

## AMPEX "600" TAPE RECORDER

Occasionally referred to in Ampex' own literature as a "portable"—possibly because it is in a case with handles on it, which is the definition used by many—the new model 600 still remains a true Ampex, only in a smaller size. It is available in a handsome luggage case, but is also to be offered in chassis form alone for those who will want to build an Ampex into their home systems.

The 600 can, by anybody's standards, be called a professional machine, for it is performance that rates a product, not size. And the new 600 certainly performs like a professional. Reproduction from a standard Ampex alignment and frequency tape, #5563, shows output to be within  $\pm 1$  db from 50 to 10,000 cps and recording from the output of an oscillator and playing back from the tape shows a response which varies not more than 2 db from the 1000-cps level from 24 to 12,000 cps, and down only 4 db at 15,000 cps.

The recorder in its carrying case weighs only 26 lbs, and the case carries the power cord, and two 7-in. reels. The 600 consists of two chassis—one the tape transport unit, and the other the amplifier. Molded rubber hold-down knobs keep the reels in place, and are easy to use and very effective. The recorder is assembled onto a die-cast panel, and is of rugged construction. It uses a single motor, with belt drive to the operating mechanism, and the reel spindles are shifted slightly to contact the rubber driving rollers for the various operating modes. The unit will operate either vertically or horizontally.

The amplifier unit consists of two separate amplifiers—the record section, and the playback section. In the former—as will

be seen from the schematic, Fig. 7—the low-level input feeds into the first stage, with the line-level input being fed to the volume control in the grid circuit of the second stage. Two separate controls permit mixing of the two inputs. While normally arranged for use with high-impedance microphones, the chassis is provided with a punching and suitable wiring to permit the installation of an input transformer so as to accommodate low-impedance microphones—the additional transformer being available as an accessory. The first three stages of amplification are followed by two additional stages which introduce the frequency correction required for the recording operation, the monitor circuit being tapped off ahead of any frequency-correction circuits.

Since the recorder has three heads—erase, record, and playback—one can monitor the actual recording while it is being made, as with most professional machines. This requires a separate playback amplifier—consisting of two stages with the low-frequency boost necessary for tape playback. A switch permits selection of INPUT or TAPE to feed the monitor circuit, which consists of another amplifier stage and a cathode follower. The VU meter is connected across the output of the cathode follower, and monitoring phones are fed from the same point, using a 10,000-ohm isolating resistor. No panel control is provided for the playback circuit, but internal controls permit adjustment of playback level to match that of the input circuit so that the monitor and meter can be switched from INPUT to TAPE with no change. The bias and erase oscillator operates at approxi-

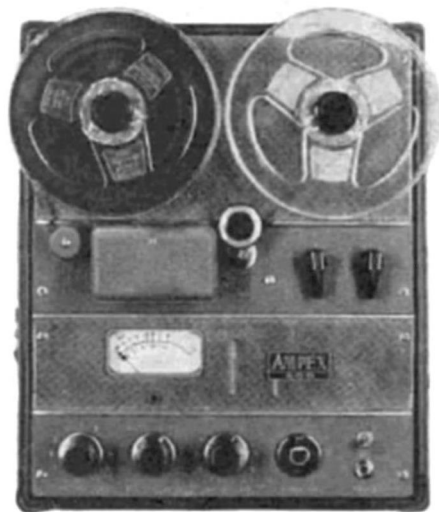


Fig. 6. The Ampex 600 Tape Recorder.

mately 54 kc; power consumption is 75 watts when recording; rewind and fast-forward time is 85 seconds for a 1200-ft. reel. At the LINE INPUT jack, a signal of 0.26 volts at 1000 cps will give 100 per cent modulation; the monitor output for the same signal is 1.4 volts into an open circuit.

Aside from its more obvious professional uses, this machine would be a welcome addition to any home system where quality is of paramount consideration. The "detector" output of any good tuner could feed the line input satisfactorily, and results would certainly please the most critical user.

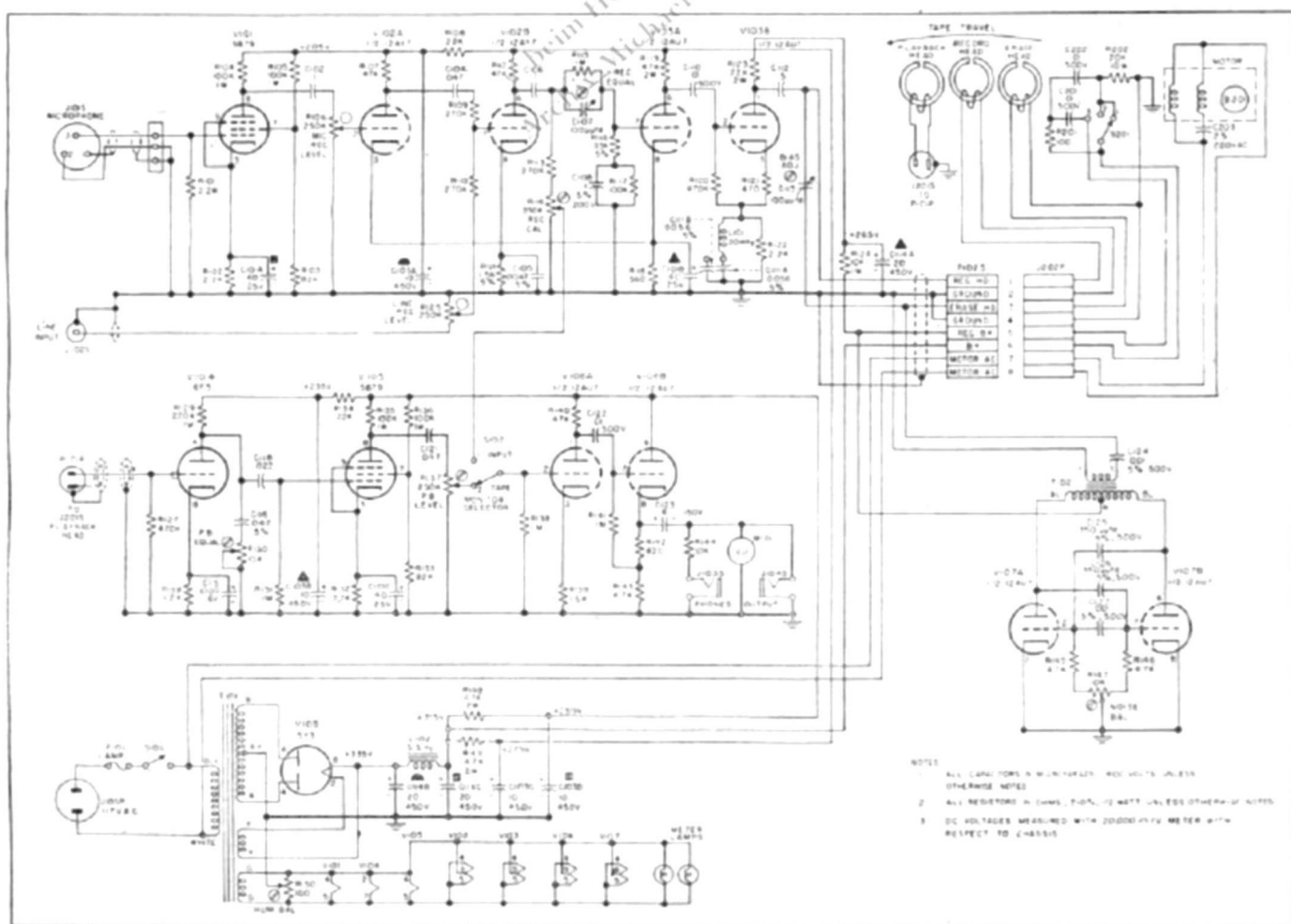


Fig. 7. Complete schematic of the Ampex 600 recorder.

## AMPEX MODEL 620 AMPLIFIER-SPEAKER

This is a rather surprising little "box of tricks," for one familiar with audio equipment is likely to be skeptical of a loudspeaker mounted in a cabinet about one half cubic foot in content. But the specifications claim that the unit as a whole gives an acoustic output which is essentially flat and free from dips and peaks from 65 to 10,000 cps, and performance lives up to the specs quite well. The loudspeaker mechanism is a heavy-duty 8-in. model with an unusually large magnet assembly mounted on a cast frame. It is enclosed in a compartment about 12 in. square by 5 in. deep, with rock wool acoustic treatment inside. The over-all dimensions of the entire unit are 13 x 16 x 8 in., which includes the amplifier.

The trick—if we may call it that—in obtaining good low- and high-frequency performance from such a small enclosure lies in equalizing the amplifier to complement the natural characteristic of the speaker and enclosure. This is done in the feedback circuit when the built-in loudspeaker is being used, but when an external

speaker is plugged in, the equalizing network is replaced by a flat network—a resistor—which makes the amplifier flat within less than 1 db from 20 to 20,000 cps. However, when used with the internal speaker, the response of the amplifier—with the equalizing control set at 0 or flat—is modified to that of the dotted curve in Fig. 7.

The amplifier consists of three stages: a 5879, which is preceded by the volume and equalization controls, a 12AU7 "long-tailed pair" phase inverter and driver which is direct connected to the plate of the 5879, and a pair of 6V6's in push-pull. Feedback is returned to the cathode of the first stage. 1-watt output is obtained from an input of 0.22 volts at the flat setting of the equalization control, with about 4 db less input being required at either maximum of the equalization control. This latter is not comparable to a tone control, for it has an over-all range only 11 db on the low end and about 7 db on the high end, and should be used only for minor corrections to suit acoustic conditions. The amplifier has a rated output of 10 watts, but delivers up to 13 watts before the IM distortion curve reaches its sharp upward

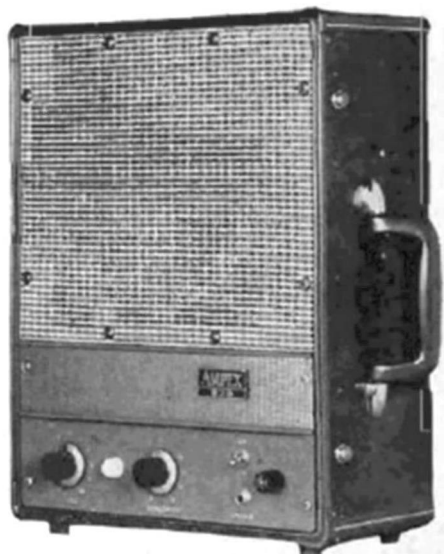


Fig. 6. The Ampex Model 620 Amplifier-Speaker unit in its Samsonite portable carrying case. The cover houses the connecting cords.

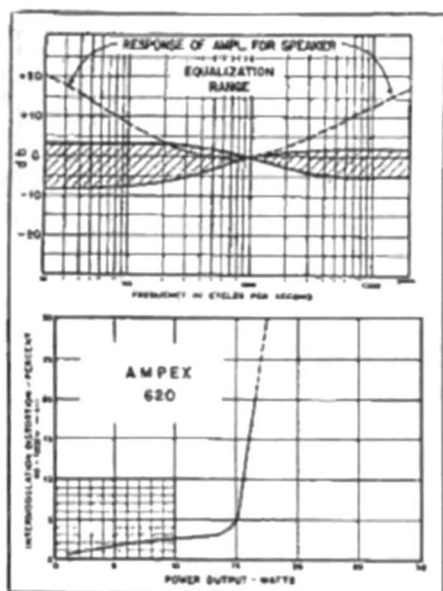


Fig. 7. Performance curves for the Ampex 620.

bend. Below 10 watts, the IM distortion is less than 2.5 per cent, reaching 1 per cent at the 2-watt level, which is more than sufficient level for the built-in speaker. This distortion is considered low for an amplifier using 6V6's.

On listening tests, it was noted that constancy of acoustic output was apparent from 60 to 12,000 cps at normal levels. As the volume was increased, the speaker seemed to "breathe" at the lower frequencies, the point at which the breathing started increasing in frequency as the level was raised. For normally usable levels, however, acoustic output was comparable to many larger speakers, and the whole idea of compensating the amplifier to match the speaker seems to work out to provide an exceptionally successful unit.

The 620 is housed in a Samsonite case which matches in size and appearance the Model 600 recorder, which was reported here in the July issue.