

so lightly, yet quite positively, into the appropriate groove. The control arm is then out of contact with the clip on the pickup arm and the pickup is then free to move across the record.

At any moment desired the buffer can be manually lifted, contact between the clip and the control arm is then resumed and the stylus is lifted clear of the record.

For a device of this sort there are things one wants to know:

1. Does it work as intended?
2. Is it well made?
3. Is it convenient and easy to handle?
4. Is its price such as one can afford?

The first three questions I can definitely answer in the affirmative. The control does its job effectively, it is beautifully made and it is easy to operate. The fourth question you can answer for yourself, bearing in mind the fact that an expensive record can be ruined by a single mishap in putting a pickup on a record by hand, or lifting it off.

Recordergram Major, AG8106. Philips Electrical Ltd. Price 62 gns.

Specification:

Tape Capacity: 5-in. spools (600 ft. or 900 ft.).
Tape Speed: $3\frac{1}{2}$ in./sec. or $1\frac{7}{8}$ in./sec.

Playing Time:

Standard Tape: 2 x 30 min. or 2 x 60 min.
Long Play Tape: 2 x 45 min. or 2 x 90 min.

Level Indicator: Magic Eye.

Microphone: Moving Coil Type.

Cueing Indicator: Bowden cable and rev. counter.

Controls:

Push-button—Record, Play-back. Fast wind and re-wind.

Rotary Switches—Start and stop, Volume and Record level.

Inputs: Microphone, radio and pickup, diode.

Outputs: Monitor (for headphones) and external (as well as internal) speaker (4 to 7 ohms).

Valves: EF86 (2), EL84 (output), ECL80 Erase oscillator, EM34 Magic Eye, EZ30 Rectifier. All Mullard or Philips.

This tape recorder has a number of unusual features which add to its versatility. Most twin-speed recorders give a choice of $7\frac{1}{2}$ in./sec. or $3\frac{1}{2}$ in./sec. speeds. Here the alternative of $3\frac{1}{2}$ in./sec. and $1\frac{7}{8}$ in./sec. speeds has been offered, so that longer-playing times can be secured in a relatively light and portable instrument. And it is really portable and not just transportable like a railway truck.

Of course, the frequency range has been restricted in consequence: at the $3\frac{1}{2}$ in./sec. speed it extends effectively to rather more than 8 kc/s and at the lower speed to rather less than 4 kc/s. This means that the quality obtainable at the higher speed with present-day tapes is rather better than that of pre-war electrical recordings and considerably better than that of an ordinary A.M. radio receiver. The lower speed is not of musical quality but is very useful for speech recordings of telephone standard. There are many occasions when a recording of this standard is entirely adequate.

I should therefore class the Recordergram as a general-purpose instrument, combining the functions of an office machine and a domestic recorder of good, but not the highest quality.

For an instrument of this type, a reliable cueing device is necessary; and here it is in the form of a Bowden wire and rev. counter driven from the spindle of the take-up spool. With a little practice this enables one to pick out a single word in the recording even at the lower speed, and this of course is essential for a shorthand typist. Another desirable feature is the provision of an arrangement for the attachment of an on-off foot switch so as to leave both hands free.

There are separate gain controls for microphone and for radio or pickup inputs. This enables the two inputs to be mixed—a useful device for occasions when one desires to add a commentary to a programme.

The construction has been most efficiently carried out and ease of servicing has not been sacrificed to compactness. The controls are simple and straightforward and during the three months or so that I have had a model on test, have not given rise to any difficulty.

As noticed above, the musical quality is limited to some extent by the tape speeds, but within those limits I have found it quite satisfactory; indeed, the distortion content is on the small side for low-speed operation. Wow, flutter and hum are not in evidence.

Altogether, a distinctly successful instrument, I should say, within the range of its design.

Pamphonic Amplifier 1003. Pamphonic Reproducers Ltd. Price 27 gns.

Specification:

Output Power: 10 watts.

Output Matching Impedances: 3.5 and 15 ohms.

Frequency Response: Substantially flat from 20 c/s to 50 kc/s.

Distortion: 1% at 1 kc/s at 8 watts.

Hum and Noise: Mic., -53db, Pickup, -54db, Radio/Tape, -65db.

Negative Feedback: 20db.

Sensitivity: 2.5 mV to 100 mV, according to input selected.

Selector switch: Mic., Tape, Radio, Pickup (Decca LP), Pickup (N.A.R.T.B.), Pickup (78 r.p.m.)—all velocity characteristic.

Bass control: -16db to +15db at 50 c/s.

Treble control: -16db to +16db at 10 kc/s.

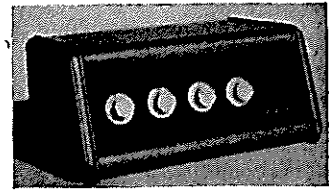
Volume control: graded, with on/off switch.

Auxiliary supplies: 300v, 30 m.a. D.C. 6.3v, 2a, A.C.

Valves: 2 of 6AQ5 Brimar; 2 of ECC83 Mullard; 1 of EF86 Mullard; 1 of GZ32 Mullard.

This is a most interesting amplifier of the "Junior", 10-watt type. Both Control Unit and Main Amplifier are in one rugged metal case of quite handsome appearance, finished in mottled green. It needs no separate housing but can be put on a shelf or in a bookcase. It is thus of ideal shape, size and appearance for the flat-dweller or indeed for any location where space is limited or where a "contemporary" approach is called for.

Although only 6 valves, including rectifier, are used, the circuit is actually of 5 stages with



twin valve, phase inverter stage and push-pull output. Moreover, the various controls are effectively distributed so as to avoid undesirable interaction, and in this way a high degree of stability is assured. Thus only the input selector comes before the first valve (EF86); then between that valve and the first half of the ECC83 come the fixed equalisers for the different recording characteristics; between the two halves of the ECC83 come the bass and treble controls on the now famous Baxendall circuit; then come the volume control feeding the ECC83 in the phase inverter stage; and finally come the two 6AQ5's in the ultra linear push-pull output stage. The output for coupling to the input of a tape recorder is taken from the upper end of the volume control but after the coupling capacitor of that stage. The main feedback loop goes from the secondary of the output transformer to the first cathode of the phase inverter stage.

The more I examine the circuit of this amplifier the more I become impressed with the skill—no, cunning, of its designer. He obviously set himself certain limited objectives as to output, frequency range, size and cost, and he has achieved those objectives with remarkably little distortion at high output and with no surrender of stability. I was particularly glad to see how he had avoided the risk of inadvertent positive feedback to the input stage causing the first valve to become unduly sensitive and therefore prone to self-oscillation.

The carrying-out of the design commands respect. The choice of components, output transformer included, has been quite generous and the lay-out and wiring are beyond reproach. I like the edge-illuminated perspex panel which show up the graduations of the various controls even in the most adverse conditions of lighting.

The performance, as one could only expect, is first class, and entirely adequate to get the best for modern records and F.M. transmissions in ordinary home listening conditions. The fact that there is no steep-cut treble filter perhaps makes it less suitable for some of the older recordings, but the value of such a control is often exaggerated: it is not an adequate answer to excessive surface noise, for example; that, I believe, lies in the pickup and the stylus.

Some readers may wonder whether the record equalisation is the best compromise amongst the many possibilities. For example, I myself would have chosen to have American Columbia pre-standard in place of Decca LP, since the former was one of the extremes. Fortunately, however, it matters little since the Baxendall treble and bass circuit is versatile enough to make up for differences of that sort.

The R.G.A. "Controlled Q" Reproducer.

R.G.A. Sound Services (Plymouth) Ltd. Price 12 gns.

This reproducer consists of a 6 in. by 4 in. elliptical loudspeaker unit mounted in a box 22 in. by 12 in. by 13 in. deep. But one end of the box consists of a vent (with, effectively, a 12 in. neck) to the box. The enclosure volume is thus just under 2 cu. ft.

The box is rigidly made of oak-faced $\frac{1}{2}$ -in. ply and apart from the vent and the speaker

