Equipment Profiles

GTE Sylvania Model RS4744
Stereo Receiver

MANUFACTURER'S SPECIFICATIONS

FM Tuner Section

IHF Sensitivity: 1.8 μV (10.5 dBf). **50 dB Quieting:** 3.0 μV (14.93 dBf). **S/N Ratio:** 67 dB. **Capture Ratio:** 1.5 dB. **Image Rejection:** 53 dB. **I.F. Rejection:** 50 dB. **Selectivity:** 55 dB. **AM Suppression:** 35dB. **Spurious Rejection:** 80dB. **THD:** Mono, 0.4%; Stereo, 0.4%. **Stereo Separation:** 1 kHz, 40 dB; 50 Hz to 10 kHz, 30 dB. **FM Muting Threshold:** 5 μV (19.37 dBf).

AM Tuner Section

Sensitivity: 200 μV/m (internal antenna). **Image Rejection:** 60dB. **Selectivity:** 28dB.

Amplifier Section

Power Output: 60 watts per channel min. rms at 8 ohms from 20 Hz to 20 kHz, with no more than 0.25% total harmonic distortion. **Damping Factor:** 20. **IM Distortion:** 0.25% at rated power output. **Frequency Response:** Phono, RIAA ±1.5 dB; High Level, 7 Hz to 70 kHz ±1.0 dB. **Input Sensitivity:** Phono, 2.2 mV; Mike, 1.2 mV; Tape and AUX, 250 mV. **S/N:** Phono, 70 dB below 10 mV input; Mike, 65 dB below 5 mV input; AUX and Tape, 75 dB below 250 mV input. **Tone Control Range:** Bass, ±18dB @ 50 Hz; Mid-Range, ±10 dB @ 1.5 kHz; Treble, ±12 dB at 10 kHz. **Filters:** Low, -20 dB @ 20 Hz, 12 dB/octave; High, -20 dB @ 20 kHz, 12 dB/octave.

General Specifications:

Dimensions: 17-3/4 in. W by 6 in. H by 15 in. D. **Weight:** 29 lbs. **Suggested Retail Price:** $479.95.

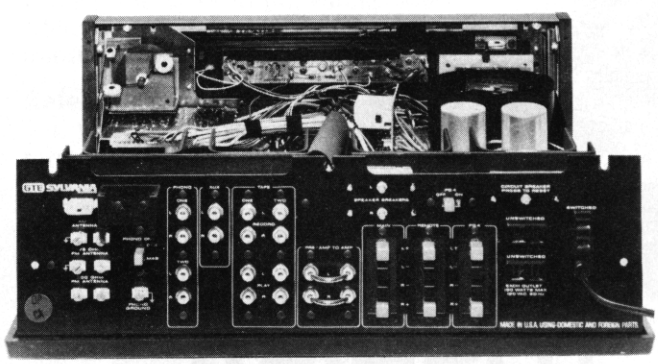

Fig. 1—Rear view of Sylvania RS4744.

It is fairly obvious, even from a cursory examination of the RS4744, that GTE Sylvania means to capture whatever share of the high end of the component audio business that is to be had, and wipe out whatever association the firm had with medium-fi compacts and consoles. "Obvious," we say, since it seems obvious to us that the Batavia, New York firm has spent a great deal of engineering and design time to create a line of stereo receivers that combines the advantages of American mass-production economies with the top audio performance of true componentry. If the RS4744 is typical of the results, we would say that Sylvania's efforts should prove successful.

This most powerful of Sylvania's new receivers has a good looking, bronze-gold colored front panel with enough controls and buttons to satisfy the audio perfectionist. A large black-out dial area includes a long, linearly calibrated FM frequency scale (with markings at every half MHz), an equally long AM scale, and a 0-100 reference logging scale. The dial pointer is illuminated for easier visibility. To the left of the scales are a pair of illuminated meters for signal strength and center-of-channel FM tuning. At the right of the dial scale, the words "FM MPX" light up to indicate stereo FM reception, and beyond the dial area to the right is a large metal tuning knob coupled to a fairly effective flywheel.

A power on/off push button and phone and mike jacks are located at the lower left of the panel, followed by main and remote speaker lever switches. Operation of these switches is such that with both main and remote levers in their "up" positions, main speakers are engaged. To activate remote speakers, that switch must be thrown downward, as must the "main" switch to *turn off* the main speakers—a nice touch of human engineering that maintains symmetry of switch positions for most often used applications.

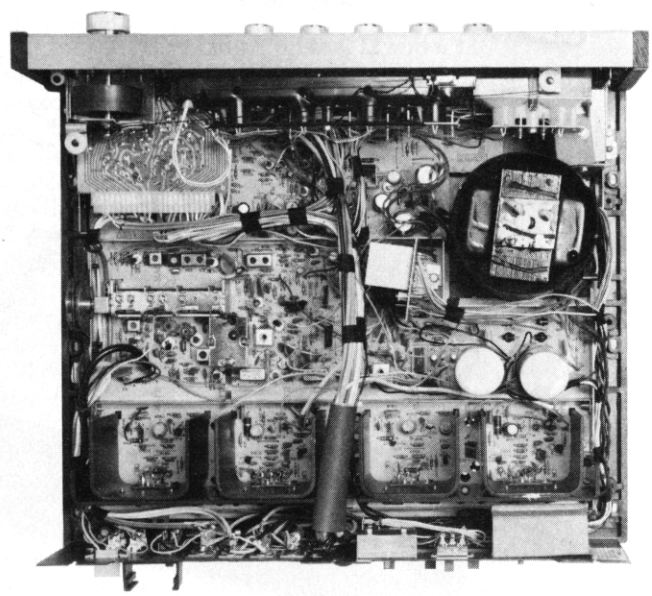

Fig. 2—Internal view.

Dual concentric, clutch-type bass, mid-range, and treble controls of the rotary type come next, followed by the usual balance and master-volume controls. At the lower right of the panel are two rows of pushbuttons. The upper row of six handles two tape monitor circuits, high- and low-cut filters, mono/stereo switching, and loudness control activation. The lower row of six selects program sources (a pair of phono inputs, AUX, AM and FM) and muting for FM. If both phono buttons are depressed simultaneously, the mike input circuit is selected—another nice touch that cuts down on the number of required buttons.

The rear panel of the RS4744 is pictured in Fig. 1. The AM ferrite-bar antenna is supplied in a separate package, and must be slipped into a retaining slide and plugged in to an appropriate multi-contact socket on the rear panel. This simplifies packaging of the receiver and prevents possible breakage of the bar antenna during shipment. Screw terminals are provided for external AM antenna and 75-ohm or 300-ohm FM antennas. Of the two pairs of phono inputs, one pair is associated with a slide switch which converts it to a ceramic phono-cartridge input. While it is convenient to be able to thus use a ceramic cartridge directly, we question whether anyone investing just under $500.00 in a stereo receiver would really use a ceramic cartridge with it. AUX input jacks and tape in and out jacks for the two tape monitor circuits come next, followed by preamp out/main amp in jacks with the usual jumpers connected between them. There are three sets of speaker terminals of the push-to-insert speaker wire type. Besides main and remote pairs of speakers, a pair of speakers may be connected to the third set, identified as PQ-4, and turned on by means of a slide switch to provide a synthesized four-channel effect through a passive matrix network built into the receiver. Speaker and power line circuits are equipped with resetable circuit breakers—tiny red buttons are pressed to reset the breakers in the event of overload, thereby eliminating the need for fuses. A pair of unswitched and one switched a.c. receptacle and a chassis ground terminal complete the rear panel layout.

An internal view of the RS4744 chassis is shown in Fig. 2. Most of the circuit parts are contained on a single, massive printed circuit board, as opposed to the modules used by other manufacturers. It is clear, too, that this same master board is used for less powerful, less expensive models in the Sylvania line. A sub-panel PC board containing one row of switches (tape monitors, filters, mono/stereo and loudness) is wired to the "mother board by means of a multiple connector cable.

FETs are used in the FM front-end as r.f. amplifier and mixer, which are tuned by means of a three-section variable capacitor. A pair of ceramic filters are used between i.f. stages, followed by an IC limiter-amplifier-quadrature detector. The MPX circuit is a phase-lock-loop type, contained in a single IC which requires no coil alignment for optimizing separation. A rather elaborate muting circuit utilizes several transistor stages plus an FET Mute Gate. The AM section uses discrete parts and is tuned by means of a three-gang capacitor and tunable i.f. coils. Phono preamplifiers utilize two transistors each with negative feedback applied for RIAA equalization. Tone-control circuitry is of the negative-feedback type, and tone-amplification circuits use a single Darlington circuit for each channel. The first stage of each power amplifier section is a differential amplifier, and there is direct coupling from input to speaker output in these sections. Output stages are powered by plus and minus 50 volts in a push-pull complementary (NPN-PNP) symmetry arrangement. An electronic current-limiting circuit protects the amplifier from improperly connected speakers, excessive current or short circuits. In the event of overload, a relay actually disconnects the secondary of the power transformer from the high-voltage supply rectifiers.

FM Section Measurements

The graphs in Fig. 3 show some of the most important FM performance characteristics. Usable sensitivity measured 1.9 μV (11.0 dBf), as against 1.8 μV claimed. The 50-dB quieting figure exceeded the published 3.0 μV claim, requiring only 2.8 μV (14.33 dBf) of input signal strength. Ultimate quieting in mono was 72 dB, with best quieting of 60 dB obtain in stereo operation. Stereo usable sensitivity was a low and excellent 4.0 μV (17.4 dBf), and muting threshold was set to 5 μV. Distortion at mid-audio frequencies measured 0.27% in mono; 0.3% in stereo, both better than claimed. Capture ratio measured exactly 1.5 dB as claimed, and selectivity was 57 dB, a bit better than claimed but not as good as other receivers in this price category. This specification, as well as the moderate i.f. rejection (50 dB) and AM suppression (35 dB), appears to be a combined result of the rather minimal r.f. and i.f. circuitry used in this design.

Stereo FM separation is plotted in Fig. 4 and measured 40 dB at mid-frequencies, decreasing to 32 dB at 50 Hz and 31 dB at 10 kHz. Distortion in both mono and stereo remained at or below 0.5% for all frequencies up to 9 kHz. At the three frequencies specified in the new FM measurement standards, THD was 0.4% (100 Hz), 0.27% (1 kHz) and 0.22% (6 kHz) in mono and 0.5%, 0.3% and 0.25% in stereo.

Power Amplifier Measurements

While GTE Sylvania, like all high-fidelity component makers, properly specifies power output for the RS4744 in accordance with FTC regulations, they also publish (in suitably

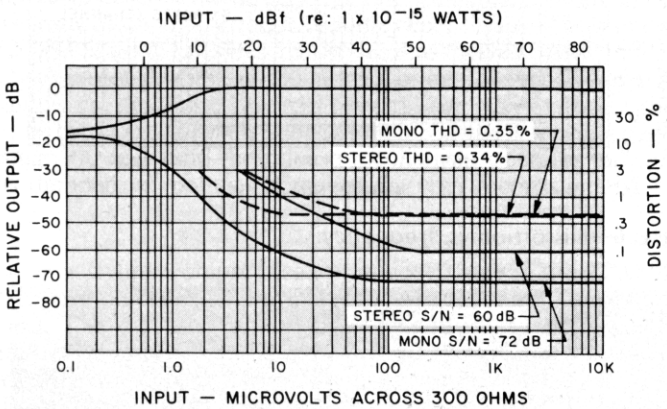

Fig. 3—FM quieting and distortion characteristics.

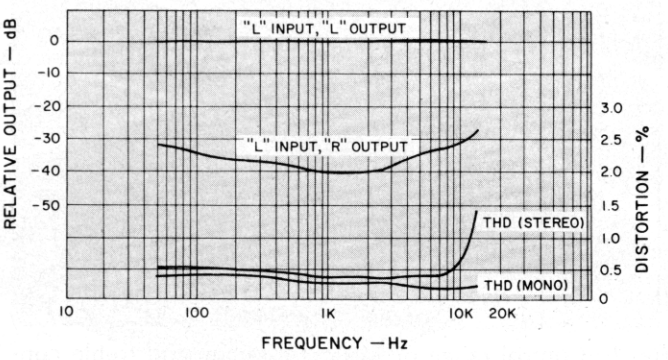

Fig. 4—Separation and distortion vs. frequency.

smaller type face) mid-frequency power capability, which is listed at 75 watts per channel. We actually measured 77 watts of output per channel at 1 kHz with both channels driven, into 8 ohm loads, before the 0.25% rated THD figure was reached, as shown in Fig. 5. At the nominal "FTC power" of 60 watts per channel, THD measured below 0.1% for this mid-frequency. IM distortion in our sample was a bit higher than specified, reaching 0.3% at the nominal 60 watts output, and 0.45% at 75 watts output. The reason for the lower (60 watts) rating over the entire audio band becomes clear when you examine the distortion-versus-frequency graph of Fig. 6. At 20 Hz, with 60 watts delivered from each channel, THD reaches the specified 0.25%. All of these measurements were made after first preconditioning the receiver for one hour, during which time it delivered continuous power of 20 watts per channel into 8 ohm loads.

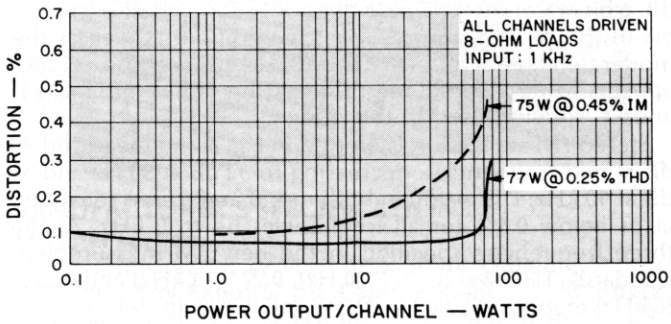

Fig. 5—Harmonic and intermodulation distortion characteristics.

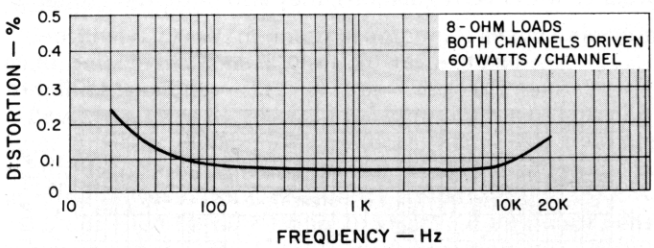

Fig. 6—Distortion vs. frequency.

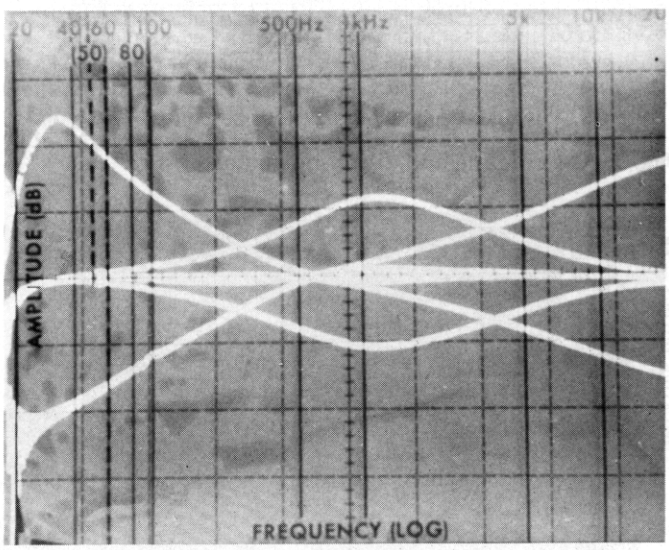

Fig. 7—Control range of base, mid-range, and treble controls.

Preamplifier Control Section Measurements

Phono input sensitivity was identical for both sets of inputs and measured 2.8 mV. Maximum signal input at 1 kHz before overload distortion became apparent was 125 mV. RIAA equalization accuracy was within 1 dB from 30 Hz to 15,000 Hz, and frequency response for high level inputs was flat to within 1 dB from 5 Hz to 38 kHz, with the 3-dB roll-off point occurring at 70 kHz. Figure 7 is a 'scope photo of sequential traces made by our spectrum analyzer from 20 Hz to 20 kHz and depicts the full range of all three tone controls of the RS4744 receiver. Bass boost and cut range is greater than we normally find on receivers, with nearly 20 dB of boost and cut available at the 50-Hz point (each vertical division of the 'scope graticule is equal to 10 dB of amplitude). The action of the extra mid-range tone control is exactly as expected and is centered at around 1.5 kHz as claimed.

In Fig. 8 we plotted action of the loudness compensation circuit from full volume to a -50 dB setting in approximately 10 dB steps and, as can be observed, action involves bass emphasis only. Action of high- and low-cut filters is shown in the 'scope photo of Fig. 9, and a comparison with maximum attenuation of the bass and treble controls (Fig. 7) shows the advantage of these 12-dB-per-octave filters in eliminating noise and rumble with least degradation of musical frequency response.

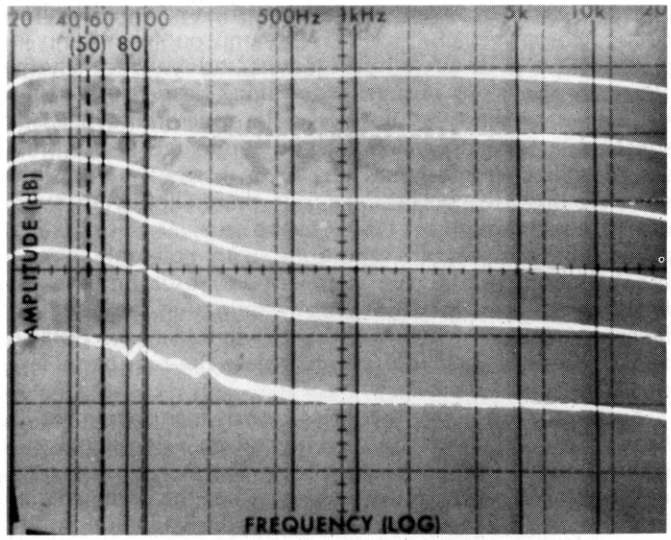

Fig. 8—Loudness control action from full cw setting of volume control to -50 dB below full volume.

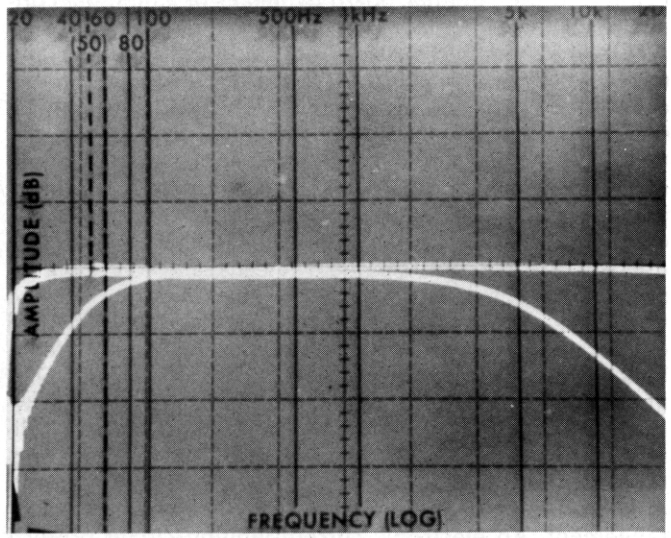

Fig. 9—Action of high-cut and low-cut filters.

Hum and noise in phono measured 61 dB below maximum input sensitivity of 2.8 mV. Translated to a 10-mV input the S/N figure would be 72 dB, better than the 70 dB claimed by Sylvania. Hum and noise in high level use was -84 dB and, at minimum volume, residual hum and noise measured 100 dB below full output.

Use and Listening Tests

Judged by our listening tests, the amplifier section of the Sylvania RS4744 comes out a bit ahead of the tuner section. Power is solid and ample, and when listening at loud levels, one gets the impression that there is actually more power available than the conservatively rated 60 watts per channel. Since enough bass boost range is provided to drive the amplifier into bass clipping even when moderate listening levels are used, this control should be approached with caution, as misuse can really play havoc with reproduced sound.

The FM muting was positive, though we did encounter listening situations where better selectivity would have helped. Admittedly, our Long Island location is a very difficult reception area, and this may not be a problem in less crowded listening areas, where fewer stations are spread across the FM band. AM reception was about average, though sensitivity did not seem as good as we might have expected from a 3-gang tuning system. The PQ-4 circuit works somewhat like the old Dynaco passive four-channel circuit and does provide an interesting, if relatively random, quadraphonic effect with most stereo discs and matrixed quadraphonic records. Glancing through *Audio's* October, 1975 equipment directory issue, we note that most receivers in this price range offer less power (usually 50 or fewer watts per channel) and don't have as many control features as this top-of-the-line entry from Sylvania. If you desire this much power and "under $500" is your price bracket, the Sylvania RS4744 might just be the one you take home. As we said at the outset, the RS4744 should prove to be a successful entry into high-end audio componentry for Sylvania.

Leonard Feldman

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