

playback levels when used in conjunction with a hi-fi system. With built-in speaker (a 6 by 9 oval), hum will not be noticed.

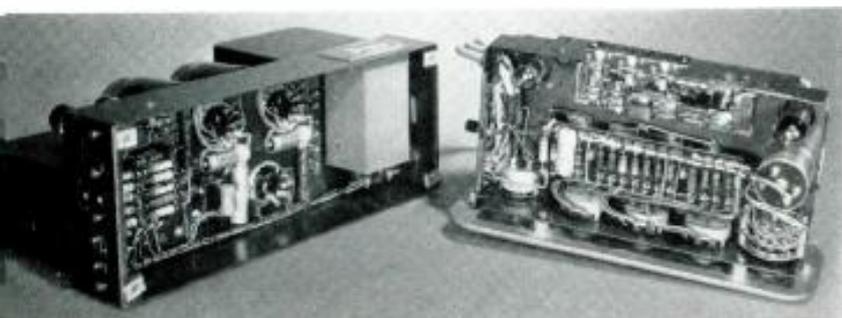
The 303 is a good buy, either as a "packaged" recorder or as a double-duty one: packaged but able to work with a hi-fi system. It is a close second, in this respect, to the 401. — C. F.

Acoustical Quad II Amplifier System

SPECIFICATIONS (furnished by manufacturer): complete amplifying system with separate preamplifier-control unit. **CONTROL UNIT** — **Inputs:** three total; one compensated for phono cartridge, one high-level for tuner, tape recorder, or TV; third is for microphone or another high-level input, depending on plug-in matching network used. **Controls:** AC on-off and volume; **Bass** (-13 to +13 db); **Treble** (-15 to +13 db); **Filter slope;** **Filter range switch.** Also six pushbuttons; four at right are for phono equalization (COL LP, AES, FFRR 78, STD 78), and pushing any one or a combination of these puts the phono channel in operation; two at left are for selection of remaining two channels. **Response:** radio inputs, 20 to 20,000 cycles, $\pm .3$ db; microphone input, 20 to 18,000 cycles, ± 1 db; phono input, within .5 db of equalization curve selected. **Distortion:** on radio input with controls level, .02% at 1.4 volts output; worst possible combination of inputs and control settings, less than .1% for 1.4 volts output. **Hum and noise:** -70 db. **Tubes:** EF86, ECC83. **Dimensions:** 10½ in. wide by 3½ high by 6½ deep. **AMPLIFIER** — **Power output:** 15 watts. **Response:** 20 to 20,000 cycles, $\pm .2$ db; 10 to 50,000 cycles, $\pm .5$ db. **Distortion:** less than .1% total at 700 cycles, 12 watts; less than .25% at 25 cycles, 12 watts. Maximum intermodulation distortion, not more than .4% at 15 watts output. **Hum and noise:** -80 db. **Output impedance:** 15 or 7 ohms. **Tubes:** 2-EF86, 2-KT66, GZ32. **Dimensions:** 13 in. long by 4¾ wide by 6½ high. **Prices:** \$237.50 total; power amplifier only, \$130.00; control unit only, \$120.00. Additional pickup matching plugs, \$2.75 each. **Manufacturer:** Acoustical Manufacturing Co., Ltd. Distributors in U. S., Beam Instruments Corp., 350 Fifth Avenue, New York 1, N. Y.

More and more, good power amplifiers become closer together in performance, so far as the ear can judge. Therefore let it be said simply that the Quad II unquestionably belongs in the field of the very best power amplifiers, it has no critical adjustments, and that our checks show it to be quite conservatively rated, and focus our attention on the control unit.

The QC II is not a "remote control," but is supplied with two 36-in. lengths of cable that plug into the power amplifier. These carry the main AC power and the audio signal from the control unit to the amplifier, and operating power from the amplifier to the control unit. The QC II has no power supply of its own.



Insides of the Quad amplifier and control units look like this.



Quad II amplifier, quality control unit, pickup matching plug.

A number of unusual features are incorporated in this new control, which were evidently well thought out in the design period. The plug-in matching network is a little aluminum can that plugs into a nine-pin socket at the back of the QC II. This adjusts the sensitivity of the phono channel and provides the proper terminating resistance for the cartridge at the same time; accordingly, various units are available for different cartridges. Also, each is available in two types, depending on whether the third input channel is to be used with a microphone or a high-level source.

The real forte of the QC II, however, is its ability to control program noise and distortion without unnecessary loss of high-frequency response by means of the elaborate filter system. There is a fixed sharp-cutoff filter that operates at 20,000 cycles, to remove any high-amplitude peaks in the output of wide-range pickups that might cause distortion of the audible signal. In addition, there is an adjustable filter controlled by two knobs at the right of the panel. Four positions are marked on the switch knob at the right: 10 kc., 7 kc., 5 kc., and Cancel. The first three, of course, correspond to the frequencies at which the filter begins to be effective in those positions. In the last position all the filters and tone controls are removed from the circuit. The knob just to the left of this one is continuously adjustable; it controls the rate of cutoff of the filter beyond the frequency selected. This rate can be any from zero to 50 db per octave! It can be seen that the frequency range passed by the amplifier can be matched exactly to the quality of the source. With practice in their use these controls add much to the enjoyment of music.

No tape output jack is furnished, although instructions are given as to how one can be added easily. The process does, however, involve a soldering operation.

Because the record-equalizer pushbuttons are additive in their effect when pushed in multiple, all the standard playback curves can be matched. Pushing the three labeled AES, FFRR 78, and STD 78, for instance, yields the RCA-RIAA-NARTB standard curve. A table is furnished with the instructions (they are unusually complete, by the way.)

At the end of the control unit are two plug receptacles to furnish operating voltages to tuners or other equipments not having power supplies built-in. A nice feature that could often be useful.

Some American purchasers might wish for more input channels, and some might object to supplying their own AC power cords after putting \$237.50 on the line. But the Quad II is capable, flexible in adaptation, and generally of

the highest quality throughout. For deluxe home music installations, we consider it to be well worth its cost. — R.A.

MANUFACTURER'S COMMENT: Three switched input channels are provided — no more are really necessary, surely? . . . We do, in fact, now supply a power cord, although your comment concerning this point was fair for the unit you received.
