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August, 1960

### Hi-Fi Amplifier

(Continued from page 45)

6550's if anything goes wrong with the bias supply. An RC voltage divider was used to obtain the bias voltage. It is a simple, yet effective, method of obtaining the desired voltage and one that dissipates very little heat. A choke-input power supply was chosen for the 40-watt version because of its excellent voltage regulation as compared to a capacitor input. With a swing in current from 165 to 220 ma., the d.c. voltage will drop less than 20 volts. In the case of the 60-watt version, capacitor input was used to get the higher voltage needed for the extra 2 db of power output.

The bias adjustment ( $R_{b1}$ ) should be such as to produce a cathode current for each output tube of about 75 ma. for the 40-watt amplifier and about 55 ma. for the 60-watt version. The balancing pot ( $R_{b2}$ ) should be adjusted for equal currents in both output tubes.

When connecting the output transformer, careful attention should be paid to the color coding of the primary leads. When the winding is connected properly, it will take approximately 70 volts r.m.s. on the grids of the 6550's for 60 watts of output. When the over-all feedback loop is connected, the output should drop by some 12 db. If motor-boating or oscillation occur, you can correct the phasing by reversing the transformer leads or transposing the connections of the coupling capacitors at the driver.

A word might be said here about how the amplifier sounds, since the final word on any amplifier is whether it pleases the ear and sounds good after prolonged listening sessions. The highs sound clean and the instruments well delineated. The bass is solid and well damped. A large measure of the quality obtained with this circuit should be attributed to the outstanding characteristics of the output transformer and its ability to reproduce full output over such a wide frequency range. —30—

#### D. C. VOLTAGES

PIN	1	2	3	4	5	6	7	8	9
$V_1$	110	—	2.5	—	—	82	—	2.5	—
$V_2$	240	76	92	—	—	92	82	—	250
$V_3, V_4$	—	—	410	410	—	48	—	—	.5

Table 1. Voltages measured by author in 40-watt unit. Voltages in 60-watt version are fairly similar except for somewhat higher "B-plus" and bias on tubes  $V_3, V_4$ .

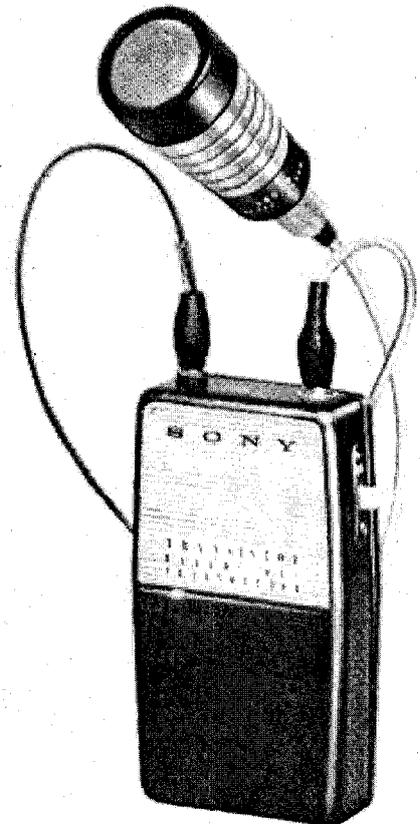
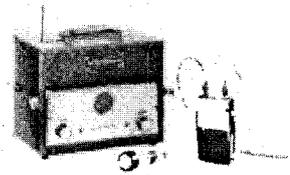
Table 2. Important specs of both versions.

Output	40 watts	60 watts
Sensitivity	.7 volt for full output	1 volt for full output
Response	Down .1 db at 20 cps; down .5 db at 20,000 cps (at 40 watts)	Down .7 db at 20 cps; down 1.3 db at 20,000 cps (at 60 watts)
Feedback	12 db over-all 11 db tertiary	12 db over-all 11 db tertiary
Feedback Stability Margin	20 db	20 db
Damping Factor	10	10

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