

Fig. 2. Altec Lansing "Royale II" Solid-State Stereo Amplifier, Model 360A.

ALTEC LANSING "ROYALE II" SOLID-STATE STEREO AMPLIFIER, MODEL 360A

Professionals in the recording and broadcasting industries know that Altec has been making solid-state amplifiers for some time now—for professional use only. The "Royale II" reflects the experience Altec has achieved in making those amplifiers.

Surprisingly enough, Altec has been making solid-state equipment with relatively little fanfare—certainly it is surprising in view of all the fuss that is being made in this area. Of course, when one realizes that Altec is related to Ling-Temco Vought, Inc., one can understand their advanced knowledge of solid-state devices plus their relative reticence.

Now to the 360A.

The Altec 360A is a 70-watt (IHF) stereo amplifier with a full complement of stereo controls, and facilities for functioning as a complete stereo control center for phono, tuner, tape, microphone, or whatever. In addition it provides switching facilities for recording from all those sources, and monitoring during recording through a stereo headset.

The controls on the front panel include:

Input selector; ganged gain control with power switch; independent, concentric (friction coupled) bass and treble; blend; balance; rumble filter; stereo-mono; tape monitor; channel reverse; high-low gain; loudness compensation; scratch filter; phase reverse; and headphones. On the rear panel there are speaker impedance-selector switches and a magnetic-ceramic phono input selector.

All the inputs and outputs (except for headphone output) are located on the back panel and chassis. The inputs include: magnetic or ceramic phono; tape head; microphone; tape machine; tuner; and auxiliary. The outputs include: left, right, and center speaker; center-channel voltage output; left and right recorder; and the stereo headphone output.

The appearance of the "Royale II" is a rather handsome blend of gold and brown, the panel and knob-edges being brushed gold, and the knob-faces, switches and markings being brown. Obviously, a designed appearance, rather than the "evolved" kind we sometimes get in highly-technical products such as this.

Circuit Description (See Fig. 3)

The low-level inputs of the 360A—phono,

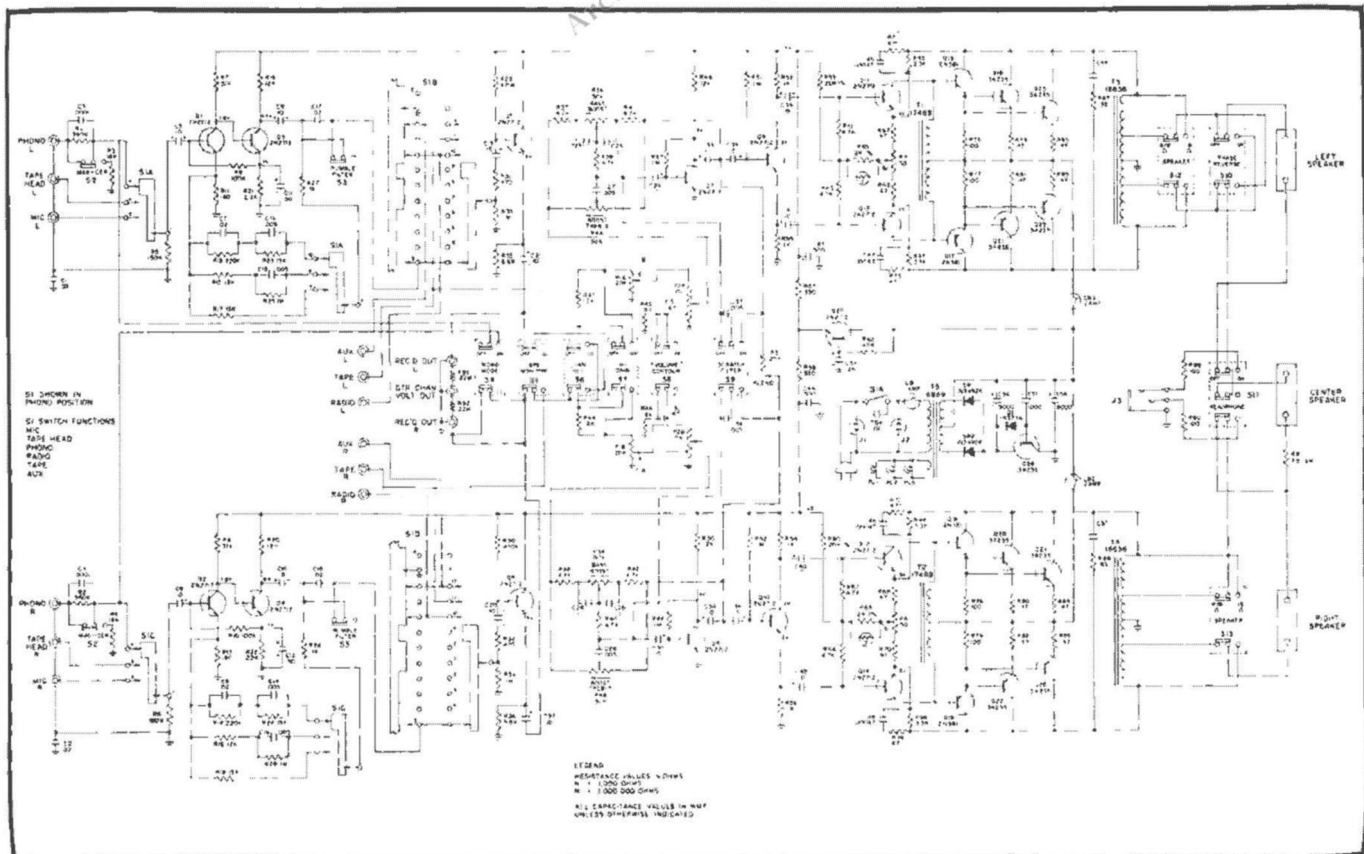


Fig. 3. Schematic of the Altec 360A.

tape head, and microphone—all have an input impedance of 47,000 ohms. These inputs feed a pair of 2N2712's in cascade, feedback around the pair providing the necessary RIAA or NAB equalization. The signal is now high enough in level to join the high-level inputs (impedance 250,000 ohms): radio, tape, auxiliary. All signals are now fed through two more stages of gain (both 2N2712's), with the tone and other special circuits between them. Then comes a phase splitter, another 2N2712, which feeds the pre-driver, a pair of 2N2712's. The bias for this stage is regulated by means of a thermistor. A driver transformer follows this stage, which is in turn succeeded by another pair of drivers, 2N381's for a change. The output stage consists of four RCA 34235's which are loaded by a choke with a grounded center tap. Thus the output is balanced to ground. The outside taps of the choke provide a 16-ohm impedance for 16-ohm speakers, another set of taps provide matching for 4/8-ohm speakers. With this arrangement the output transistors are safe unless the speaker terminals are shorted. Even then, because of the fast-acting automatic circuit breaker the supply circuit is instantaneously opened when the output stage draws too much current.

The power supply is extremely stiff and well regulated, utilizing two transistors as regulators. A third circuit breaker is located in the primary circuit of the power transformer. This one is also automatic.

Performance

The power output of the 360A averaged 40-watts (HIF) per channel up to 10,000 eps, and then averaged 35 watts per channel up to 20,000 eps. Frequency response from 20–20,000 eps was within 1 db, actually being within 0.5 db throughout most of the range. The noise level at the auxiliary input for 25-watts rms output was down 82 db; at the magnetic phono input, for the same output, it was 65-db down; at the tape head input it was down 55 db. The input sensitivity for an output of 25-watts rms at 1000 eps and with the gain switch in "hi" was 380 mv at the radio, tape, and auxiliary inputs; 5 mv at the magnetic phono input; 2.1 mv at the tape head input; and 6 mv at the microphone input.

Distortion was less than 1.5 per cent for an output of 25 watts rms (both channels driven) from 20–14,000 eps. From 14,000–20,000 eps total harmonic distortion increased gradually up to 3.7 per cent at 20,000 eps.

In listening tests the 360A revealed the sound that professionals have been hearing for some time, at least those who use the 351 amplifier. There is a smoothness and musical quality which is certainly desirable in an amplifier, and provides non-fatiguing listening. The Altec "Royale 11" is not inexpensive, about \$360 list, and it certainly deserves a hearing. **D-2**