

tates with the turntable, and an automatic spindle that simply drops into the turntable center hole. It supports (and drops, quite gently) a stack of up to six records of the same size and speed. The automatic spindle must be lifted out to remove records from the turntable.

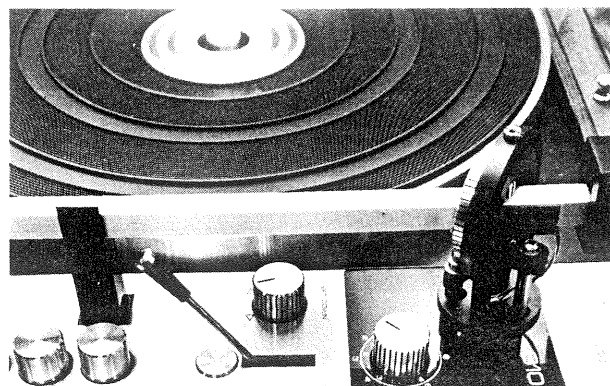
In the single-play mode, the 810 can also be used manually. Pressing the **MANUAL** button starts the turntable rotating, and the pickup can be lowered to the record either manually or with the cueing system. The cueing action is smooth and damped during lift as well as descent. The BSR 810 has a unique, effective automatic arm lock. A few seconds after the arm returns to its rest, it is automatically locked in place to prevent accidental damage to the stylus or a record. Moving the cueing lever disengages the lock, as does pressing one of the start buttons.

When the single-play spindle is inserted and the mode switch set to **AUTO**, the 810 will repeat a record indefinitely. The **STOP** button must be used to return the arm to its rest and shut off the motor. In automatic operation, pressing **STOP** will drop the next record (if there is one on the spindle) and return the pickup to the rest before shutting off the motor. Any record in a stack can be rejected by pressing the starting button.

The arm-indexing position is controlled by a knob on the motorboard instead of the usual screwdriver adjustment. This can be a convenience when using records having different lead-in groove widths. Anti-skating correction is applied by a calibrated knob, with separate scales for conical and elliptical styli. The BSR 810X's dimensions are 17 $\frac{1}{8}$ inches wide, 12 $\frac{1}{8}$ inches deep, and 9 $\frac{1}{4}$ inches high (with dust cover in place). It weighs 22 lbs.

The BSR 810 automatic turntable alone is available for \$149.50. The 810X Total Turntable package comes with a tinted plastic dust cover and is already mounted on a handsome walnut base that has a storage compartment for unused record spindles and other accessories. The Shure M91E cartridge is installed and correctly positioned. The normal retail price for these components is about \$240, but the 810X package can be purchased for less than \$190.

● **Laboratory Measurements.** The turntable rotated at exact speed with the vernier control at its center setting, and the vernier adjustment range was +3, -2 per cent. Speed was unaffected by a line voltage change of 95 to 140 volts. The wow and flutter were very low—respectively 0.03 and 0.045 per cent at 33 $\frac{1}{3}$ rpm, and 0.05 and 0.04 per cent at 45 rpm. The unweighted rumble was -31 dB including both vertical and lateral components, and -36.5 dB with vertical rumble canceled out by paralleling the two cartridge channels. With the CBS RRLI weighting (which correlates with the relative audibility of different rumble frequencies), the rumble was -54 dB. It was predominantly 30 Hz, the motor-revolution rate. This low rumble is typical of other top-grade turntables, both



Most of the BSR 810X's controls and adjustments are very handily grouped along the right side of the turntable's motorboard.

single-play and automatic, that we have recently tested.

The arm tracking-force dial calibration was very close at 1 gram (the actual force was 1.05 grams), but at higher settings the true force was 10 to 12 per cent higher than indicated. There was only a 0.05-gram decrease in force (at 1 gram) when playing the top record of a six-record stack. The arm friction, as indicated by the freedom with which the arm floated when balanced, was very low.

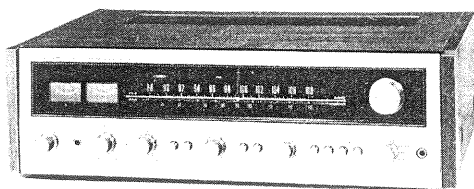
The tracking error was less than 0.6 degree per inch of radius over the entire record, and was typically under 0.4 degree per inch. These are normal (and negligible) errors for a properly designed arm of this length. The anti-skating compensation was slightly lower than required when its dial was set to agree with the 1-gram tracking force we used. Exact compensation required a setting of 1.3 grams. This difference is so slight that it can safely be ignored.

The cueing system worked very smoothly, with negligible outward drift (less than one groove) of the pickup during descent. The change cycle required 13 $\frac{1}{2}$ seconds at 33 $\frac{1}{3}$ rpm and 10 seconds at 45 rpm—times typical of most automatic turntables.

● **Comment.** The BSR 810X, undeniably a well-constructed and attractively styled record player, was also a very easy one to operate. The controls had a smooth, positive feel and action. The Shure M91E cartridge (which we tested in July 1969) is an ideal choice for the low-friction arm of the 810 turntable, and will track any record at 1 gram. Like the 810X, the Shure cartridge ranks with the very best in overall quality. It would be difficult to match the overall performance, flexibility, and convenience of the Total Turntable package with user-assembled components, at its price. Anyone who has installed his own cartridge and made the necessary positioning adjustments will appreciate the convenience of buying a quality "ready-to-play" unit.

For more information, circle 106 on reader service card

Pioneer SX-727 AM/Stereo FM Receiver

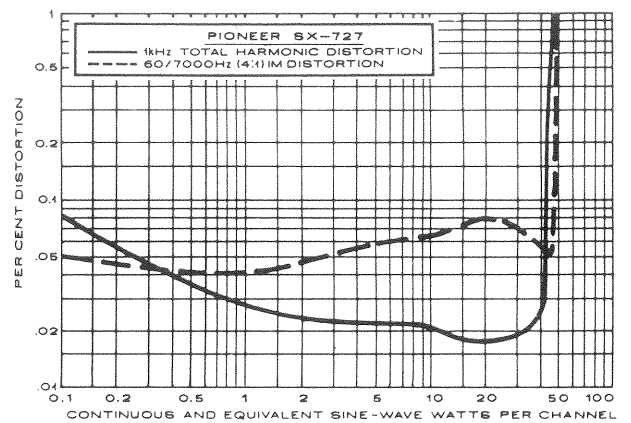
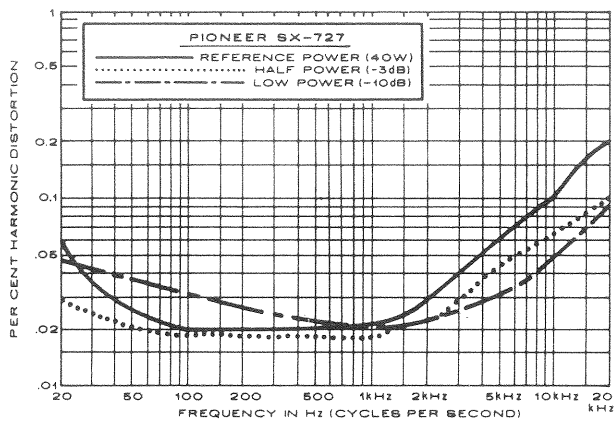


● PIONEER's moderately priced SX-727 has a degree of operating flexibility and electrical performance previous-

ly found only in some of the most expensive receivers. The amplifiers of the SX-727 are rated at 37 watts per channel continuous into 8-ohm loads from 20 to 20,000 Hz, with less than 0.5 per cent distortion. Six other power ratings are also given in the specifications, thus enabling the shopper to make comparisons with other equipment rated by less rigid standards.

The FM tuner has a two-stage FET r.f. amplifier, complemented by IC's and ceramic filters in the i.f. section.

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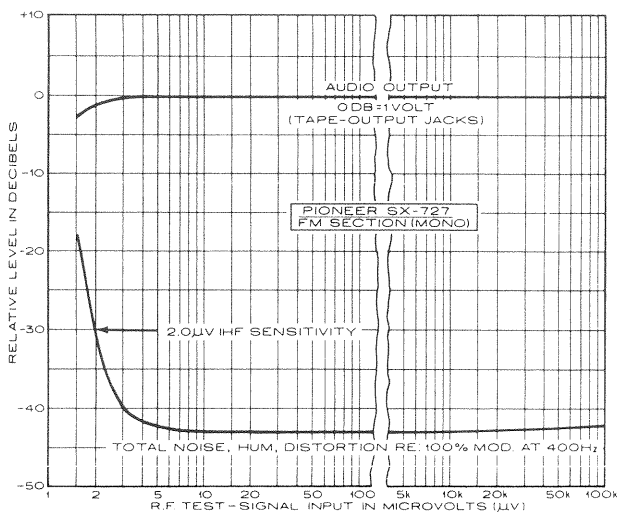


The FM tuning-dial scale has linear calibration intervals, and there are two tuning meters: zero-center for FM, and signal-strength for FM and AM.

The SX-727's array of operating features is impressive. The power switch also selects one of three pairs of speakers, or two combinations of two pairs simultaneously. Like other Pioneer receivers, the SX-727 uses convenient plugs to which the speaker wires are connected before they are plugged into the rear of the receiver. Next to the speaker selector is the phone jack, followed by the bass and treble tone controls, of which there are two each, concentrically mounted for separate adjustment of each channel. They are detented, with five positions of both boost and cut plus a center "off" position for flat response. Two pushbuttons control the low- and high-cut filters.

In the center of the control lineup is the balance control. At its right are the FM interstation-noise muting and audio-muting pushbuttons (the audio-mute button drops the volume by 20 dB for temporary listening interruptions). Next is the volume control, followed by the loudness-compensation and stereo/mono pushbuttons. Two others control tape-monitoring for two tape recorders. With these buttons one can also dub from one recorder to the other, monitoring from the playback amplifiers of the second recorder.

The input-selector knob has positions for AM, FM MONO, FM AUTO (automatic stereo/mono switching), two magnetic-phonograph cartridges, a microphone, and a high-level AUX source. The front-panel microphone jack accepts a single mono microphone, the signal from which is



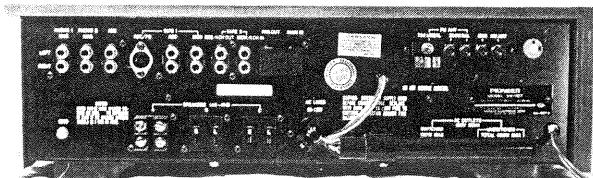
fed into both channels. The microphone signal is present at the tape-output jacks, but there is no independent control of microphone level.

In the rear are the normal inputs and outputs, including FM and AM antenna terminals (there is also the usual pivoted AM ferrite-rod antenna) and three a.c. convenience outlets, one of which is switched. The preamplifier outputs and main amplifier inputs are brought out to separate jacks, normally joined by jumper plugs. This facility can be used to connect external electronic-crossover networks, equalizers, and similar accessories. The TAPE 1 connectors are paralleled by a DIN socket. The TAPE 2 inputs and outputs can be used for connections to and from an external quadrasonic decoder and separate stereo amplifier to convert the system to four-channel operation. The Pioneer SX-727 is supplied complete with a walnut-finish wooden cabinet. Price: \$349.95.

● **Laboratory Measurements.** We measured the IHF sensitivity of the SX-727's FM tuner at 2 microvolts. A 50-dB signal-to-noise ratio was achieved with only a 2.5-microvolt input, and the ultimate quieting was 74 dB (better than the rated 70 dB). These figures indicate that the Pioneer will provide more listenable stations than some other FM receivers that may have slightly better sensitivity, but without the Pioneer's very steep limiting curve. The image rejection and alternate-channel selectivity were also exceptionally good: 95 dB and 90 dB, respectively—both considerably better than Pioneer's ratings. The AM rejection was 57 dB, and the capture ratio was a good 1.6 dB. The stereo FM separation was among the best we have measured, exceeding 40 dB from 300 to 2,000 Hz; it was no lower than 19 dB at the extremes of 30 and 15,000 Hz. The FM frequency response

(Continued on page 38)





The SX-727's three pairs of speaker outputs accept the special plug-in connectors supplied with the receiver. One of these is shown in place, without the speaker leads attached.

was flat within ± 0.5 dB from 30 to 11,500 Hz; it was down 2.6 dB at 15,000 Hz. The AM tuner was unexceptional in quality, with restricted high-frequency response that was down 6 dB at 2,300 Hz.

The audio section of the SX-727 easily surpassed its ratings in every respect. The output clipped at almost 60 watts per channel (continuous) into 4 ohms, 44 watts into 8 ohms, and 25.4 watts into 16 ohms. Harmonic and intermodulation (IM) distortion were very low. HD was under 0.05 per cent at most frequencies and power levels up to 40 watts per channel into 8 ohms, and reaching a maximum of 0.2 per cent at 20,000 Hz and 40 watts output. For a 1,000-Hz test signal, the distortion was under 0.03 per cent from less than 1 watt to slightly over 40 watts (it was below the noise level at power outputs much below 1 watt). The IM distortion remained under 0.1 per cent at all power outputs from 45 watts to 15 milliwatts, and reached 0.3 per cent only at the very low minimum measurable level of 1.5 milliwatts. This indicates a virtually complete absence of "crossover distortion," which means that in this area the unit is comparable to the finest amplifiers we have tested.

The phono gain was high (1.15 millivolts for a 10-watt output), yet the overload level was 100 millivolts—an excellent safety margin. Noise levels were very low: -80 dB on AUX and -78 dB on the phono inputs, referred to a 10-watt output. The audio tone-control characteristics were conventional, with a moderate boost and cut range at low frequencies and somewhat less at high frequencies. The loudness compensation boosted both low and high frequencies at volume-control settings of -20 dB or less. The filters had mildly effective 6-dB-per-octave slopes, with the -3 -dB points at 60 and 5,000 Hz. RIAA equalization was very accurate—within ± 0.8 dB from 30 to 15,000 Hz. The microphone frequency response was flat from 20 to about 4,000 Hz, falling off slightly to -3 dB at 15,000 Hz. This is considerably beyond the frequency range of any microphone likely to be used with the unit.

● *Comment.* When we examined the features and tested the performance of the Pioneer SX-727, it was clear that in its flexibility and in many areas of its measured performance it is somewhat better than much of the competition at its price level. Perhaps no one of the SX-727's characteristics gives it a clear advantage over any other receiver, but taken in the aggregate they define a really superb product.

In use tests, everything worked smoothly and exactly as intended. The muting was noise- and thump-free, and its threshold of about 4 microvolts means that any station strong enough to un-mute the receiver will be heard free of distortion and noise. With a combination of tasteful styling and top-notch performance, the SX-727 speaks well for the new line of Pioneer receivers.

For more information, circle 107 on reader service card

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