

broadcasts well reproduced. As far as price goes—the basic record player/tuner/amplifier/small speakers combination costs a total of 94 guineas—I should say this represents good value for money in direct comparison with an equivalent priced stereo radiogram.

JOHN BORWICK.

Philips Audio Plan. Prices: see below. Manufactured by Philips Electrical Ltd., Century House, Shaftesbury Avenue, London, W.C.2.

Makers' Specification:

GA228 RECORD PLAYER

Turntable unit: 4-speed automatic single player. *Wow and Flutter:* 0.25%. *Cartridge:* GP310 crystal turnover type with diamond LP stylus. *Output:* via captive lead with DIN 5-pin plug, 70 mV 0.5 Megohm. *Playing weight:* 3-6 gm. *Dimensions:* 13½ x 9½ x 4½ in. *Finish:* teak veneer with clear plastic lid. *Price:* 16½ gns.

GH925 STEREO AMPLIFIER

Power output: (into 8 Ohms) 2 x 6 Watts music power; 2 x 4 Watts continuous sine wave power. *Distortion:* less than 10% for 4 Watts. *Frequency response:* 40-20,000 Hz ±3 dB. *Hum and Noise level:* -50 dB rel. 4 Watts. *Dimensions:* 12½ x 8½ x 3½ in. *Price:* 23 gns.

GH927 FM STEREO TUNER

Wave range: 87.5-108 MHz. *Audio output:* 200 mV max. *De-emphasis:* 50 microsec. *Sensitivity:* mono 5µV, stereo 26µV for 26 dB S/N. *Dimensions:* 14 x 6½ x 3½ in. *Price:* 35 gns.

GL559 LOUDSPEAKER

Drive unit: 5 in. dual cone. *Impedance:* 8 Ohms. *Dimensions:* 10½ x 7½ x 7½ in. *Finish:* teak veneer. *Price:* 10 gns.

The full scheme of Philips Audio Plan fills in a wide range both in price and in degree of technical sophistication. At the time of writing, the Audio Plan catalogue comprises 15 different units—4 turntables, 3 amplifiers, 3 tuners, a tuner/amplifier and 4 loudspeakers.

It would clearly be impossible to review the full range here and the items submitted by the manufacturer (and listed above) constitute a working, low-price system. The turntable, amplifier and loudspeakers are the least expensive in the range and the FM tuner is medium priced. Bearing in mind, then, that we are here discussing only the floor level, so to speak, of the Philips Audio Plan, let us begin with a description of the units tested.



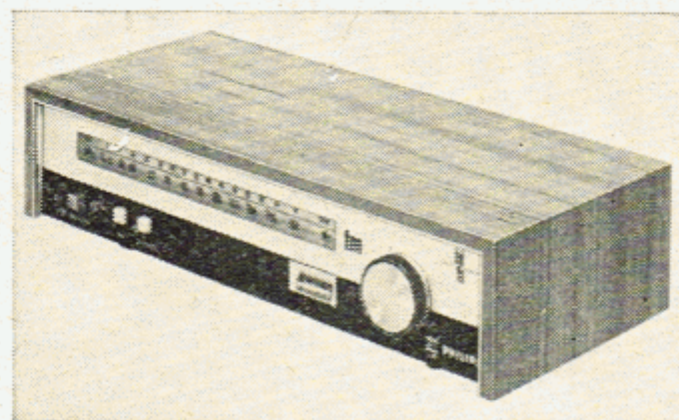
GA228 RECORD PLAYER is a fully automatic single record player. On pressing the start button, which is mounted at the centre of the 4-speed selector switch, the pickup performs a unique dance. First it rises from the arm rest, then it moves inwards slightly, lowers and travels inwards to 'seek' the edge of the record. Finally, having determined whether a 12, 10 or 7 inch record is to be played, it rises again, switches on the motor and lowers itself into the run-in groove. There is an auto-stop mechanism too, of course, which can be brought into play at any time by again pressing the control button.

The pickup arm is a simple, rectangular section, straight shaft with plastic finger lift and offset slide-on shell. The cartridge supplied is a crystal type with 18 micron (0.0007 in.) diamond stereo/mono LP turnover stylus (75 micron (0.003 in.) sapphire for 78's). The turntable disc is fairly light, with a rubber

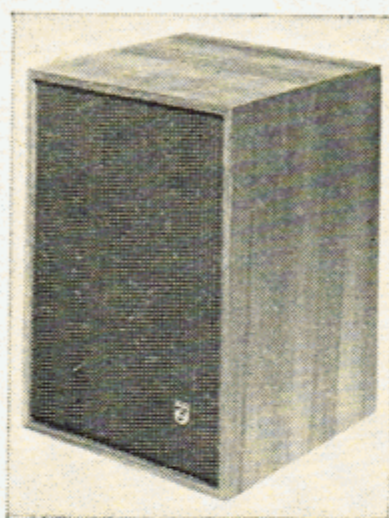
mat and measures 8 in. across. The plinth is teak veneered to match the other units and has a lift-off, clear plastic lid. Captive leads are fitted for mains and connection to amplifier (DIN 5-pin).



GH925 STEREO AMPLIFIER is rated at 6 Watts per channel music power (4 Watts per channel continuous) into 8 Ohms. It is extremely compact with a row of five knobs for source selection (gram, tape, radio), volume, bass, treble and balance plus push buttons for stereo/mono and on/off. DIN sockets are at the rear for gram, radio and tape (record and replay), and loudspeakers. An auxiliary socket provides a 9 Volt DC supply for operating any associated equipment—the lowest price Audio Plan tuner GH926, for example.



GH927 FM STEREO TUNER covers the range 87.5 to 108 Mc/s with an audio output of 200 mV. There is a conveniently large tuning knob and 8 inch long tuning dial. The moving coil tuning meter also serves as stereo indicator, an associated push-button causing the meter to deflect either on stereo signals only or on both stereo and mono. AFC and mains supply are also switched on or off by means of push-buttons. An aerial plug is supplied and a 5 ft. connecting lead with two DIN plugs for coupling the tuner to the amplifier.



GL559 LOUDSPEAKERS have a single 5 inch drive unit mounted in a 10½ by 7½ by 7½ in. vented box. They are rated at 8 Ohms, have 18½ ft. captive leads with DIN plug and are identical to those described in our review of the Philips EL3312 stereo cassette recorder (April 1967).

All the Audio Plan units were easily fitted on a shallow shelf and listening tests were conducted with the loudspeakers some 8 feet apart. The sound quality on stereo and mono records and radio broadcasts was very acceptable. Bass was not as extended as one gets from

large enclosures, but the frequency balance was judged to be nearly ideal: much better than having a booming bass—as happens in some radiogram cabinets. A clear indication of the designers' care in matching the units was that the mid-positions of the bass and treble controls was found to be right for the given loudspeakers, though subsequent measurement suggested that the amplifier 'flat' condition corresponded to a slightly higher bass setting. As least, this was true for the radio input though some reduction of both bass and treble seemed to be desirable for most gramophone records played on the GA228 turntable.

Radio sensitivity was adequate and most areas would require only an elementary room aerial for mono. Stereo reception is naturally more demanding and the incidence of background noise would normally make a loft or roof aerial necessary. The automatic set-down point for the gramophone pickup was found to be a few grooves into the record on the turntable tested. However, the error was the same on all sizes of record and a single adjustment of the internal pivot shaft, which was screw held, would be all that was required to put matters right.

An asynchronous motor is fitted and was found to be running about 1 per cent fast at all speeds—not enough to matter. Motor rumble was low, but could be detected close to the loudspeakers: other types of system noise were very low. The pickup playing weight was set at 4.1 gm.

Performance Tests

Measurements of frequency response showed the amplifier to be within its specification: tone control was slightly less than claimed, + 3 to - 12.5 dB at 150 Hz, and + 6.5 to - 10 dB at 10 kHz. The pickup response was slightly up at high and low frequencies, relative to the response at 1 kHz, which confirmed the preference during the listening tests for a small degree of bass and treble cut. The balance control reduced either channel to zero at full sweep. Input sensitivities and crosstalk were as specified and the claimed 4 Watts per channel sine wave output could be slightly exceeded before the onset of serious distortion.

In technical terms, therefore, these Philips Audio Plan units effectively meet their—sometimes modest—specifications. The units are well made, with internal wiring, etc., beautifully done. The cabinets are simple, with no frills, but are attractively designed in light teak with black and silver face panels. The musical quality is well balanced and speech too is reproduced pleasantly. At their price—the complete system reviewed here would cost just under £100—they can be strongly recommended. (Incidentally, substituting the GH926 mono FM tuner would produce a saving of £12 12s.) If these standards of design and workmanship are maintained up through the rest of the Audio Plan range—to the technically more sophisticated units—good value for money is offered over a wide spread of budgets from about £62, for the stereo gramophone here tested (without tuner), to well over £240.

JOHN BORWICK.

Wharfedale System 20. Price: see individual specifications below. Manufactured by Rank Wharfedale Ltd., Idle, Bradford, Yorks.

The complete range of System 20 equipment was submitted for review, fitted in a lowboy Selby cabinet with a pair of matching Dovedale loudspeakers. To facilitate the laboratory measurements, a separate amplifier and tuner were also supplied. JG therefore presents his findings on these two items first and JB follows with an evaluation of the loudspeakers and the Selby console.