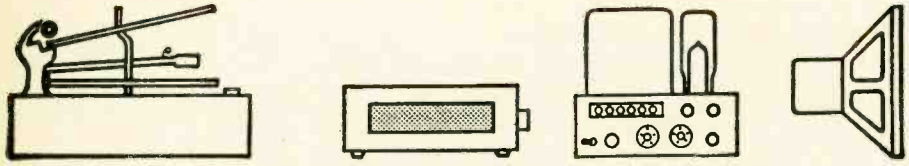
EQUIPMENT PROFILE



H. H. SCOTT MODEL 260 SOLID-STATE AMPLIFIER

With the appearance of more and more transistorized amplifiers, it seems likely that descriptive literature may soon resort to the terminology employed in the automotive industry, for "cool" and "compact" are certain to be used. For whatever else transistors have offered in the amplifier category—and that is plenty—they can be compact, and they certainly run cool.

The new Scott 260 is also compact. Matching other Scott components in general appearance and size (most require the same panel cutout—4¾ x 14¾ in.) it offers a full-size 80 watts (music power) as a fitting companion to the already well-accepted line of Scott tuners—and particularly the 312—and still runs cool enough as not to require any excessive precautions about ventilation. As a matter of fact, it dissipates only 25 watts of heat at standby, and radiates less heat than a 100-watt lamp under full power.

In appearance, the 260 could be a conventional tube amplifier except for its size. The panel is 4¾ x 15 in. and it requires a depth of 13 in. from the front of the mounting panel. A dividing line separates four switches and a volume-control knob at the top from the less-used controls such as input, selector, bass, treble, balance, and the speaker and power switches in the lower half.

The upper switches are TAPE, RUMBLE, SCRATCH, and VOLUME/LOUDNESS. The INPUT switch has four positions — TAPE HEAD, PHONO, TUNER, and EXTRA, the latter being a welcome change from the usual "AUX." The selector switch offers seven positions—BAL L, BAL R, MONO, STEREO, REVERSE STEREO, L INPUT, and R INPUT.

The "BAL" positions are a Scott feature which combines signals from both channels and feeds them only to either L or R speakers, permitting an accurate balance adjustment between them. The L and R inputs select the input from either channel and feeds it monophonically to both speakers. The other positions are self-explanatory.

Next in line across the bottom are the dual-concentric bass and treble tone controls providing separate control of the channels yet permitting easy control over both channels at once when desired. The last knob on the bottom section is the balance control. The remainder of the section is occupied with the speaker and power switches, a pilot lamp, and a stereo headphone jack—an especially desirable feature in these days of headphone popularity.

The rear panel mounts a power fuse and two speaker fuses, two convenience receptacles—one switched and the other not — a derived center-channel phono jack, tape recorder feed and output jacks, four pairs of inputs for TAPE HEAD, PHONO, TUNER, and "EXTRA." Also included are a grounding terminal, a slide switch for each channel to adjust for speaker impedance— either 8 and 16 ohms or 4 ohms, and a three-position slide switch to adjust phono input sensitivity. These last three switches are especially desirable, since the user may have two speakers with different impedances—or perhaps he wishes to parallel another speaker to feed a different location, and thus requires a different output impedance—and not all phono cartridges are of the same output level, though many amplifiers make no provision for this condition. In the 260, the SENSITIVITY switch has three positions which adjust the amplifier (by a change in the preamp feedback circuit) to give rated output at 3-, 5-, or 9-mv inputs, respectively. In the least-sensitive position of the switch, preamp overload is satisfactorily high at 63 mv, while there is still adequate gain in the most-sensitive position for the lowest-level cartridges. The 9 mv position will be fine for most cartridges. This phono overload point has become the first parameter we measure, since we have encountered some units which have been disappointing in this figure. It is our opinion that the preamp overload signal should be at least 40 mv, since with average cartridges and records, this value is reached more than occasionally. This measurement is made at 1000 cps, and the overload point diminishes rapidly as frequency is lowered.

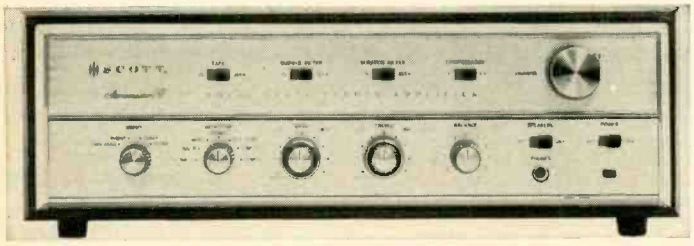


Fig. 1. H. H. Scott Model 260 solid-state amplifier.

Circuit Description

The two channels of the 260 are, of course, identical, and each employs 11 transistors, mostly silicons. The preamp section uses three—two 2N2926's and one 2N2613 or 2N508A. Equalization is provided in the feedback circuit, as is also the sensitivity change previously described. This is followed by one section of the input switch and the tone-control amplifier, which uses two more 2N2926's. The tone control circuit is similar to the Baxandall in that the frequency discrimination is provided by feedback. The scratch and rumble filters are also incorporated in this section. The driver section comes next, and employs three selected 2N3053's and one 2N-398B, the latter a PNP unit used as a phase reverser. This section feeds the single-ended push-pull output stage using a matched pair of 2N3055's or 2N-3235's mounted on a large heat sink. Bias and balance adjustments for the output section are provided in the driver amplifier. No transformers are employed in the audio circuits, and though this somewhat complicates the design, it does result in a fine amplifier with a minimum of phase shift throughout. The accommodation for differing speaker impedances is a switchable network in the feedback circuit from output to the base of the first transistor in the driver section. Coupling to the speaker from the common point of the output pair is by means of a 2000-μf capacitor to give good low-frequency response. The derived center channel has an impedance of 4700 ohms, the value of a resistor to ground from this point, which is fed by an 82,000-ohm

resistor from the two speaker lines. The speaker terminals are fused to prevent any damage to the output stages in case of a short in the leads—an open circuit makes no difference, apparently, since the speaker switch simply opens the circuit without substituting a dummy load. The headphone jack is fed through a 220-ohm resistor from each speaker lead.

The power supply uses two silicon rectifiers, 2250 μf of capacitive filtering, and one 27-volt Zener diode to stabilize the low-level stages.

Performance

As we have learned to expect with Scott equipment, the 260 lives up to its specifications—even exceeding them in places. We measured 0.8 per cent total harmonic distortion at 45 watts (sine-wave) output, while the specifications claim only 30 watts. With both channels operating simultaneously, we measured 40 watts per channel at 0.8 per cent THD. At the more usual output level of around one watt—adequate with efficient speakers—we measured a THD of only 0.15 per cent, which is certainly exceptionally good. IM was less than 1 per cent at rated power (60 and 7000 cps, 4:1).

A signal of approximately 0.5 volts is available to feed a tape recorder, and rated output from the amplifier is achieved with only 2 mv input from a tape head. 3, 5, and 9 mv, respectively, will provide rated output from the phono input at three settings of the sensitivity switch, while the high level inputs require approximately 0.5 volts for the same output. The scratch filter is down about 7 db at 10,000 cps, commencing to roll off at 3500 cps. The rumble filter is down 11 db at 50 cps, with the effect commencing at about 125 cps. Loudness compensation measured 8.7 db at 50 cps, and the tone controls provide a boost and cut of 10.5 db at 10,000 cps, and 13.3 db boost and cut at 30 cps.

These symmetrical figures betoken considerable care in the selection of values in the tone-control circuits, and the over-all design appears to be conservatively done—both electrically and mechanically.

Listening and Operation

Until someone finds out how to derive adequate aesthetic pleasure from meters or an oscilloscope, the ultimate proof of a hi-fi component is in the listening. Second to this is how it handles. If an amplifier sounds good but is poorly arranged or the switches are difficult to operate or the volume and tone controls have the wrong taper, the user is likely to become disenchanted after a few hours of even delightful listening.

The 260 has "nice manners" in operation and we certainly could find no fault whatever in its handling. We were pleased at the solid bass, resulting largely from the high damping factor that seems to be the reason for the so-called "transistor sound," which might be described as a "tightness" or "dryness." This type of sound results from a complete elimination of loudspeaker hangover. High-frequencies from such instruments as violins and oboes have a silky smoothness which is pure joy to hear in any reproduction.

Now may be the time for all good audiofans to convert to solid-state amplifiers—and if you are thinking of buying any amplifier, the 260 is bound to be a most satisfactory choice. **Circle 208.**

BOGEN B-62 TURNTABLE

The Bogen B-62 is not a new turntable; rather it is a significant updating of a well established system. Its direct ancestor was the B-61, a unit that established a good reputation for itself at a very modest price.

The differences between the B-61 and B-62 are not obviously visible: The arm has been redesigned so that it can accommodate a wider range of cartridge weights at the lowest stylus forces; the stylus force adjustment has been altered; the cartridge shell is metal instead of plastic. Otherwise, this is much the same unit as before.

The B-62 is an integrated unit. That is, the arm ard turntable are irrevocably married to each other. The arm is of a static balance type, stylus force comes from unbalancing the arm for the required downward force. The on-off switch is linked to an arm lift device that is completely disconnected when the arm is in play position.

The turntable is really unique. It consists of a 7¾-lb. non-ferrous platter that is driven by a four-pole motor. The motor is linked to the platter by a puck drive on the underside of the platter (not its rim). Accordingly the underside of the platter is accurately machined and polished. Of major interest is the shaft from the motor that drives the puck. Instead of the usual step diameters for the various speeds, this shaft is a tapered shaft with three steps, each step tapered (there are actually four speeds—33 and 45 are on one step). The result is *continuously* variable speeds. Steps are provided for practical purposes, the shaft would have to be too long without them. Continuous speed change is provided from just below 33 to a bit over 80 rpm.

The value of this speed control is obvious to the music lover. Particularly, if he plays along or has a collection of older non-standard speed discs. Precise pitch control is his. At the same time, Bogen recognizes that fishing for an exact speed is not everyone's cup of tea, so they provide four click-in stops for the four popular speeds.

The Tests

As received, the Bogen B-62 was right on speed at 120 volts: at 130 v it became 1.5 per cent fast; at 100 volts it was only 0.5 per cent slow; at 85 volts it became 2.0 per cent slow. These are very satisfactory speed regulation-versus-voltage figures indeed. And remember that the table can be adjusted to *exact* accuracy regardless of voltage.

Flutter measured 0.09 per cent while wow was 0.40 per cent.

Rumble measured 25 db based on 3.54 cm/sec recorded velocity at 1 kc. However, oscilloscope checks showed that the rumble was all well below 20 cps (centered around 15 cps).

Arm tracking error was moderately low. With an Empire 880P cartridge, we measured 1 degree per inch as the arm moved inward. Maximum error at a 6 in. diameter was just under 3 degrees. Arm resonance was very low in frequency (10 cps) and was +5 db. This places it well below the range of recorded music and should cause no performance problems at all.

Listening tests were made to find how far the ear could confirm these measurements. Rumble *is* inaudible, mono or stereo. Piano tones were pure without audible flutter or wow. The arm tracked well at the lowest recommended forces.

This table sells for a mere $64.95. It is solidly built, and appears extremely reliable. And, it performs quite well indeed. **Circle 209 on Reader Service Card**

(*Continued on page 44*)

Fig. 2. Bogen B-62 Turntable