



MANUFACTURER'S SPECIFICATIONS—
FM Section: IHF Sensitivity: 1.7 μ V. Image Rejection: 76 dB (@ 98 MHz). Signal-to-Noise: 65 dB. Capture Ratio: 1 dB. Stereo Separation: 37 dB (@ 1 kHz). **AM Section:** IHF Sensitivity: 20 μ V. Image Rejection: 60 dB (@ 1 MHz). **Amplifier Section:** Music Power (total): 170 watts @ 4 ohms. 140 watts @ 8 ohms. RMS Power (per channel): 60 watts @ 4 ohms. 55 watts @ 8 ohms. Harmonic Distortion: Less than 0.5% at rated output (1 kHz). Frequency Response: 20 Hz to 70 kHz \pm 1 dB. Power Bandwidth: 20 Hz to 70 kHz. Hum and Noise: Tape Head: better than 75 dB. Mag. In.: better than 80 dB. Aux. In: better than 90 dB. Damping Factor: 25 @ 8 ohms, 1 kHz. Tone Controls: Bass +12 dB, -14 dB @ 50 Hz; Treble +10 dB, -11.5 dB @ 10 kHz. Filter Action: Low: -6 dB @ 50 Hz. High: -10 dB @ 10 kHz. General: Dimensions: 16 $\frac{1}{16}$ in. W x 5 $\frac{1}{2}$ in. H x 13 $\frac{3}{4}$ in. D. Price: \$360.00 (Including Metal Cover and Walnut-Finish side panels).

Among the better, high-powered crop of receivers offered to the stereo component purchaser this year is the Pioneer Model SX-1500T. It is equipped with just about every control one might expect to find on separate amplifiers or preamplifiers.

The unit is well-styled, sporting a light gold and black anodized heavy front panel, a walnut-colored metal cover and two walnut-finished side panels, all of which combine to give the unit a trim, modern look. The upper portion of the panel contains the tuning dial area, including the usual stereo indicator light and a peak-reading tuning meter. A 0-100 logging scale serves to divide the upper FM scale from the AM scale beneath it. Calibration markings are not pinpointed, however (while numerals appear for every 2 MHz of FM dial spread, no definitive marking point for each numeral is present). One can use the logging scale, of course.

To the right of the tuning dial area are the flywheel-mounted tuning knob (not quite velvet smooth, but satisfactory nonetheless) and the main

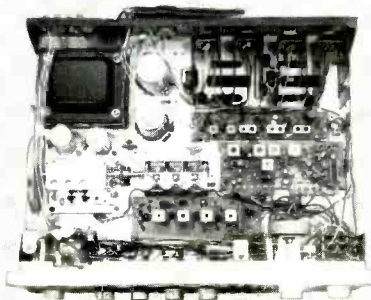
function selector switch. Besides the expected positions of this switch, such as AM, FM MONO, FM AUTOMATIC STEREO, PHONO, and AUX, there are two very welcome ones — tape-head positions equalized for either 7 $\frac{1}{2}$ ips or 3 $\frac{3}{4}$ ips for direct playback from a tape transport. Few receivers, let alone amplifiers or preamplifiers, provide this option and, we might add, both of these positions *do* offer correctly equalized (NAB) response within 1 dB from 30 Hz to 18,000 Hz.

The lower portion of the panel, starting at the left, contains a speaker selector switch (main, extra, both, and speakers "off") which, in its counter-clockwise position, turns off all power to the unit. Bass and treble controls are of the dual concentric type, with clutch action for left and right channels.

These are followed by conventional balance and volume controls. Secondary functions are controlled by means of six small, elegant lever switches. These functions include loudness contour, low filter, high filter, muting, AFC, and a "Phono-Phono 2" switch to

Fig. 2 (upper)—Rear panel layout of the Receiver.

Fig. 3 (lower) — The top-of-the-chassis view shows the clean construction of the Pioneer unit.



enable the user to have, say, a turntable and a record changer connected to the equipment simultaneously. Again, this last is a feature not normally found on all-in-one receivers. The usual phono jack and a rotary six-position "mode & tape monitor" switch completes the layout of the front panel. Why six positions for "tape monitoring"? To enable you to either *listen* to left, right, or stereo channels through both speakers or to *monitor* left, right, or both channels from a "three-headed" tape recorder. Figure 1 illustrates the front of this receiver.

Besides the usual input and recorder output jacks, the rear panel is equipped with two a.c. convenience outlets, the necessary antenna and ground terminals, the fuse post (as well as the voltage selector in the case of the SX-1500TF model, which features selectable voltages from 110 V to 240 V) and a loop-stick AM antenna, movable for best AM reception. Speaker connection is unique. There are four *polarized* two-prong receptacles, one for main speaker connection and one for extra speaker connection. Four two-prong plugs are supplied separately, to which speaker leads can be connected under the heads of screws in the usual fashion. These plugs are then inserted in the appropriate sockets. This has the advantage that once you have properly wired the speakers to the plugs for correct phasing, speaker systems may be disconnected at any future time (for moving, cleaning, etc.) and, when reconnected, phasing will always be correct, thanks to the polarized plug and jack combinations.

The rear panel layout is shown in Fig. 2, while Fig. 3 is a close-up view of the chassis surface, showing the separate AM and FM front ends, as well as three of the *eight* P.C. boards which go to make up this unit. The four power output transistors are mounted on large, heavy heat sinks to which are affixed heat-sensitive thermistors for bias stabilization of the output circuits. Electronic switching in the power supply further protects the output transistors from inadvertent shorting of speaker leads and other excessive current loads. In all, this husky receiver contains 4 integrated circuits (IC's), all in the FM i.f. strip, 1 FET (in the FM front end or r.f. section), 39 transistors and 29 diodes.

Performance

Measured performance was generally excellent, adhering quite closely to published specifications. Referring to

Equipment Profiles (continued)

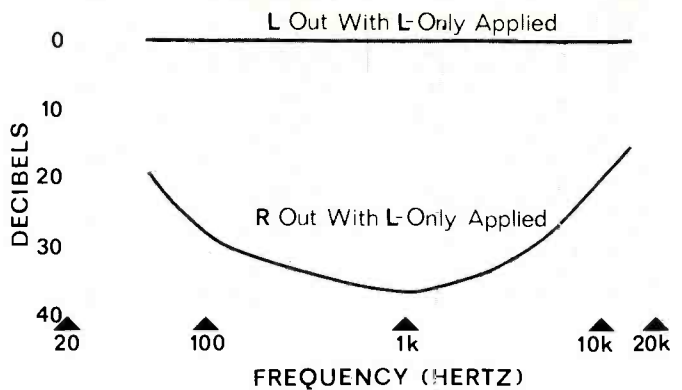
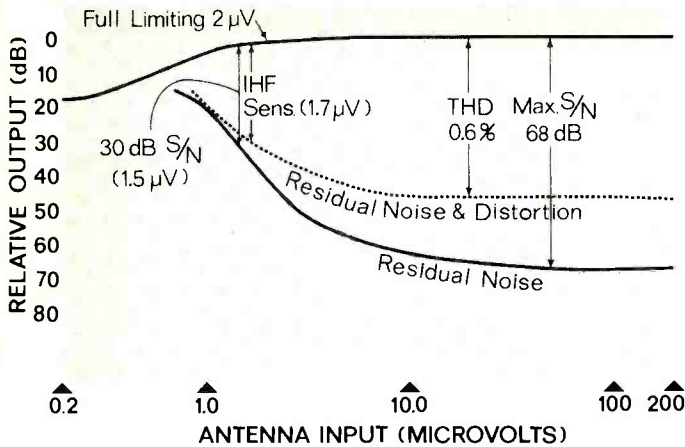


Fig. 4—FM performance characteristics of the SX-1500T.

Fig. 5—Stereo separation characteristics of the Pioneer receiver.

Fig. 6—IM and THD characteristics. Note minimal distortion at low power output, indicating virtual absence of crossover distortion.

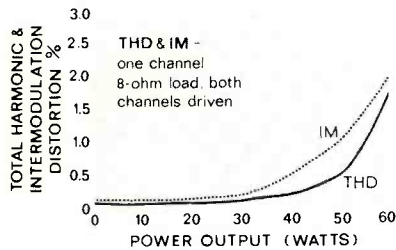


Fig. 7—Power-bandwidth curve shows excellent performance.

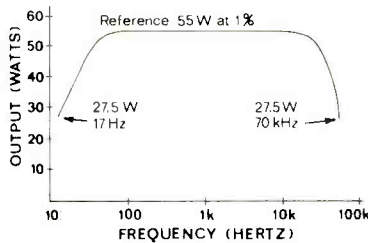
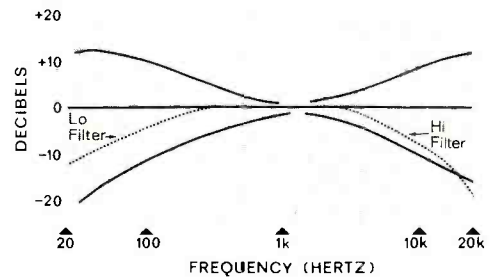


Fig. 8—Tone-control and HI and LO filter characteristics.



From Fig. 4, you can see that FM IHF sensitivity was exactly $1.7 \mu\text{V}$, as specified. Ultimate S/N ratio was 68 dB in FM, as compared with a claim of 65 dB. Total harmonic distortion at 75-kHz deviation was a mere 0.6%. In stereo FM, for equivalent modulation, distortion measured 0.9%, after eliminating residual 38 kHz and its harmonics. These residual signals were down some 36 dB at the tape output, a figure that could stand some improvement. The use of IC's in the IF strip provides excellent limiting (within 1 dB of full output at only $2 \mu\text{V}$), while the FET in the r.f. section accounts for the very excellent image rejection observed as well as the almost complete absence of measurable cross-modulation. As for stereo FM performance, switching from mono to stereo was accomplished with no accompanying clicks or noise bursts. Stereo separation, as shown in Fig. 5, was 37 dB at 1 kHz and no worse than 20 dB at any frequency from 50 Hz to 10 kHz.

As for audio performance, we measured 52 watts rms per channel at a THD of 0.5%, only a fraction short of the 55 watts spec. In any event, we were able to pump 55 watts out per channel at a total distortion of only

1%, as shown in Fig. 6. IM distortion was 1% for 50 watts rms per channel output, and only 2% at a whopping 60 watts out.

The engineers at Pioneer must belong to the "wide-band" response school for, although we suspected that the Power Bandwidth published specification might be a misprint, it actually *does* extend from 17 Hz (they claim only 20 Hz) to 70 kHz! You'll never lack for "highs" with this one! Power Bandwidth is plotted in Fig. 7.

Tone control range is as shown in Fig. 8. Also in the same figure are the "cut" characteristics of the low- and high-filters. These filters have pretty much the same slope as the tone controls (about 6 dB/octave) even though the crossover points are a bit lower and higher, respectively. Had they been designed with a 12 dB/octave slope, they might have proved more useful. With tone controls set for flat response and no filters in the circuit, one can sense the smoothness of response and excellent transient attack characteristics of this receiver. We borrowed an extra pair of low-efficiency, high-quality bookshelf speakers (in addition to the main pair) to see what 55 watts can do, and we can report that this amount

of power was more than adequate for driving *four* low-efficiency speakers. The sound remained clean from the lowest level to "3 o'clock" on the volume control.

With a sensitivity of $1.7 \mu\text{V}$ on FM, it goes without saying that we pulled in just about every mono and stereo station from "fringe" and locally. The muting was effective between stations and added no distortion on marginally received signals. Level balance between AM, FM, and Phono was very good, but Tape Head inputs had a bit more gain, so volume had to be lowered when switching to this service. There is a separation control on the rear panel which has been factory preset and customers are warned not to change the setting (so why make it accessible?), but aside from this paradox, controls handle well, are smooth to the touch and very functionally arranged.

If you crave lots of power and don't want to get involved with separate preamp-amps and tuners, the Pioneer SX-1500T AM/FM stereo receiver certainly has enough power and enough true component features to make it very worthy of consideration at its remarkably low price of \$360.00.

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