

NEW 'POINT ONE'^{*} STEREO AMPLIFIERS

by **LEAK**

... the first name in High Fidelity since 1934



★ "POINT ONE" is the Trade Mark of H. J. Leak & Co. Ltd. It was originally applied to the first power amplifiers having a total distortion as low as point one of one per cent., when, in June, 1945, H. J. Leak, M.BRIT.I.R.E., revolutionised the performance standards for audio amplifiers by designing the original "POINT ONE" series.

Styled by **LONSDALE-HANDS** for enhanced appearance in your home. Designed by **HAROLD J. LEAK** to give you **OPTIMUM MUSICAL RESULTS** from:-

Records stereo and monaural
Tape stereo and monaural
Radio stereo and monaural
Microphone . . stereo and monaural

STEREO REPRODUCTION

The impact of listening to stereo reproduction on the great majority of listeners is profound. There is an astonishing sense of realism and an absence of listening fatigue. The overall impression is of greatly enhanced enjoyment, to such an extent that the majority of listeners declare loss of interest in normal single channel (monaural) reproduction.

Stereo is not new to communications engineers. The writer carried out his first stereo microphone transmission (with D. W. Turpin) in 1931, and the famous Philadelphia-Washington relay by Bell Telephone Laboratories in 1933 proved the feasibility of stereo sound as we recognise it today.

What is new about stereo is its availability to the general public by means of gramophone (phonograph) and tape records. There is no doubt that stereophonic radio will follow, possibly by Multiplex F.M. There is nothing experimental about stereo amplifiers to us; all the basic work was done many years ago, and the equipment described herein covers not only every present-day requirement but every foreseeable eventuality.

In this leaflet we describe stereo apparatus in a manner acceptable to the professional communications engineer and to the music-lover seeking the highest available standard of sound reproduction. The information contained herein is factual and as brief as its comprehensiveness allows.

'Point One Stereo' Pre-amplifier

FUNCTION

The function of an ordinary monaural pre-amplifier is to accept the tiny electrical signals from the input device (pickup, tape head, tuner unit or microphone) and to build them up distortionlessly to a magnitude suitable for passing on to a power amplifier.

The Leak "Point One Stereo" pre-amplifier is simply two identical monaural pre-amplifiers electronically separate, but physically combined.

The "Point One Stereo" pre-amplifier forms a complete stereo amplifying system when connected to a Leak power amplifier type "Stereo 20" or "Stereo 50" (see pages 5 to 8). The amplifying system is split into these two sections especially for your convenience: the pre-amplifier is decorative, small, light and easy to install and handle; it contains all controls, and enables you to place the heavier and bulkier power amplifier out of sight in any convenient location.

This pre-amplifier reproduces stereophonically and monaurally from records, tape, radio and microphone, using any pickup, any tape head, any tuner and any microphone available in the world. This comprehensiveness gives two important advantages. First, you can use the finest pickups and microphones available in the world: this is not the case with cheaper low-gain pre-amplifiers. Second, when reproducing from tape you can do so directly from the tape head, thus saving the cost of amplifiers built into the tape mechanism.

The "Point One Stereo" functions electronically to the highest standards obtainable by present techniques—to the performance standards demanded by communications engineers for broadcasting and recording*. This is proven by the engineering specifications given on pages 3 to 5.

There is nothing we can add to the circuitry or the price to improve the fidelity of reproduction obtainable from the "Point One Stereo". The features which make for ease and pleasure of handling are discussed on page 3.

APPEARANCE

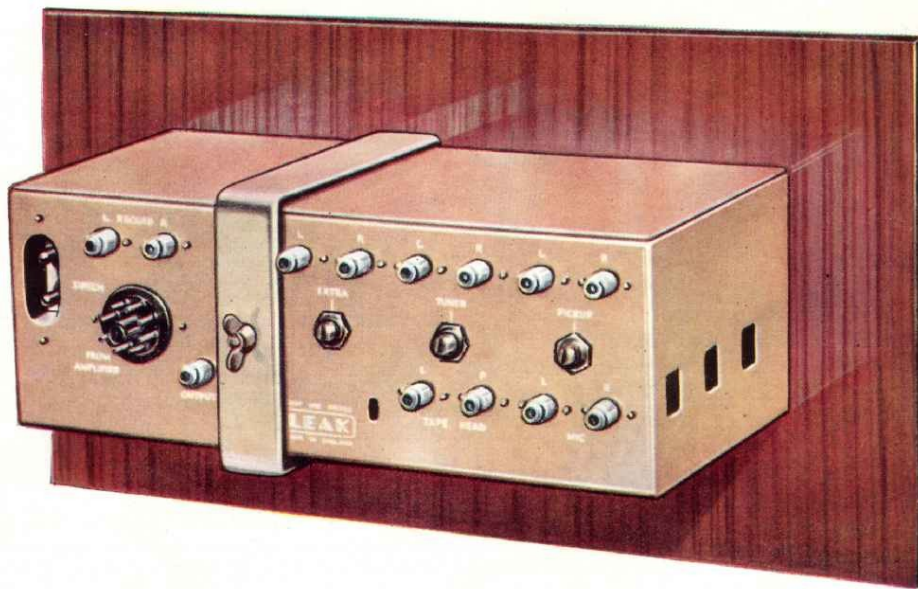
The "Point One Stereo" is styled by the world-famous designers, Richard Lonsdale-Hands Associates. The appearance is of restrained richness and dignity—"jewel-like" is the description by one user—whether the unit is used free-standing or whether it is cabinet mounted. The front panel will blend with *any* wood. These were major styling necessities.

The transparent front panel is engraved on the rear face in deep maroon, cream and gold, and the case is finished in light bronze.

* LEAK amplifiers are the choice of professional engineers such as the B.B.C. (over 500 delivered), the South African Broadcasting Corporation (600), ITV and many other Commonwealth and overseas broadcasting and TV systems, who use them for transmitting and/or monitoring (quality checking) the broadcasts to which you listen. Also, many of the gramophone records you buy are cut via LEAK amplifiers.

EASE OF OPERATION

A skilled electronic engineer has no advantage whatsoever over the layman in getting the best from the "Point One Stereo". Though comprehensive and flexible, it was created by the world's best-known amplifier designer specifically for the use and enjoyment of the music-lover at home, for his wife and for his children. Simple-to-follow operating instructions are enclosed with the pre-amplifier, and five minutes practice will give you easy mastery.



EASE OF INSTALLATION

Very great care has also been given to this consideration; we do not expect you to be a mechanic, electrician, wireman, solderer and cabinet-maker. The "Point One Stereo" can be connected to the Leak power amplifier in 30 seconds by means of the cables and plugs which we provide. There is a growing tendency to follow the practice in the U.S.A., where auxiliary equipment (turntables, pickups, radio tuners and tape decks) is supplied complete with cables and standard plugs which you simply plug into the appropriate sockets on the "Point One Stereo" and the Leak power amplifier. With such apparatus you can make all your connections for a complete equipment and have music within 10 minutes.

If the pre-amplifier is to be mounted in a cabinet we impress upon you that this takes less time and requires less skill than with any other pre-amplifier of which we have cognisance. An oblong cut-out is required, which takes about 10 minutes. The rough edges of the cut-out are hidden by the front panel, and the pre-amplifier is secured to the cabinet within 30 seconds by means of the U-shaped bracket and wing-nut which we supply (see illustration above).

In view of the care which we ourselves take, we consider it fair comment to point out that many pre-amplifiers are styled to look well on a dealer's shelf. Some of these require several hours expert cabinet finishing before they can be mounted, and, furthermore, it is sometimes obligatory to remove part of the decoration which contributed to the original attractiveness.

CIRCUITRY

The two identical circuits are designated "L" (for the left-hand input signal) and "R" (for the right-hand input signal). Each circuit consists of a low-noise, low-distortion 2-stage feedback tone control pre-amplifier. The first stage is used to give record and tape compensation by the use of frequency selective negative feedback. The second stage embodies feedback tone control circuits which give continuously variable control of both bass and treble frequencies.

All controls are of the single knob, dual-ganged, close-tolerance type, which give much greater ease of handling than the cheaper twin knob, dual-concentric, unganged type.

The pre-amplifier automatically draws its heater and anode supplies when plugged into a Leak power amplifier.

We have made provision for the "Point One Stereo" pre-amplifier to operate with any combination of two Leak monaural power amplifiers (TL/12, TL/10, TL/12 Plus, TL/25 Plus, TL/50 Plus) additionally to its more normal use with the "Stereo 20" or "Stereo 50". Further details of circuitry and facilities are given in the specifications which follow.

SPECIFICATION, FACILITIES and PERFORMANCE

The sensitivities shown below give full output from Leak power amplifiers, "Stereo 20" or "Stereo 50", with a signal of 1,000 c/s, with tone controls at "FLAT" and the volume control at maximum.

VALVES (Tubes): 4 — EF86 or Z729 or 6267 (International standard types of world-wide availability).

INPUT SELECTOR

A five position switch allows the choice of inputs from:—

PICKUP, monaural and stereo

Sensitivity, 3.5mV r.m.s.

Characteristic, RIAA, the world standard for stereo and monaural records.

Input impedance, 70,000 ohms approx.

TAPE HEAD, monaural and stereo

Sensitivity, 3mV r.m.s.

Characteristic, CCIR with treble control at "FLAT", bass control at "+2"; NARTB with treble control at "-2", bass control at "+3". With moderately priced heads, properly aligned, the playback response will be level within plus or minus 1db from 50-10,000 c/s when using EMI 7½ ins./sec. test tape SRT.13. This can usually be extended from 40-12,000 c/s by slight manipulation of the tone controls. The best heads, accurately aligned, will extend the response to 15,000 c/s.

Input impedance, 120,000 ohms approx.

TUNER, monaural and stereo

Sensitivity, 50mV r.m.s.

Characteristic, flat.

Input impedance, 70,000 ohms approx.

MICROPHONE, monaural and stereo

Sensitivity, 2mV r.m.s.

Characteristic, flat.

Input impedance, 120,000 ohms approx.

EXTRA, monaural and stereo

Sensitivity, 50mV r.m.s.

For (1) Any radio tuner,

(2) TV sound, or

(3) The output from equalised tape reproducers or the like.

Characteristic, flat.

Input impedance, 70,000 ohms approx.

FUNCTION CONTROL

A five position switch allows the choice of:—

- (1) Stereo.
- (2) Stereo reverse (i.e. one can change the left-hand side of the orchestra over to the right, and vice versa).
- (3) R (monaural, connects both channels to the "Right" input device).
- (4) L (monaural, connects both channels to the "Left" input device).
- (5) Monaural PU (this converts a stereo pickup so that it may play monaural L.P. records).

BASS CONTROL

Single knob, dual-ganged, close-tolerance, operative on both channels simultaneously. Continuously variable, plus or minus 14db at 50 c/s.

TREBLE CONTROL

Single knob, dual-ganged, close-tolerance, operative on both channels simultaneously. Continuously variable, plus or minus 14 db at 20,000 c/s.

VOLUME CONTROL WITH ON/OFF SWITCH

Single knob, dual-ganged, close-tolerance, operative on both channels simultaneously. The switch controls the power supply to the remotely placed Leak power amplifier.

BALANCE CONTROL

Single knob, dual-ganged, close-tolerance. Any degree of balance may be obtained, as either channel can be faded to zero output without affecting the other.

RUMBLE FILTER SWITCH

Turnover, 70 c/s; for use with the cheaper type of turntable.

PANEL LIGHT

This is fitted as a visual reminder that the power supply is on when the lamp is alight.

FACILITIES ON THE REAR PANEL

- (1) Outlets for Tape Recording: Situated on the rear, allowing for stereo or monaural recording from records, tape, radio, microphone and whatever device is connected to the "EXTRA" input.
- (2) Standard international type co-axial plugs and sockets are provided for all input connections.
- (3) Pre-set controls are provided for the adjustment of the level of the input signals from "PICKUP", "TUNER", and "EXTRA". These controls are single knob, dual-ganged, close-tolerance, operative on both channels simultaneously.
- (4) An octal male socket, marked "FROM AMPLIFIER" accepts the female plug termination of the 4 ft. cable which is supplied for connecting the pre-amplifier to the Leak power amplifier.
- (5) A 2-pin socket marked "SWITCH" accepts the plug and cable which connects to the Leak power amplifier to control its A.C. supply.
- (6) A special U-shaped bracket and wing-nut are provided for rapid and easy fixing of the "Point One Stereo" in a cabinet.

TOTAL HARMONIC DISTORTION

Less than 0.01% for 125mV output (which will load any Leak power amplifier). Less than 0.1% for 1.25V output (ten times the requirement for feeding a Leak power amplifier).

HUM AND NOISE

When plugged into a Leak power amplifier approximately 60db below full power output on "TUNER" and "EXTRA" positions, and approximately 52db below on other inputs, with tone controls at "FLAT" and volume at "MAX."

CROSS TALK

Between L & R channels, approx. -50db up to 1,000 c/s and approx. -30db at 10,000 c/s.

DIMENSIONS

Front panel, $11\frac{1}{2}'' \times 4\frac{7}{16}''$ (29.2 × 11.2 cms.).

Chassis, $10\frac{1}{2}'' \times 3\frac{1}{4}'' \times 5''$ deep (26.6 × 9.5 × 12.7 cms.).

This unit may be used free-standing (as on a table or bookcase), or it may be cabinet mounted on a panel of any thickness through a cut-out of $10\frac{1}{8}'' \times 3\frac{3}{8}''$ (27 × 9.85 cms.).

WEIGHT: 5½ lbs. (2.5 kgs.).

PRICE: 20 guineas. ϕ

INSTALLATION, OPERATION & MAINTENANCE

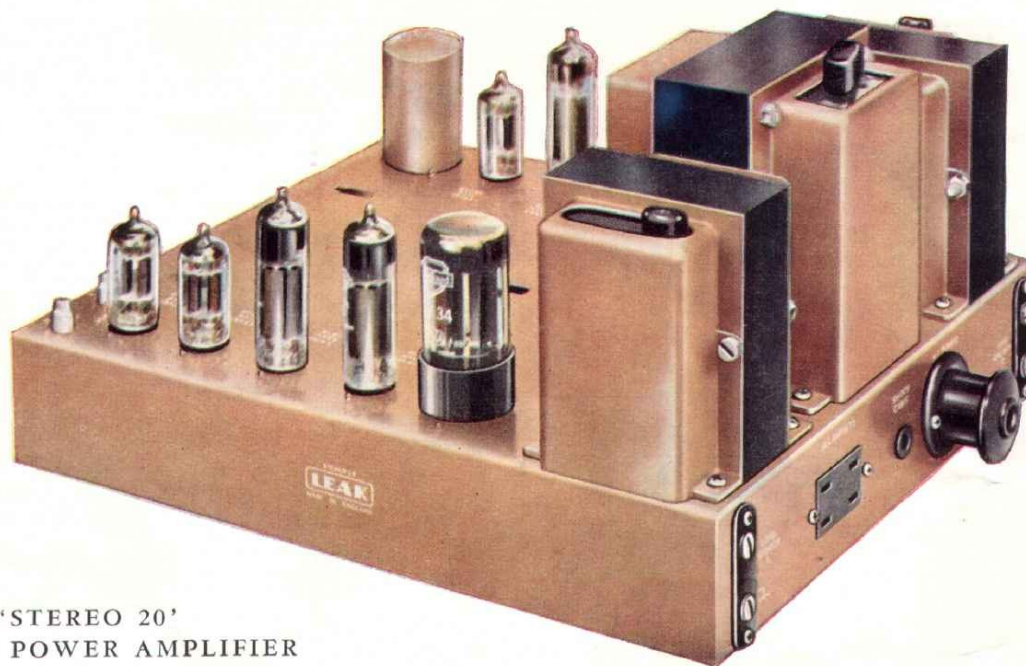
Each amplifier is accompanied by detailed instructions and circuit drawings. Installation and operation are simple, as explained in the text.

'Point One' Power Amplifiers 'Stereo 20' and 'Stereo 50'

INTRODUCTION

We were the first manufacturers in the world to design and market amplifiers with a distortion content as low as 0.1%, hence the adoption of "POINT ONE" as our trade mark. This was in 1945, and our first advertisement* stated, "these figures establish such radically new standards that they may occasion some surprise. We therefore wish to stress that no error appears in this announcement." Surprise and incredulity were duly expressed but communications establishments with laboratories equipped for accurate measurement placed large orders after making technical investigation. The length of the lead we established can be accurately placed from a survey of technical publications from 1945 onwards.

* Journal of the British Institution of Radio Engineers, September 1945.



'STEREO 20'
POWER AMPLIFIER

The 'Stereo 20' Power Amplifier

FUNCTION

The function of a power amplifier is to build up the relatively small signals accepted from a pre-amplifier to a magnitude capable of operating a loudspeaker system, and to achieve this with negligible distortions.

A stereo power amplifier, as built by Leak, is simply two identical power amplifiers electronically separate, but physically combined.

The "Stereo 20" power amplifier has a total power output of 20 watts, which is adequate not only for the largest room in a house but allows for the use of extension loudspeakers in other rooms.

EASE OF OPERATION

The only operation is to switch the amplifier on or off by means of the switch incorporated in the volume control of the "Point One Stereo" pre-amplifier.

EASE OF INSTALLATION

As explained above, you do not need operational access to the "Stereo 20", so it may be placed out of sight at the bottom of a cabinet, book-shelf or cupboard.

You can connect the "Stereo 20" to the "Point One Stereo" pre-amplifier in 30 seconds using the cables and plugs which we supply.

The twin leads from each of your loudspeakers connect to the "LOUDSPEAKER" terminals on the power amplifier marked unmistakably "L" (left) and "R" (right). This will take four or five minutes using only a screw-driver.

Finally, your two A.C. power supply leads and an earth (ground) lead are connected to a plug at the rear of the power amplifier in exactly the same manner as a domestic electrical appliance.

Four fixing feet are provided should you wish to secure the "Stereo 20" during transportation.

CRAFTSMANSHIP

"I can most certainly say at this stage that the workmanship and finish are of a quality which I have never before encountered in the radio industry, despite the fact that my association with the industry in one capacity or another extends back over 27 years. I think you are to be congratulated all the more on this achievement in view of the increasing tendency nowadays towards inferior workmanship and design."

Part of a letter from a purchaser of the "TL/12" amplifier who is a very well-known engineer and whose identity is known to the Editor of "Wireless World."

"For a number of years the Leak "TL/12" amplifier and pre-amplifier have had an enviable reputation for quality of construction as well as outstanding electrical performance."

"The quality of parts and workmanship throughout the "TL/10" is of a calibre not even approached by most American amplifiers, particularly at this price level. Terminal board construction is used throughout, with an overall effect which is gem-like."

"It is unmatched in quality of components and workmanship, and unexcelled in listening quality up to its maximum capabilities."

From "The Audio League" Report (U.S.A.) Vol. 2, No. 2, July 1956.

APPEARANCE and FINISH

The "Stereo 20" is finished in light bronze, stoved paint and all visible accessory fittings are in black. The general finishes are similar to the "TL/12" and "TL/10," which have operated for years in high-humidity, high-temperature locations such as Malaya and Hong Kong.

It is appropriate here to mention one of the basic principles of LEAK design. From long experience and by extreme attention to design details during development work on the pre-production models, we enable our craftsmen to achieve a high output per man-hour. The labour costs thus saved offset the increased costs incurred for high-grade materials, components and finishes, and this together with quantity production (made possible only by a world-wide market) explains how quality products may be sold at reasonable prices.

CIRCUITRY

The two identical circuits are essentially similar to previous Leak power amplifiers. Each comprises a 3-stage triple loop feedback amplifier, the main loop applying 26db of negative feedback over the complete amplifier from input to output terminals. A low-noise, high-gain triode feeds into a second-stage, double-triode phase-splitter, which in turn feeds two push-pull output valves (tubes) arranged in the distributed-load condition. Grain-orientated steel is used for the cores of the two output transformers and the mains transformer.

SPECIFICATION

VALVES (Tubes)

3 — ECC83 or B339 or 12AX7.

4 — EL84 or N709 or 6BQ5.

1 — GZ34 or 5AR4.

(International standard types of world-wide availability).

POWER OUTPUT

22 watts r.m.s. maximum (11 watts per channel).

44 watts peak (22 watts per channel).

TOTAL HARMONIC DISTORTION

0.1% for 10 watts r.m.s. output per channel (± 1 db) at 1,000 c/s.

HUM AND NOISE

80db, (± 3 db), below maximum output with a source impedance of 25,000 ohms.

SENSITIVITY

An input of 120mV gives maximum output.

FREQUENCY RESPONSE

± 0.5 db, 20 c/s to 20 kc/s.

DAMPING FACTOR

25, measured at 1,000 c/s.

INPUT IMPEDANCE

1 megohm, plus approximately 5 mmfd.

STABILITY MARGINS

Gain, 10db ± 3 db.

Phase, 20° ± 10 °.

LOUDSPEAKER IMPEDANCES

Loudspeakers of any impedance between 3 ohms and 20 ohms may be used. Adjustable plugs on top of each output transformer select three tapplings, nominally 16 ohms, 8 ohms and 4 ohms.

POWER SUPPLY

200 — 250V, 50 — 100 c/s.

or, (alternative model)

100 — 125V, 50 — 100 c/s.

A voltage selector plug is fitted on top of the mains transformer.

CONSUMPTION

105 watts (110 watts with Leak pre-amplifier).

SPARE SUPPLIES

A double socket marked "A.C. OUTLETS" is fitted as a convenient source of power supply for gramophone motors, etc. Corresponding plugs, with 6 ft. (2 metre) cables are supplied with the amplifier.

DIMENSIONS

10½" \times 12¼" \times 6¾" high (26.7 \times 31.1 \times 17.5 cms.).

WEIGHT

22 lbs. 6 ozs. (10.15 kgs.).

FIXING

Four brackets and screws are supplied for fixing the amplifier to a baseboard.

PRICE : 29 guineas.

The 'Stereo 50' Power Amplifier

The "Stereo 50" is effectively a larger and more powerful version of the "Stereo 20". The total power output of 50 watts is sufficient for theatres seating a thousand people or more. The power output is more than adequate in a house which is wired for the simultaneous use of loudspeakers in several rooms.

All details of Function, Ease of Operation, Ease of Installation, Craftsmanship, Appearance and Finish and Circuitry are similar to those listed previously for the "Stereo 20".

SPECIFICATION

VALVES (Tubes)

3 — ECC83 or B339 or 12AX7.

4 — EL34 or KT66 or 5881.

1 — GZ34 or 5AR4.

(International standard types of world-wide availability).

POWER OUTPUT

50 watts r.m.s. maximum (25 watts per channel).

100 watts peak (50 watts per channel).

TOTAL HARMONIC DISTORTION

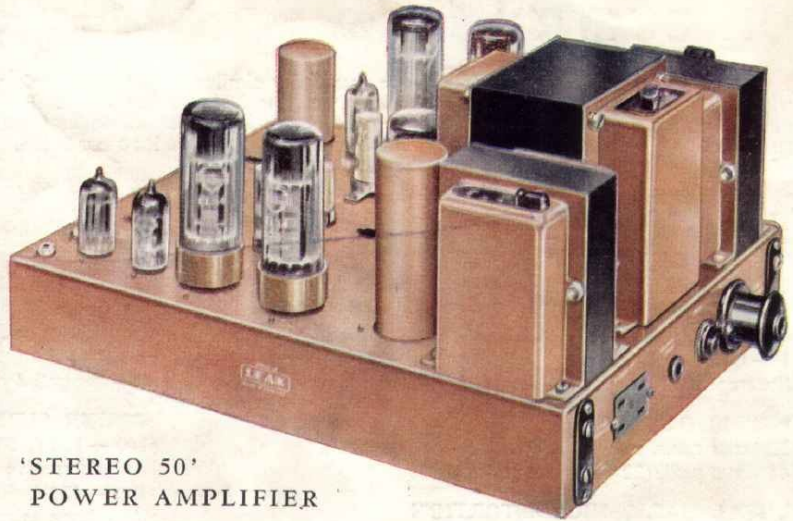
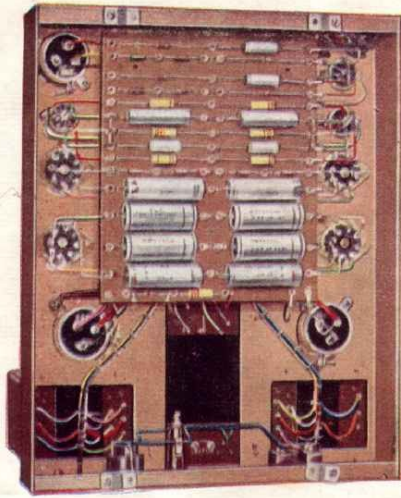
0.1% for 20 watts r.m.s. output per channel (± 1 db) at 1,000 c/s.

HUM AND NOISE

80db, (± 3 db), below maximum output with a source impedance of 25,000 ohms.

SENSITIVITY

An input of 120mV gives maximum output.



'STEREO 50'
POWER AMPLIFIER

FREQUENCY RESPONSE

± 0.5 db, 20 c/s to 20 kc/s.

DAMPING FACTOR

25, measured at 1,000 c/s.

INPUT IMPEDANCE

1 megohm, plus approximately 5 mmfd.

STABILITY MARGINS

Gain, 10db \pm 3db.

Phase, 20° \pm 10°.

LOUDSPEAKER IMPEDANCES

Loudspeakers of any impedances between 3 ohms and 20 ohms may be used. Adjustable plugs on top of each output transformer select three tapings, nominally 16 ohms, 8 ohms and 4 ohms.

CONSUMPTION

180 watts (185 watts with Leak pre-amplifier).

POWER SUPPLY

200 — 250V, 50 — 100 c/s.

or, (alternative model) 100 — 125V, 50 — 100 c/s.

A voltage selector plug is fitted on top of the mains transformer.

SPARE SUPPLIES

A double socket marked "A.C. OUTLETS" is fitted as a convenient source of power supply for gramophone motors, etc. Corresponding plugs with 6 ft. (2 metre) cables are supplied with the amplifier.

DIMENSIONS

10 $\frac{1}{2}$ " \times 13 $\frac{1}{2}$ " \times 6 $\frac{3}{4}$ " high (27 \times 33.3 \times 17.5 cms.).

WEIGHT

27 lbs. 6 ozs. (12.42 kgs.).

FIXING

Four brackets and screws are supplied for fixing the amplifier to a baseboard.

PRICE : 40 guineas.

TO ENGINEERS IN COMMUNICATIONS ESTABLISHMENTS

We have a very wide experience of modifying our amplifiers to suit special requirements. As examples, meter switching can be incorporated and a variety of panel mountings can be arranged. Please do not hesitate to let us know your physical requirements. Kindly note that modifications are undertaken only on minimum orders of 100 amplifiers of one type.

H. J. LEAK & CO. LTD. (Est. 1934), BRUNEL ROAD, WESTWAY FACTORY ESTATE, LONDON, W.3, ENGLAND
Telephone: Shepherds Bush 1173 (4 lines). Telegrams — Inland: Sinusoidal, Ealux, London. Foreign: Sinusoidal, London.