BROCINER UL-1 AMPLIFIER, CA-2 CONTROL UNIT, A-100 PREAMP

This series of units—although over a year on the market—is still well up in the running with respect to the quality of reproduction. The power amplifier, *Fig.* 3A, employs the Ultra-Linear circuit, and achieves a power output of 30 watts with only 1.05 per cent IM distortion; at 40 watts, the IM distortion is only 8 per cent. From the standpoint of power output and IM distortion, this amplifier rates as one of the best three tested so far. The preamp and control units are separate chassis, although they are often mounted together as shown in *Fig.* 3B. The A-100 Preamplifier-Equalizer provides four turnover positions, and rolloffs of 0, 4, 8, 12, 16, and 20 db at 10,000 cps. The CA-2 Control Amplifier incorporates a selector switch for four inputs, a volume control combined with the power switch, and step-type bass and treble tone controls. The preamplifier unit normally obtains its plate and filament power from the control unit, but when desired, the former may be had with built-in power supply as model A100-P. The compensation circuits are identical in both models.

Fig. 3A. Brociner UL-1 Ultra-Linear Amplifier.

The power amplifier employs two KT-66's, two 12AU7's and one 5V4G. It provides a 450-volt plate supply to external input units, if desired, together with heater supply of 6.3 volts—the latter being biased 35 volts above ground as a hum-reducing expedient. The power supply is well filtered, using two chokes and a total of 64 μf of filter capacitors. Output impedances of 4, 8, and 16 ohms are available. The performance curves of the amplifier are shown in the bottom section of *Fig.* 4, and the schematic is shown in *Fig.* 5. The schematic of the control unit is shown in *Fig.* 6. The performance curves for the preamplifier are shown in the upper section of *Fig.* 4. With separately controllable low- and high-frequency equalizations, it should be remembered that any of the four low-frequency curves may be combined with any of the six high-frequency rolloffs. In addition, there is a flat position for use as a microphone amplifier which may be used with any of the rolloffs—an advantage on some occasions to control feedback when the microphone is used in an auditorium.

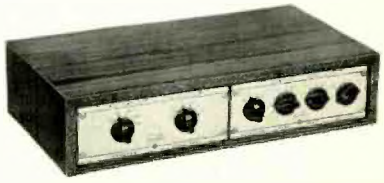

Fig. 3B. Brociner A-100 Preamplifier-Equalizer (left) and CA-2 Control Amplifier.

Equipment Report (Cont'd)

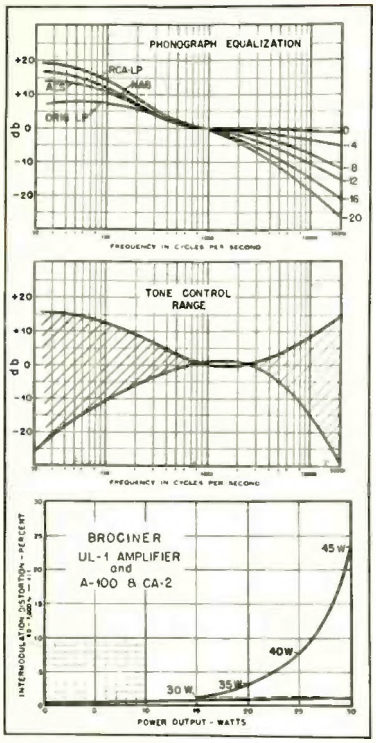

Fig. 4. Performance curves for the Brociner amplifier, preamplifier, and control unit.

An inspection of these curves shows that they cover most of the record equalization curves now in use—the RIAA curve being most nearly approximated by the RCA-LP low-frequency curve and the −12 high-frequency curve.

The curves for the tone controls on the Control Amplifier are shown in the center section of *Fig.* 4. These are somewhat misleading because of the fact that the controls are actually step switches, while the limits or maximum curves are shown. A total of eight positions is provided on each of the controls, which gives sufficient flexibility for the most critical use, and still permits the user to duplicate settings more readily than is possible with continuous-type controls.

At the auxiliary inputs, of which three are available, the control unit and power amplifier are flat within ±0.5 db from 20 to 20,000 cps at the flat settings of the controls. A signal input of 0.28 volts is required at the auxiliary inputs to provide a 1-watt output from the power amplifier. The power amplifier alone requires an input of 0.47 volts to give an output of 1 watt.

An input signal of .002 volts is required at the phono input jack to give the same 1-watt output from the power amplifier, and a signal of only .00003 volts will give a 1-watt output from the microphone jack —sufficient gain to work with a low-impedance broadcast-type microphone.

In listening tests, the operation of the amplifier was considered smooth, free from pops when switching equalization or from input to input. This is an important point when using the presently popular super-high-frequency units, since the pops or switching clicks are composed largely of high-frequency transients which can permanently damage the delicate voice-coil suspensions of these units.

A hum-adjusting potentiometer is provided on the control amplifier chassis. This is a potentiometer across the heater leads to allow adjustment for minimum hum. The heaters are biased approximately 133 volts above ground, and the control range of the hum adjusting potentiometer is greater than 10 db from optimum position to the poorest.

A tape recorder output is provided ahead of the volume control—providing a signal of approximately 2 volts for normal inputs. The control amplifier power supply employs selenium rectifiers, and is well filtered. A power receptacle is available for plugging in the power amplifier, and on its chassis two more outlets are available for phonograph motors, tape recorder, or other accessories.

The input circuit of the preamplifier-equalizer unit is somewhat out of the ordinary in that it provides for both constant velocity and constant amplitude pickups. All magnetics fall in the first class while the Weathers capacitance pickup and crystal and ceramic units are of the second type. The circuit provides proper termination for all current types of magnetic pickups.

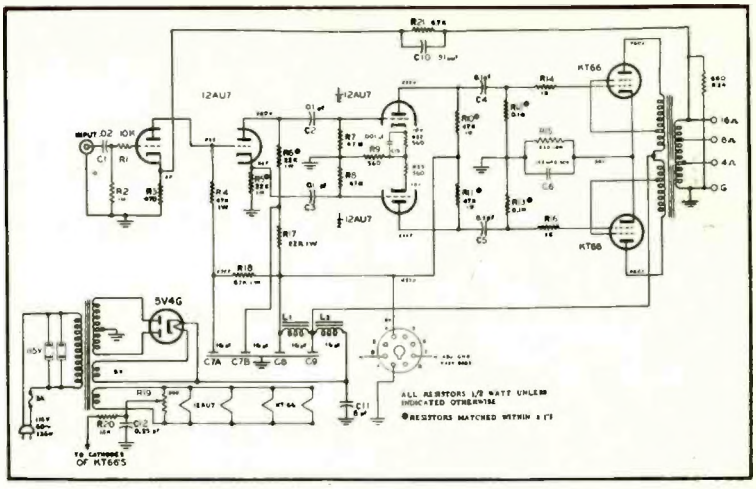

Fig. 5. Schematic of the UL-1 power amplifier.

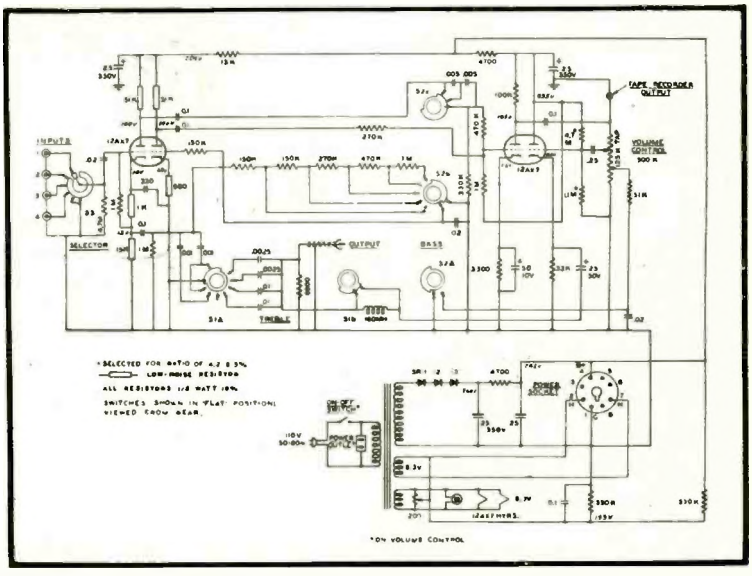

Fig. 6. Schematic of the CA-2 control amplifier.

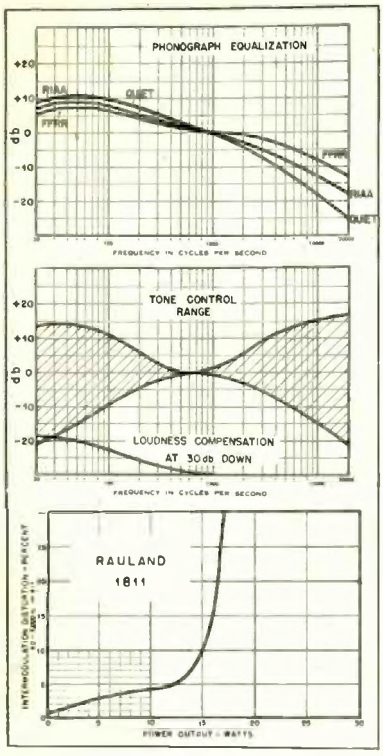

Fig. 7. Performance curves for the Rauland 1811 Amplifier.

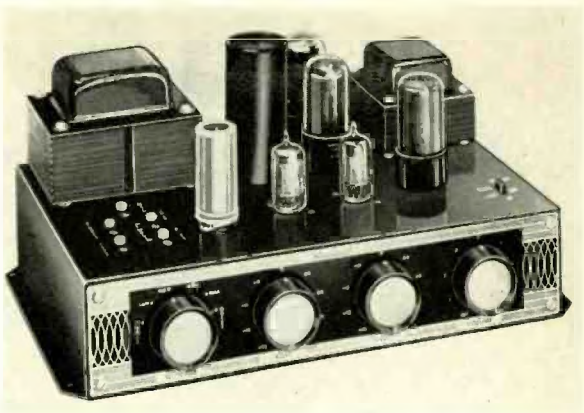

Fig. 8. Rauland Model 1811 Amplifier.

RAULAND 1811 AMPLIFIER

The continuing interest in high fidelity music reproduction in the home has resulted in some excellent amplifiers at prices low enough for anyone. Fortunately for the buyers, simplification in amplifier construction has been the natural outcome of the reduction of the number of recording curves in actual use, and this has been followed by lower costs. And for all but the old-timer who has been collecting records for ten years or more, as few as three equalization curves are sufficient.

The Rauland 1811 amplifier provides all the flexibility necessary to the average hi-fi enthusiast in a compact single-chassis unit that is easily installed. It consists of only six tubes, including the rectifier. The first tube, a 12AX7, is a fairly conventional preamplifier with feedback around the second half of the tube to provide the equalization. The first half of the second 12AX7 serves as a cathode follower to drive the tone-control circuit; the second half is a voltage amplifier. The third 12AX7 is arranged as a voltage amplifier and a cathode-follower type of phase splitter. The fourth and fifth tubes, 6V6's, are the output stage; the sixth is the rectifier.

Two phono inputs are provided—one with 27,000-ohm termination for Pickering pickups, and the other with 49,000-ohm termination for Audak, G.E., and the Fairchild transfomer. A microphone input is also provided, the input impedance being 1 megohm at this Jack. Low-gain inputs are provided for radio tuner and for the output of a tape recorder or other high-gain signal source. *Figure* 8 shows the appearance of the unit, with its gold embrossed control panel.

Performance curves for the amplifier are shown in *Fig.* 7. IM distortion is about normal for 6V6 amplifiers, and the range of the tone controls is conventional, as will be observed by comparison with other response curves.

Equalization curves for the phonograph input are slightly more gentle than most current amplifier models, and some use of the low-frequency tone control is required to provide exact equalization for modern records. However, with such additional bass boost, the correction is completely satisfactory. Loudness compensation is switched in or out of the circuit, the switch being located on top of the chassis. This is a desirable feature since it would discourage continual changing of the setting which is likely to become annoying to one who expects to find the same response every time he turns the amplifier on.

A study of the schematic, *Fig.* 9, shows that the heater supply for the preamplifier stage is 10.4 volts, feeding the 12.6-volt connection of the filaments. Note also that the hum balancing potentiometer is across only this one winding, and that it is biased 23 volts above ground, being connected to the cathodes of the output 6V6's. The lower voltage on the preamplifier stage results in less tube noise in addition to lower susceptibility to hum disturbances.

Signal inputs of 0.15 volts are required at the tuner and tape jacks to provide a 1-watt output with the volume control at maximum and the tone controls set for flat response. This indicates that if any of the newer types of ceramic pickups were plugged into the tape jack there would be sufficient gain to give adequate output for any application. At the magnetic phono input jacks, a signal of .008 volts is required for an output of 1 watt, and at the microphone jack the signal required for the 1-watt output is .011 volts—easily supplied by any of the high-impedance microphones commonly available. Bass and Treble controls are of the continuous type, with the escutcheon marked with approximate calibrations from – 16 to + 16, which corresponds closely to the response at 50 and 10,000 cps. Available output impedances are 8 and 16 ohms. Power consumption at the standard 1-watt output was measured at 45 watts.

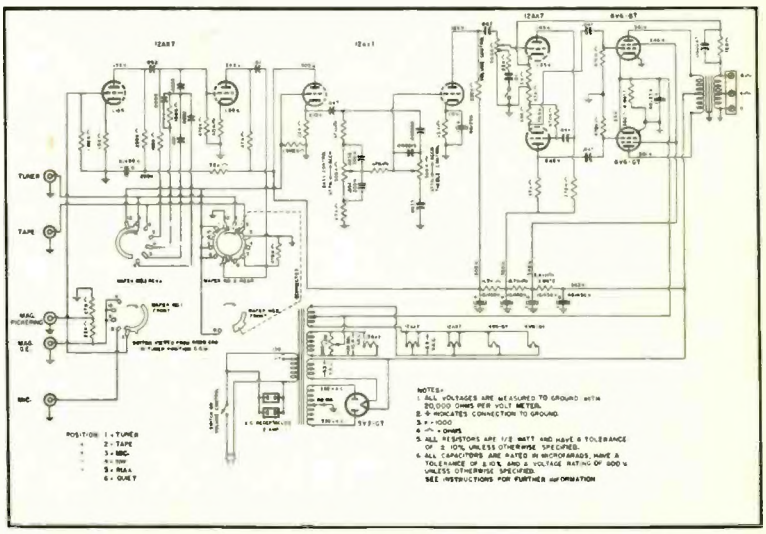

Fig. 9. Over-all schematic for the Rauland 1811 Amplifier.