

Everyman's Amplifier

New Low-Cost Ten-Watt Unit Described as the "Ford" of the Hi-Fi Industry.

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Fig. 1. The Masco "Custom Ten" amplifier, finished in black and gold.

THE NEEDS AND DESIRES of the consumer have a way of making themselves known, and as a result of information gathered through painstaking and intensive market research we have developed what is intended to be the "Ford" of hi-fi amplifiers—the answer to this need for a really good ten-watt hi-fi amplifier at reasonable cost.

The Masco Custom Ten amplifier, Fig. 1, provides features usually found only in the more expensive and higher-powered units. It was designed, however, to sell in the

popular price range. Advanced design, unusual features, a high degree of flexibility, above-average performance, and highly decorative styling were combined to provide the unit so urgently needed by the hi-fi enthusiast with a limited (or for that matter, unlimited) budget.

Features

The following features and facilities were all felt to be highly desirable:

1. *Eight-Position Selector Switch*, providing choice of any one of three high-impedance, high-level program sources (such as radio tuner, TV tuner, crystal or ceramic

phone pickup, or the outputs of tape, disc, or wire recorders).

The other five positions of the selector switch work with the magnetic phono pickup input to provide correct equalization for every type of record or tape recording—including the *New Orthophonic* recording curve used by RCA and recently described in the literature^{1,2} and which is likely to become the industry's standard recording characteristic.

The five equalizations,^{1,2,3} provided are labelled "Columbia LP," "Ortho-RCA," "NAB-LP," "78 rpm," "European 78's."

2. *Compensating Slide Switch* to permit accommodation of either high output magnetic cartridges such as Pickering or Clarkstan, or low output pickups such as GE or Audak.

3. *A Special Recorder Output*, which makes available approximately two volts of audio to permit making a tape, disc, or wire recording at the same time that the program is being heard through the amplifier system. The recorder may remain permanently connected to this jack.

4. *Bass- and Treble-Compensated Volume* (Continued on page 98)

¹ EDITOR'S REPORT, AUDIO ENGINEERING, July 1953.

² R. C. Moyer, "Evolution of a recording curve," AUDIO ENGINEERING, July 1953.

³ G. Leonard Werner and Henry Berlin, "New medium-cost amplifier of unusual performance," AUDIO ENGINEERING, Nov. 1952.

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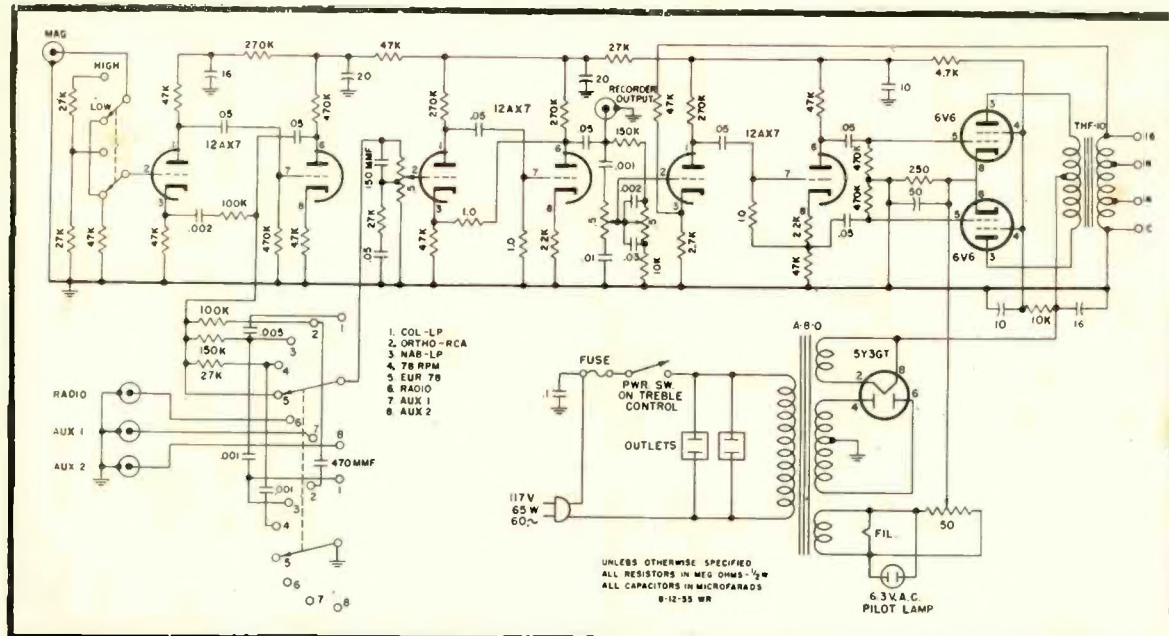


Fig. 3. Schematic of the "Custom Ten" amplifier.

Control. We realize, of course, that the loudness control is a much disputed subject at the present time and that there are those who prefer such a control and those who prefer the standard bass and treble controls. Consequently, we provided what we felt was the best compromise—a bass and treble compensated volume control whose compensation is effective mainly at low volume, plus separate bass and treble controls capable of either completely nullifying the effect of the volume control compensation or adding to it for a higher degree of bass and treble boost or cut.

By actual measurement, the volume control adds 2.4 db bass boost at 50 cps, 0.3

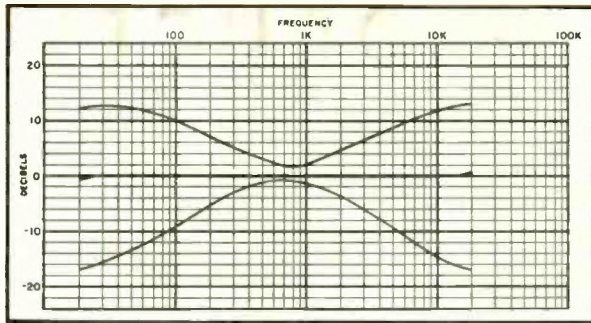
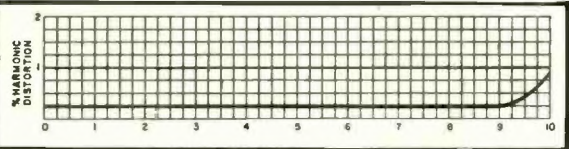


Fig. 2 (left). Limits of tone-control range, providing maximum boosts of around 12 db for both bass and treble, and maximum cut of 17 db at both ends. Fig. 4 (above). Harmonic distortion in per cent plotted against output level in watts.



db treble boost at 10,000 cps, and 0.4 db treble boost at 20,000 cps, when set for 4 watts output at the 800 cps tone control crossover frequency; at 1 watt output the volume control adds 3.1 db bass boost at 50 cps, 1.6 db treble boost at 10,000 cps, and 3.7 db treble boost at 20,000 cps.

As can be seen from Fig. 2, the tone controls provide 12 db of bass boost and 14 db of bass cut at 50 cps, and 13 db of treble boost and 17 db of treble cut at 20,000 cps. These operating data thus indicate that it would be possible to equalize almost any type of recording characteristics by the combined action of the compensated volume control and the bass and treble controls alone.

However, the provision of fixed equalization networks makes the use of tone-control equalization unnecessary, allowing these controls to provide for varying the tonal response of the amplifier to make up for taste differences and to provide a closer approach to the Fletcher-Munson hearing characteristic than is possible by loudness controls alone.

Circuit configurations of the volume control and bass and treble controls can be seen in the schematic, Fig. 3.

5. *Beauty of Appearance* was considered to be a necessary adjunct to, and suggestive of, beauty of function. The "Custom Ten" chassis is finished in black and tube shields and hardware are finished in gold to provide an attractive appearance. Screening of the front panel is in gold set against the black background, and the panel is removable for console cabinet mounting.

6. *Additional Features* which will prove popular are the provision of a set of extension shafts for the controls to make up for varying panel thicknesses in custom cabinets, and a pilot light socket and plug for remote pilot light installation.

Functional Characteristics

As to performance, the "Custom Ten" is designed to be an excellent work-a-day amplifier with response characteristics and hum and distortion figures commensurate with its use with the best modern hi-fi accessories.

Power output of the "Custom Ten" is ten watts at less than 1 per cent distortion (see Fig. 4.) Response is 20 to 20,000 cps \pm 0.5 db. Hum and noise are 80 db below full output. A hum-balancing control provides positive d.c. bias for the heaters to effect considerable hum reduction.

Amplifier stability is evidenced by the use of more than 15 db of feedback around the output transformer and three amplifier stages to minimizing distortion and to provide the high damping factor needed to reduce speaker distortion.

Summing up, the "Custom Ten" has been described as a ten watt hi-fi amplifier of good frequency response and low distortion having such desirable features as: complete provision for recording equalization, all the

needed flexibility of tonal variation, three inputs for high-level program sources, one input for either of the two basic types of magnetic pickup, separate output for tape

recorder, and beauty of appearance. Provision of these features at low cost should make the "Custom Ten" the "Ford" of hi-fi amplifiers.