

FOR GOLDEN EARS ONLY

• *The Regency HF-80 amplifier;
Pickering cartridge and tone arm;
new records review*

By MONITOR

RAPID expansion of the high-fidelity market into the mass consumer field has accelerated the design and production of simple, small, inexpensive units combining equalization, tone control and amplifier functions. They require only speakers, tuner and record player to make a complete system. Some of this equipment meets the standards of genuine high fidelity for home use surprisingly well. An excellent example is the Regency HF-80 (Fig. 1), the lowest-priced unit in Regency's new line of hi-fi components.

The essential performance factors are shown in Fig. 2. Curve A is obtained by positioning the controls as follows: volume, full on; bass, a third on; treble, a quarter on. This "flat" position was determined by feeding 200- and 2,000-cycle square waves into the amplifier and adjusting the controls for flattest tops. Curve B was obtained with the bass and treble controls in the center position. Curve C is for maximum boost of bass and treble and curve D for maximum cut of bass and treble. The range of the tone control is clearly very wide.

Four square-wave responses (Fig. 3), taken in the flat position with 500-mw output, are shown and indicate a very acceptable transient response within the audio range. There was no sign of ringing or any other type of instability.

The power output curve (Fig. 4) was obtained by feeding an input signal at 15 different points in the frequency range from 20 to 30,000 cycles, increasing input until the scope trace showed clipping or distortion. The curve is flat from 50 to 30,000 cycles. Below 50 cycles the power output falls off to 8 watts at 30 cycles and just under 4 watts at 20 cycles before distortion shows up. This might limit the usefulness of the amplifier in applications—such as schools or small cafes—requiring high average power levels. But it is fully adequate for average home use and will take care even of the occasional demonstration at "full

concert-hall level," particularly since almost no records or broadcasts produce anything below 30 cycles.

Fig. 5 shows the distortion curve from 100 mw to 10 watts. In comparing these figures with those of quality amplifiers *without* control units, keep in mind that these curves give the overall distortion, including that contributed by the tone-control stages—everything but the phono preamp, in fact. This is the lowest distortion I have registered on any commercial 6V6 amplifier.

These are excellent curves; indeed as good or better than those obtainable with top components and designs a brief two or three years ago. They are improved upon in higher-priced equipment, principally in a flatter power curve below 50 cycles and a better square-wave response. The practical utility of both improvements for average home use is debatable and is obtainable only at a much higher price and larger size.

The amplifier listens as well as it tests. It is very clean in the high end and the definition and transient response are very good throughout the range. A slight deficiency in the very low bass end, at very high outputs, is evident when highest-quality speakers are used. With run-of-the-mill systems which are "flat to 50 cycles" and cut off below 40 cycles, the sound is excellent all the way and I would judge that it is completely acceptable to all but the crankiest of listeners.

The HF-80 provides three high-level input channels for tuners, tape recorders or TV, and a single input with a two-position equalizer for magnetic pickups loaded with a 47,000-ohm resistor. The curves of Fig. 6, obtained with a Pickering turnover cartridge and the Dubbings 101 test record, give the response of the phono channel. Position 1 yields excellent results with all four standard American curves. The bass-boost curve apparently is on the AES slope, which accounts for the small boost at the low end and the

slight dip around 250 cycles. Most G-E cartridges will show a little more slope at the high end, just about flattening the LP and NARTB curves and producing slight rolloffs with the RIAA and AES. A rumble filter can be actuated by a switch on the chassis and is very effective without much effect on the musical range.

Some readers may be at a loss to account for this excellent performance since there is nothing remarkable about the circuit. The answer is very simple: although the resistors are standard 10% and 20% units, the pairs in push-pull stages are matched on comparison bridges to 1% or better, and the output tubes are also matched closely.

The unit is very compact, light and dissipates little heat; can be put in a restricted space easily. The craftsmanship is excellent for a production unit. Despite the shallow and small chassis, individual components are easily accessible for replacement. All in all, the HF-80 is an excellent example of how much real high-fidelity quality can be provided at low cost by good design and care in manufacture.

Pickering turnover cartridge and new tone arm

The critical problem in the design and production of highest-fidelity pickup cartridges is providing a flat, smooth and clean response above 10,000 cycles. One of the earliest cartridges to offer a response extending to 20,000 cycles was the Pickering, and its success is well attested by its wide acceptance. Not long ago Pickering issued a model 260 turnover version (see photos) which provides facilities for playing both 78-r.p.m. and microgroove recordings at the turn of a lever. This is actually a combination of two cartridges mounted back to back. The cartridges can be disassembled in a few seconds for use independently if desired. Their performance is exceptional both by measurement and listening.

Fig. 7 is the response, without an equalizer, directly off the pickup ter-

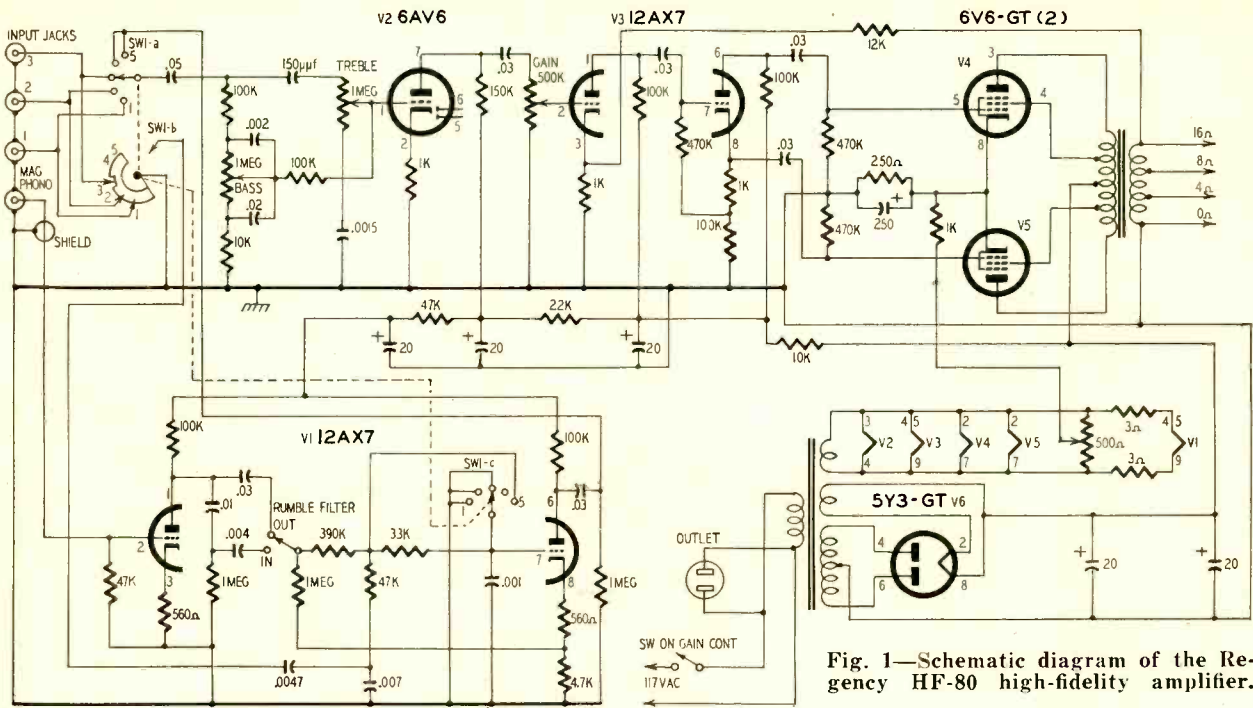


Fig. 1—Schematic diagram of the Regency HF-80 high-fidelity amplifier.

minals on a Cook 10-LP test record into a Heathkit a.c. v.t.v.m. The notable thing about the curve is the extreme linearity. The variations on the curve are largely variations on the test record which varies ± 1 db at various points. You will note that response is down only 1.5 db at 15,000 cycles, 6 db at 17,000 and 8 db at 20,000. Measurements in the range above 10,000 cycles with test records are difficult since various effects due to groove loading may occur. However, it is an entirely safe assumption that the Pickering is at least as good as indicated on the curves and possibly a few db flatter beyond 15,000 cycles.

The linearity is borne out by the curves (Fig. 8) taken with a 27,000-ohm load on the pickup, at the output of a preamplifier. To be sure, such curves are measures of the equalizer as well as the pickup. Nevertheless, they indicate the results which proper equalization can deliver. Again the linearity is very notable. The rise between 10 and 12 kc is not significant and probably represents the result of needle coupling to the grooves on this specific record. This coupling can vary with different record materials and even from day to day on the same record.

The curves speak for themselves. The only thing I need add is this: The sound of the Pickering in the high-high end—beyond 10,000 cycles especially—is exceptionally clean, smooth and sweet. Thoroughly pleasant to listen to, it is free of shrillness when used with tweeters which are themselves clean and sweet. I have used the pickup with several amplifiers and a number of speakers and, as near as I can determine, the pickup has no influence on the character of the high-highs, which will be determined by the characteristics

of the tweeter. On clean records, even those which have been played scores of times with diamond points at low pressures, I found no need for rolloffs. Indeed, it is possible to boost the high end severely and still maintain a clean, sweet sound. This is by no means true of all wide-range cartridges.

I made no measurements at 78 r.p.m. (my available test records stop at 10,000 cycles and up to that point the response was almost an exact duplicate of the microgroove cartridge). But listening tests reveal an exceptionally fine quality and a gratifyingly low scratch level, excellent evidence of a smooth, flat response free from peaks. Clearly the Pickering belongs in the top category of pickups and I can't imagine anyone, even the goldenest ear, being unhappy with it. Models 220 and 240 are available separately for 78- and 45-33 $\frac{1}{2}$ -r.p.m. records, respectively.

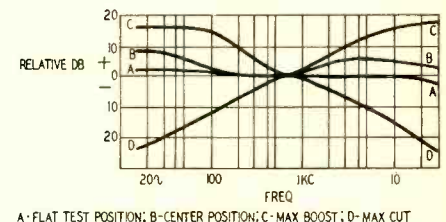
I was able to test the cartridges not only in my tone arms but also in the new Pickering arm (see photo). It is a worthy complement to the cartridges, makes no difference in the quality of reproduction, and is very convenient to mount and to use.

It provides an adjustment for the height over the record. With most cartridges this adjustment can be made so that the needle will just miss the turntable when no record is on it and yet provide good tracking with a record. Pressure is adjustable with a knurled knob underneath the arm (but above the turntable), and the adjustment can be easily made. Incidentally the cartridges tracked with as little as 3 grams, though 5 or 6 grams seem optimum and produce least distortion.

The arm is made in two sections, rather like the G-E in principle. The cartridge mounts on a light small front

section with very low vertical friction. In lifting the pickup off the record, only the cartridge and its mount are raised; the arm remains fixed. The vertical loading is therefore very slight and the arm will track extremely warped records with no difficulty whatever and practically no risk of damaging either record or needle.

The whole arm moves horizontally on fine bearings and has a large counterweight at the rear which tends to damp out resonances, maintains a uniform



A—FLAT TEST POSITION; B—CENTER POSITION; C—MAX BOOST; D—MAX CUT
Fig. 2—Range of bass-treble controls.

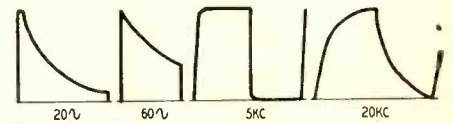


Fig. 3—HF-80 square-wave responses.

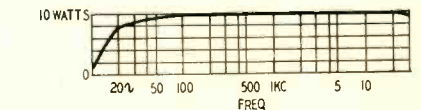


Fig. 4—Power output curve of HF-80.

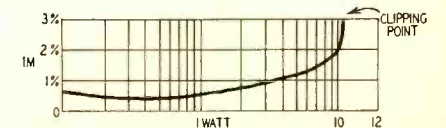


Fig. 5—Distortion curve of the HF-80.

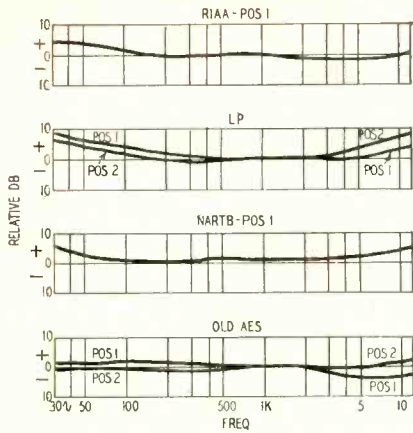


Fig. 6—Response of the phono channel.

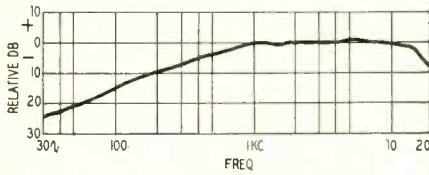


Fig. 7—Response of Pickering cartridge.

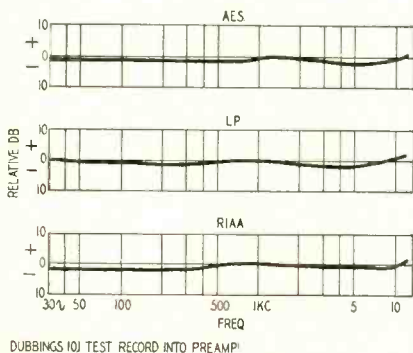
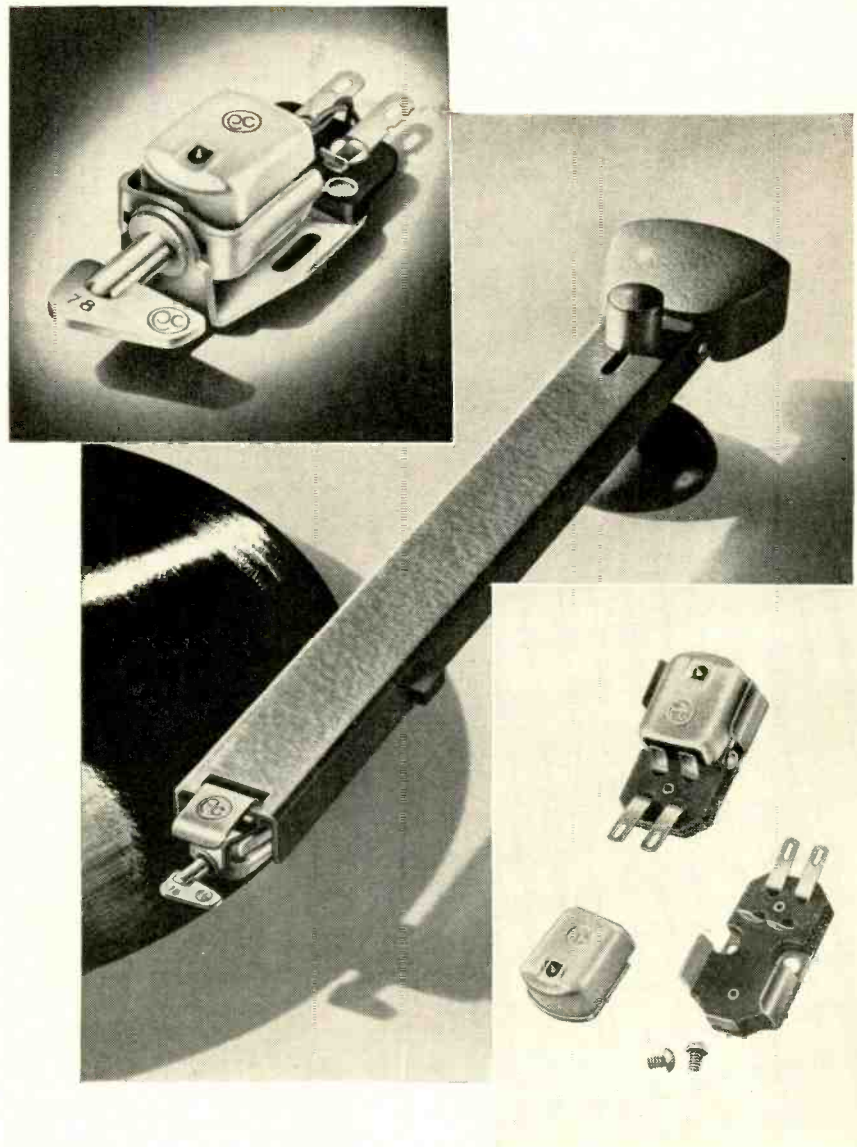


Fig. 8—Curves of the Pickering cartridge at the preamplifier output.

rhythm of movement as the arm travels toward the inside, offers considerable resistance to violent movement imparted by shock vibration, etc. The arm mounts with three screws which can be adjusted to level the arm. The method of holding the arm in the rest position is very clever and convenient. A small bar magnet mounted on the arm attracts it to the "holder" post and keeps it there firmly enough to resist any but the most violent accidental shock. The arm can be used with various other cartridges in permanent or slide mounting.

New records

NOTE: Practically all American records pressed since Sept. 1, 1954, use the standard RIAA curve or some modification of it which will be equalized to within 1 db by an RIAA equalizer. They can be equalized on the bass end exactly by the new RIAA equalizer and very closely with either the LP, NARTB or AES equalizer. Treble equalization is identical with the RCA ORTHO and calls for a slope of 13.7 db at 10,000 cycles. An LP treble equalizer will be -2 db at 10,000 cycles and an AES



The Pickering turnover cartridge (top left) installed in its arm (center). At right below, single-unit cartridges are also available, with 1- or 3-mil styli.

will be +2 db at the same point. The departures at intermediate points will be smaller. Therefore, in a pinch the new records can be equalized within 1 or 2 db by almost any of the four American playback curves: LP, NARTB, AES or ORTHO. Henceforth in my reviews I will not mention the recording curves unless the specific recording departs from the RIAA.

**An Adventure in High Fidelity
RCA Victor LM-1802**

RCA Victor left the pioneering in high-fidelity test records to others. But having at last risen to the challenge, it gives us a really remarkable test recording. Here in one disc is just about everything one needs to test, demonstrate or show off any high-fidelity system.

It starts with *An Adventure in High Fidelity*, a special composition by Robert Russell Bennett. Whatever one may think of it as music, it is

certainly deliberately composed to bring out almost every possible hi-fi effect. The second band, *The Orchestra in a Nutshell*, is a unique test of realism and naturalness, presenting most of the instruments of the orchestra in solo passages from the *Nutcracker Suite*, ending with a short but very fine demonstration of the percussives. The recording of the instruments is extremely faithful to the natural sound and, given a low enough noise level, one can hear not only the characteristic tone of each instrument but often many of the noises which accompany its production. Listen especially for the valving and breathing of the tuba player.

The first band on side B presents an excellent test for frequency range. It gives three switch bands, each succeeding one having a narrower bandwidth. Each test starts with a fast sweep of sine waves over the range covered. This is followed by a portion of *Adventure in High Fidelity* reproduced in the same bandwidth. A comparison of the effect of the three bands will quickly reveal the real range of any system and also demonstrate the difference between hi-fi and ordinary reproduction. However, the comparison is somewhat unfair to hi-fi since the 200-5,000-