Equipment profiles

Scott Model R-376 AM/FM Stereo Receiver

MANUFACTURER'S PUBLISHED SPECIFICATIONS

FM Tuner Section

Usable Sensitivity: Mono, 4.9 dBf (sic), 1.8 μV; Stereo, 24 dBf (sic), 18 μV. **50-dB Quieting:** Mono, 10 dBf (sic), 3.5 μV; Stereo, 36 dBf (sic), 70 μV. **S/N:** Mono, 68 dB; Stereo, 65 dB. **THD:** Mono, 0.2%, 1 kHz; Stereo, 0.3%, 1 kHz. **Capture Ratio:** 1.2 dB. **Selectivity:** 70 dB. **Image Rejection:** 70 dB. **Spurious Rejection:** 85 dB. **AM Suppression:** 60 dB. **Stereo Threshold:** 7 to 15 μV. **Muting Threshold:** 2 to 10 μV. **Stereo Separation:** 35 dB @ 1 kHz, 38 dB at 100 Hz, 34 dB @ 10 kHz.

AM Tuner Section

Usable Sensitivity: 100 μV (internal ant.). **Selectivity:** 36 dB. **S/N:** 50 dB. **THD:** 1.0%.

Amplifier Section

Power Output: 75 watts min. continuous per channel, 8 ohms, 20 Hz to 20 kHz. **Rated THD:** 0.2%. **Rated IMD:** 0.1%. **Damping Factor:** 35. **Frequency Response:** Phono, RIAA ±1.0 dB, AUX: 15 Hz to 35 kHz ±1.0 dB. **Input Sensitivity:** Phono, 2.5 mV or 6.0 mV, selectable; High Level, 150 mV. **Phono Overload:** 120 mV. **S/N, Weighted:** Phono, 75 dB; Mike, 80 dB; High Level, 85 dB. **Bass & Treble Control Range:** ±10 dB at 100 Hz and 10 kHz; mid-range, ±6 dB at 1 kHz. **High Filter Cut:** 10 dB @ 10 kHz. **Low Filter Cut:** 10 dB @ 100 Hz.

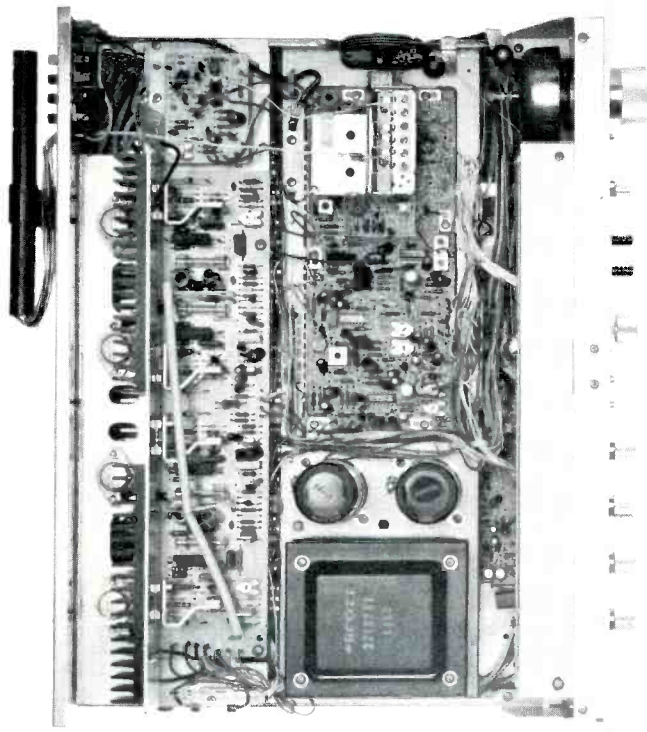
General Specifications

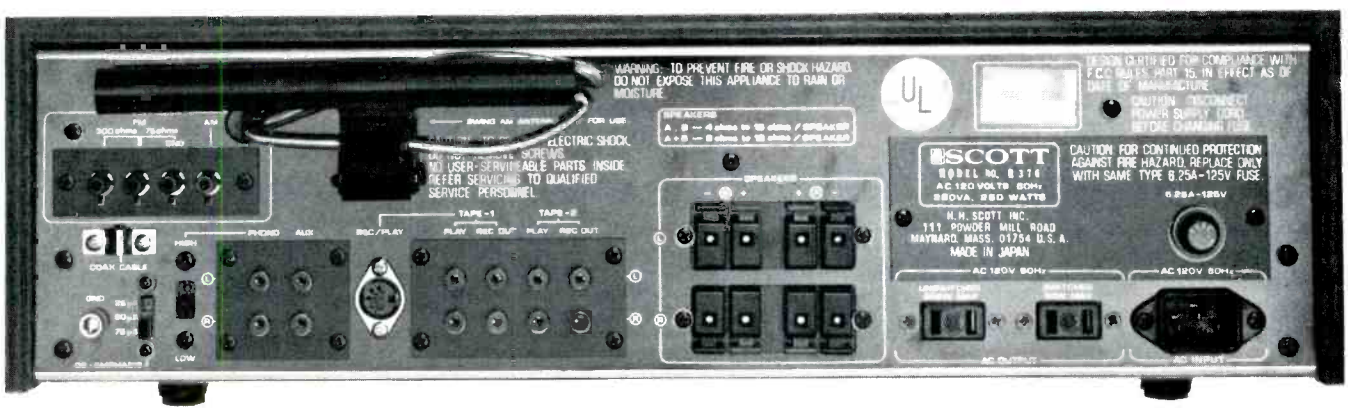
Dimensions: 19 3/8 in. (49.1 cm) W x 5 11/16 (14.4 cm) H x 15 7/8 (40.3 cm) D. **Weight:** 30.8 lbs. (14 kg). **Price:** $549.95.

While on one hand we certainly commend Scott for being one of a handful of manufacturers who, so far, have adopted the new power designations for signal strength, we do have a minor gripe with the tuner sensitivity and quieting specifications given above, in that every dBf figure is off by a factor of two to one. (Editor's Note: Scott tells us that they caught the error just as the literature was coming off press and that they are in the process of revising this material.)

With that aside, let's examine what, to date, is Scott's highest powered integrated receiver. Its front panel resembles those of many other units which have abandoned the "black-out" dial area format in favor of an all light-colored treatment in which dial scale numerals are screened in a dark color on a light, well illuminated sloped background. FM calibration is in MHz increments, with no intermediate markings, and is almost linear from end to end, while AM markings are compressed at the high end of the scale. Five indicator lights above the right section of the dial scale show the program source selected, while a single light at the left of the dial opening is illuminated in the presence of a stereo signal. Signal-strength and center-of-channel tuning meters (the former calibrated in numerals from 0 to 5) are illuminated separately and positioned above the frequency scales between "88 MHz and 99 MHz." A large tuning knob, coupled to an effective flywheel, is located to the right of the dial area opening. The lower section of the front panel has a stereo headphone jack at the left, adjacent to a speaker selector switch which also serves as a power *On/Off* switch in its extreme counterclockwise position. An *Off* position is included for headphone-only listening, as well as settings for *Main*, *Remote*, or *Both* sets of speakers which might be connected to the receiver. Bass, midrange, and treble controls, each controlling both channels simultaneously, come next, followed by low- and high-cut filter pushbuttons, a dual concentrically mounted volume and balance control, three position tape-copy and tape monitor switches (lever type), a program selector switch, stereo/mono and loudness push-button switches, an FM muting on/off push button, and a microphone input jack. Unlike many other receivers sporting a mike input jack, this mono microphone circuit is selectable by means of the main program selector switch and can therefore not be used to mix live voice sounds with other program sources. We think that few users are likely to use a piece of equipment such as this as a mono P.A. amplifier, since microphone facilities (in stereo at that) are available on just about any piece of tape equipment likely to be used with this receiver.

The rear panel of the Scott R-376 has antenna terminals for external AM, ground, 300-ohm and 75-ohm FM antenna connections. Strangely, the cable clamp provided for 75-ohm retention is mounted beneath the 300-ohm pair of terminals rather than below the 75-ohm and ground terminals, where it should have been, and it is necessary to make a tight bend in the coax cable to use this clamp properly. Adjacent to a chassis ground terminal is a three-position de-emphasis switch with settings for 25, 50, and 75 microseconds. (Scott makes this unit for worldwide use, not just for the U.S. Thus, the 50 microsecond de-emphasis is for Europe and South America, and the 25 microsecond de-emphasis for Dolby encoded FM. The owner's manual is printed in French and English.) A phono sensitivity switch, marked *Low* and *High*, alters input sensitivity of the phono jacks from 2.5 mV to 6 mV; the position marked *High* provides the *lower* sensitivity. A record/play DIN socket parallels the pin-jack *Tape 1* inputs and outputs, which are followed





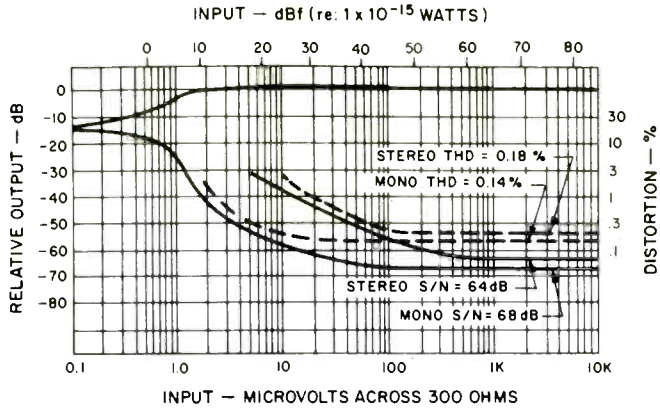


Fig. 1—FM quieting and distortion characteristics.

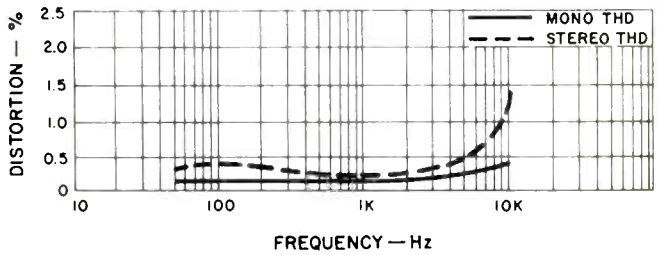


Fig. 2— FM distortion vs. frequency.

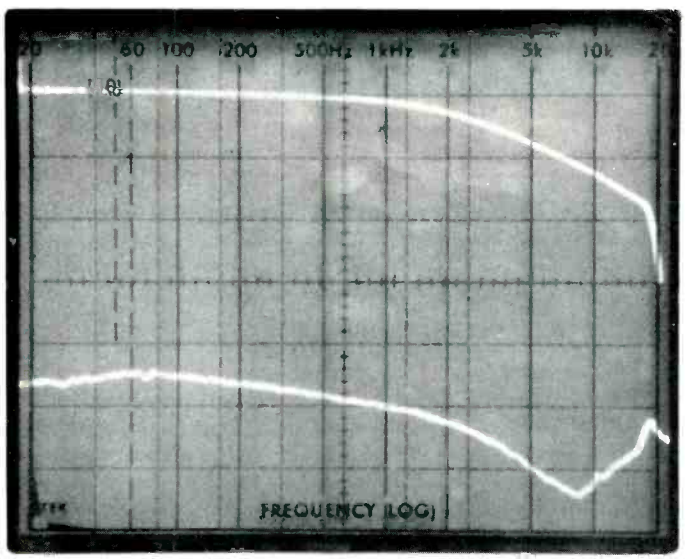
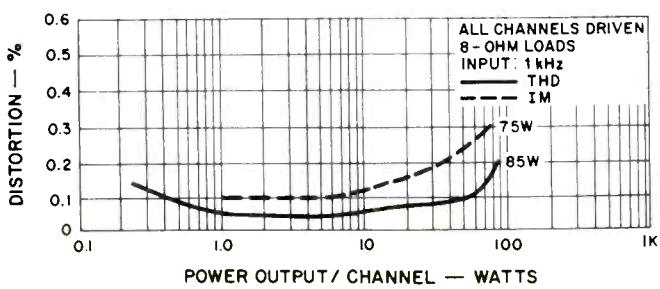


Fig. 3—FM tuner section stereo separation vs. frequency. (Note that no de-emphasis compensation has been applied.)

Fig. 4—Harmonic and intermodulation distortion characteristics.



by in and out jacks for a second tape deck, spring-loaded speaker terminals which handle either vertical or horizontal insertion of the stripped ends of speaker wires, unswitched and switched a.c. receptacles, and a line fuse-holder. A heavy-duty line cord is packed separately so that the proper one can be shipped for different countries here and in Europe. A swing-down AM ferrite bar antenna completes the rear panel layout.

Since no circuit information or schematic diagram was available, because this particular unit was one of the first off the production line, we're not able to discuss circuitry except to say that, upon examination of the internal construction of this receiver, we found it to be well fabricated, with a minimum of hand wiring between circuit boards. Beyond that cursory observation, we relied on our bench measurement tests and listening tests for the rest of this evaluation and report.

FM Tuner Section Measurements

Usable sensitivity in mono measured 1.7 μV (9.8 dBf), while for stereo the figure obtained was 7.0 μV (22.1 dBf), the latter considerably better than claimed by Scott (assuming the microvolt figures are the correct ones and not the "dBfs" listed alongside). The 50-dB quieting point in mono measured 3.5 μV (20.8 dBf), exactly as claimed, while in stereo, again the sample did better than claimed, reaching 50-dB quieting with an input signal strength of 36 μV (36.3 dBf). Ultimate S/N in mono reached 68 dB as claimed, but fell just a bit short of the 65 dB figure for stereo, with readings of 64 dB. Quieting characteristics and distortion (at 1 kHz) curves for mono and stereo operation are plotted in the graphs of Fig. 1. Mono distortion was 0.14 per cent, while in stereo, for a 1-kHz modulating signal, it was only a little poorer at 0.18 per cent. Distortion characteristics in mono and stereo FM versus modulating frequencies are graphed in Fig. 2, and, at the highest required test point in stereo (6 kHz), THD measured 0.5 per cent. We measured a capture ratio of 1.4 dB, while selectivity measured exactly 70 dB, as claimed, and image and spurious rejection were somewhat better than claimed, with readings of 73 dB and 90 dB respectively. AM suppression measured 57 dB, a bit poorer than claimed. Both stereo and muting threshold were set at 5.0 μV (19.2 dBf), a reasonable figure considering the quieting and THD capabilities of the receiver. Frequency response was a bit down at the high end, about 1.5 dB lower than the usual 75 microsecond de-emphasis curve would require, and a slight rising characteristic amounting to about 0.5 dB was noted down around 50 Hz.

Stereo separation was plotted using our spectrum analyzer to depict output versus frequency for the modulated and unmodulated channels, and the results are shown in the 'scope photo of Fig. 3. The consistency of separation across the entire frequency spectrum of interest was among the best we have seen, with separation readings of 50 dB at mid frequencies, 51 dB at 100 Hz, and 40 dB at 10 kHz. (Note that we have not compensated for de-emphasis here.)

AM Tuner Section Measurements

Usable sensitivity in AM, referred to the external antenna input, measured 20 μV, while selectivity measured 38 dB, a bit better than claimed, while THD (for 30 per cent modulation) was 1.0 per cent, as claimed.

Amplifier Section Measurements

In suitably small type (in conformance with FTC requirements) Scott claims a power output of 80 watts per channel

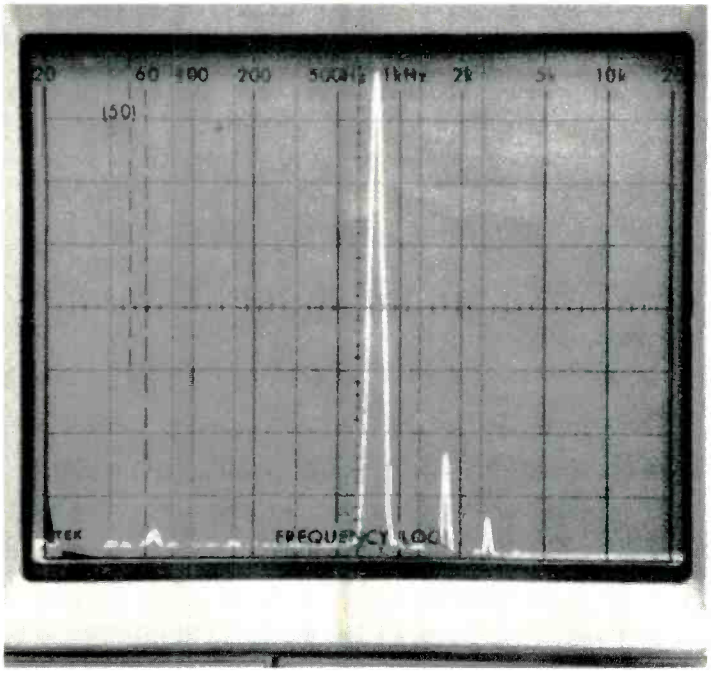


Fig. 5—Spectrum analysis of THD at 75 W output @ 1 kHz.

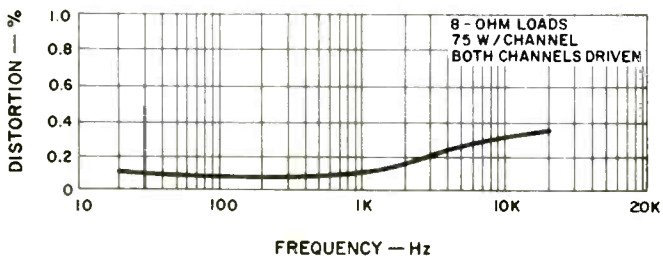
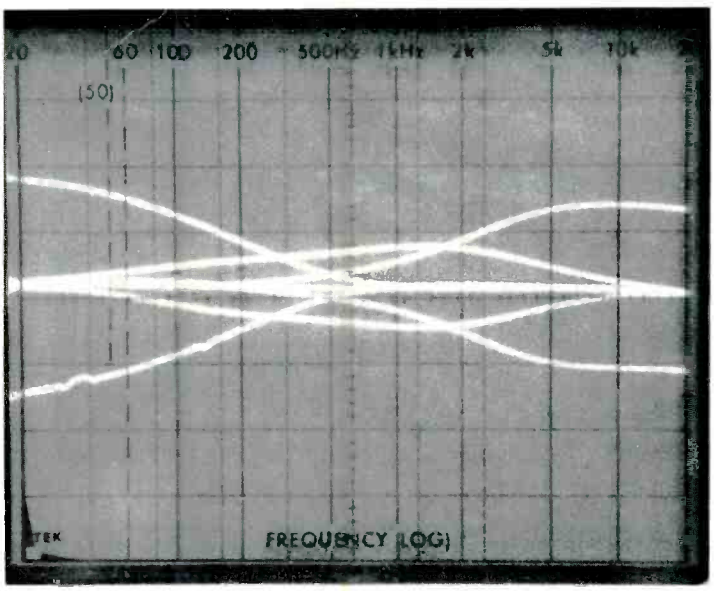


Fig. 6—Distortion vs. frequency of the amplifier section with both channels driven at 75 W into 8 ohm loads.

Fig. 7—Bass, treble, and midrange control ranges.



for 1 kHz signals; we measured better than that, 85 watts per channel for the rated 0.2 per cent THD figure. As for the power rating from 20 Hz to 20 kHz, Scott gives us a figure of 75 watts per channel, a power output level easily met at low frequencies (where THD for that output level was a very low 0.075 per cent), though the unit fell short at the 20 kHz extreme, where we measured 0.35 per cent THD. As for IM distortion, it crossed the rated 0.1 per cent level at 10 watts or so and increased very gradually to 0.3 per cent at full rated output of 75 watts per channel. Distortion and IM versus power output for a 1-kHz test signal are shown in the graphs of Fig. 4, while a spectrum analysis of an output 1-kHz signal at 75 watt level (Fig. 5) discloses that the residual THD consists almost entirely of low level second and third order harmonics, the worst of which is down a bit more than 60 dB below the fundamental, in good agreement with our single THD reading of 0.12 per cent for the 75 watt level.

Preamplifier measurements showed phono input sensitivities of 2.5 mV and 6.0 mV for the two switch settings on the rear panel, exactly as claimed. Overload in phono measured 125 mV for the most sensitive input setting and 285 mV with a 6.0 mV input sensitivity. Hum and noise, unweighted, measured a very good 71.5 dB referred to actual input sensitivity and full output. While the low frequency end of the RIAA equalization characteristic was virtually a carbon copy of the prescribed curve, roll off at the high end was insufficient by about 2.5 dB which, in our later listening tests, resulted in a somewhat brilliant high end.

Hum and noise for the high level inputs measured 86 dB below rated output, and the same figure applied for minimum volume settings. Frequency response at the high level inputs was within 1 dB of flat from 10 Hz to 53 kHz, rolling off by 3 dB at 63 kHz.

Range of response of bass, mid-range, and treble controls is depicted in our 'scope photo of Fig. 7. While bass range was as expected, we were surprised and pleased to see the "shelving" of the treble control's maximum boost and cut range above about 5 kHz. Unlike some treble controls which continue to boost output more and more with increasing frequency, the levelling off of the maximum boost in the Scott R-376 is sure to save the life of a few tweeters which belong to those who insist upon cranking up their treble controls all the way. In our view, the mid-range control affects a bit too much of the audio spectrum, though its peak effect, at just below 2 kHz, is just about where we like to see maximum action from this type of control.

Filter responses, plotted in the 'scope photo of Fig. 8, have desirable 12-dB-per-octave slopes for both low cut and high cut, though we would have preferred to see the turnover points a bit closer to the frequency extremes since only one turnover point for each type of filter is available.

Loudness control action is typical of the breed, with varying degrees of both bass and treble emphasis introduced as volume control settings are lowered. Response at various levels with the loudness circuit "in" is shown in the multiple traces of Fig. 9.

Summary—Use and Listening Tests

Overall, we feel that the Scott R-376 is conscientiously designed and is easy to use. Certainly, it has all the control features and much of the flexibility demanded of a modern all-in-one stereo component. We encountered no evidence of overheating in continued use. Power output was ample enough to drive medium to moderately low-efficiency speaker systems, though the manner in which the amplifier section approached clipping levels left something to be desired, sonically speaking. In terms of the so-called

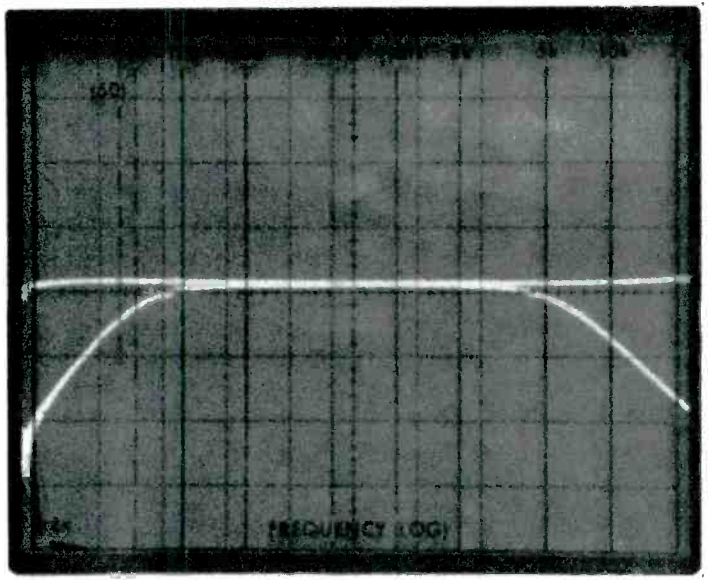


Fig. 8—High- and low-cut filter response.

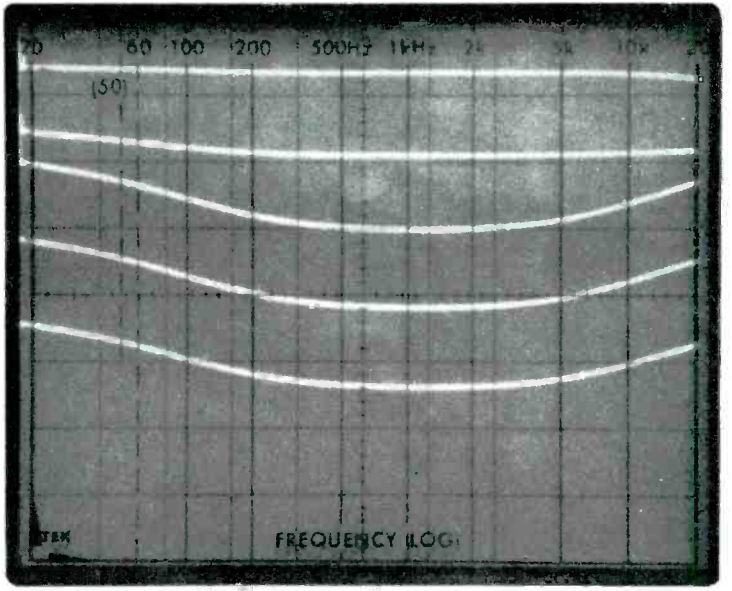


Fig. 9—Loudness compensation of the Scott R-376 Receiver.

cost/performance ratio, power output level is consistent with the suggested retail price of the R-376. Other specifications, both claimed and met, suggest that the receiver is priced at about the same level compared to other receivers in the same general category. FM reception was good, with all our usual station signals received without difficulty. In one or two instances (where signals broadcast are known to be exceptionally noise free and low in distortion), we were able to detect just a little residual noise and a bit of hum. An outdoor antenna used with these stations should bring up signal levels to produce the full 68-dB S/N performance (64 dB in stereo) of which this receiver was capable on the bench. The receiver does earn high marks on styling and control layout and is well dimensioned for shelf or table-top installation, as well as for incorporation into a custom-designed piece of furniture. *Leonard Feldman*

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