

1972

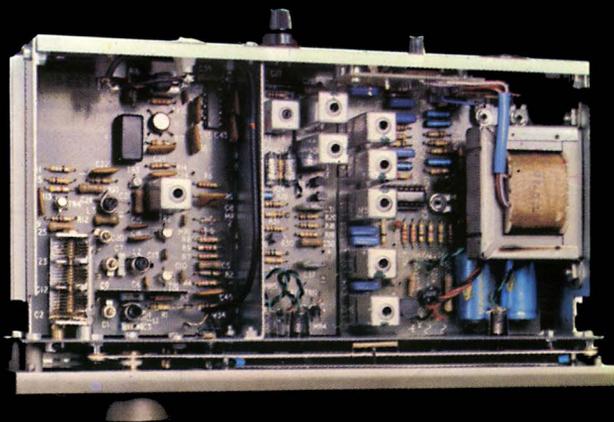
# HIFI YEAR BOOK

## 1972

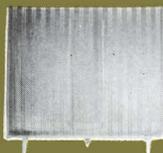
HIFI YEAR BOOK

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# HIFI YEAR BOOK 1972

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Technical Editor of Electrical & Radio Trading.

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## **MANUFACTURERS' REVISED PRICES**

*Due to purchase tax changes introduced in July and August 1971 an additional section giving manufacturers' revised prices is included in this edition.*

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# Introduction

The style of this latest edition of the *Hi-Fi Year Book* follows closely to the pattern established by its many successful predecessors.

As usual it starts with feature articles that cover a wide range of audio subjects and also provide a useful amount of long term reference material.

Then, making up the bulk of the book, are 22 directory sections giving specifications and prices of some 2200 products marketed under nearly 300 different brand names. Over 750 models are illustrated.

Directories of hi-fi retailers, manufacturers and brand names complete the editorial. Interspersed between the directory sections are numerous advertisements, many of which provide additional technical information about the products listed.

Although the general pattern of the book is the same as previous years there are a number of small but important changes that reflect the publisher's policy of continuous improvement.

Last year manufacturers' names were printed in bold capitals to make them easier to locate quickly in the directory sections. This year the process is taken a step farther by inserting a conspicuous black marker in front of each brand name.

In past editions it has been the practice to include an explanation of the less obvious abbreviations at the start of each section. But how does one decide which are less obvious and which are commonplace to an average reader? To overcome this difficulty a complete list of *all* abbreviations is given on page 46, right at the start of the directory sections.

Another important innovation is the inclusion of a complete alphabetical index giving names, addresses and telephone numbers of audio manufacturers and distributors. Included in this list are brand names and the name of the firm responsible for marketing in the UK.

An obvious change is seen in all the prices quoted. In addition to the usual updating of information that takes place every year, this time it has been necessary to change every price and purchase tax figure to decimal currency. All prices shown are recommended retail prices and where possible purchase tax is listed separately. In some cases it is included in the total and marked accordingly. Readers should note that by 'shopping around' it is often possible to obtain discounts of 10-20 per cent, or even more, on many audio products.

Our campaign to persuade, manufacturers to provide adequate information about their products, preferably in standard form, continues to meet with some success and this is reflected in the directory entries. However, it must be accepted that until there is a universally agreed standard for audio equipment in this country the performance figures quoted will often be based on widely differing parameters.

At the moment there is no easy solution to the problem, but it is to be hoped that the standards being drawn up between the Audio Specification Co-ordinating Committee (ASCC) and the British Standards Institution will provide an answer in the long term.

It must be stressed that the information printed in this book is that supplied by the particular manufacturer or distributor. The publishers do not in any way test or judge equipment.

The purpose of the book is to provide the maximum amount of up-to-date information about the widest range of audio equipment currently on the UK market. The somewhat vague guide-line used to determine whether a product is listed or not is 'domestic high fidelity', but in the absence of satisfactory standards it is inevitable that the contents of the book spill over into professional class equipment at one end and popular-priced unit audio systems at the other.

Readers looking for similar information about record players, radiograms, radios, car radios, low and medium-priced tape recorders, colour and black and white televisions and unit stereo systems are referred to our sister publication the *Radio and Television Year Book*.

Great care is taken in compiling and checking the specifications and prices printed in the book to ensure their accuracy, but the publishers regret they are unable to accept responsibility for any errors that may have occurred.

**Important notice.** Since the directory sections of this edition went to press there have been two changes in purchase tax that affect to some extent many of the prices shown. To overcome this difficulty a stop press section giving revised prices is included in this edition.

# Principles of the Dolby noise reduction systems

by Donald Aldous

In any audio recording or transmission chain inherent or intrusive noise has always presented problems to engineers and home listeners alike. Apart from improving the source, any techniques to reduce the effects of such noise (which may include hiss, hum, print-through and cross-talk) and any other undesired signals, can be broadly separated into two classes: (1) the non-complementary, in which the signal is post-processed only, thus producing an overall alteration of the signal whilst reducing noise, and (2) complementary, using both pre- and post-processing methods for the purpose of producing no overall changes, but reducing the noise in the chain.

Over the years every audio enthusiast has employed simple tone controls and filter systems to tackle this problem. In more sophisticated circuits the filter action may be made dynamic, as, say, in the *Dynaural System* of H. H. Scott (which varies the bandwidth of the amplifier by separate high-frequency and low-frequency controls automatically operated by the signal) or the multi-band diode expander system due to H. F. Olson, which works on the principle of the threshold effect.

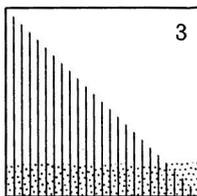
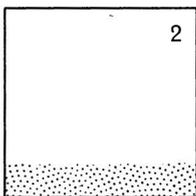
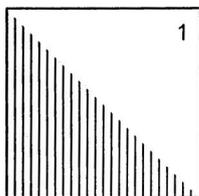
This noise bugbear has been attacked in many

ways, from the simple method of adopting suitable and optimum equalisation characteristics in record/playback, to various advanced types of compressors and expanders—the so-called companders.

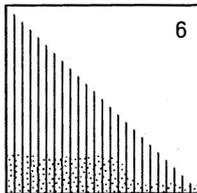
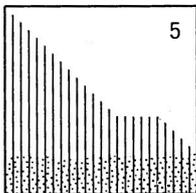
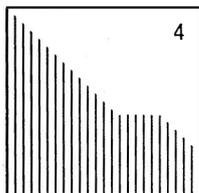
One such design, which had a vogue some years ago, was the *EMT NoiSex System*,\* but this—and many other devices using linear variable gain circuits controlled by the signal envelope or by pilot tones or electronically switched low-level/high-level circuits—have seemingly all capitulated to the revolutionary Dolby A system, launched about six years ago and presented by Dr Ray Dolby in his famous paper to the AES Convention on 25 April, 1967.

The first man in the British record industry to recognise the potential of the system was Arthur Haddy, Technical Director of the Decca Record Company (London), who installed the original A301 professional S/N Noise Stretchers in his studios here and at overseas affiliates.

Since that time the advantages of the remarkable Dolby 'black box' have been accepted by more than 300 record companies, recording studios and broadcast authorities in thirty-one countries. Professional broadcast applications of the Dolby units include use on landlines,



*Diagrams 1-3 illustrate the effect of noise (dotted areas) on programme material (vertical lines) when making and playing back an ordinary recording*



*Diagrams 4-6 show how the specially tailored response of the Dolby system eliminates or reduces noise when a tape is played back on suitable equipment (courtesy of Dolby Laboratories)*

\*NoiSex Recording System, by D. Aldous, *International Broadcast Engineer*, No. 10.510 (1965).

microwave links, VTR sound-tracks and, of course, high-quality sound recording.

In 1970 Dolby Laboratories (manufacturing HQ and laboratories in Clapham, London SW9) introduced their second generation of professional units, Models 360 and 361, which are smaller 1½in versions.

Briefly, Dolby's primary design aim is to provide the critical listener with a wider dynamic range, and his invention relies on the psycho-acoustic phenomenon that noise is masked (as heard by the ear) by loud passages in the programme material and becomes obtrusive only when the signal levels drop.

It operates as follows: a special signal component, derived from four band-splitting filters and low-level compressors, is combined with the incoming signal during recording or sending. On replay, the additional component is removed in a complementary manner (that is, the pre-determined boost of low-level signals is cut by

exactly the same amount), which process attenuates any noises acquired in the chain.

To put figures to this system, the total audio spectrum is divided into four bands as follows: (1) 80Hz low pass (hum and rumble); (2) 80Hz to 3kHz band-pass (broadband noise, print-through, crosstalk); (3) 3kHz high-pass (hiss and modulation noise); (4) 9kHz high-pass (as Band 3).

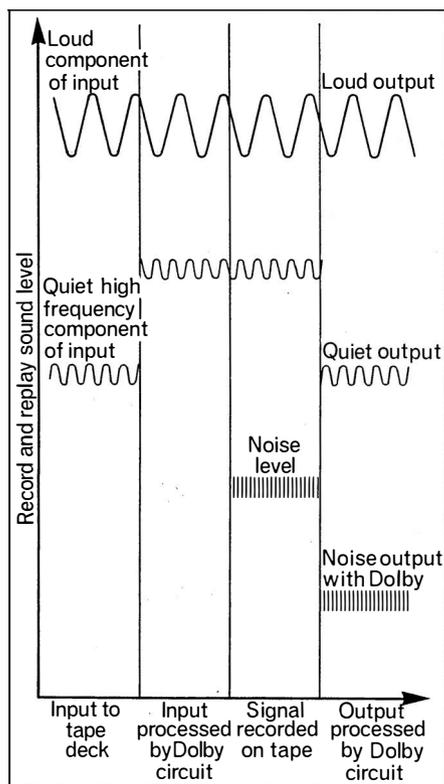
Bands 1, 3 and 4 are conventional 12dB per octave filters, while Band 2 has a frequency response complementary to that of Bands 1 and 3. The outputs of all the bands are combined with the main signal to produce a low-level output from the recording processor which is uniformly 10dB higher than the input signal up to about 5kHz, beyond which the boost in level rises smoothly to 15dB at 15kHz and then flattens out.

The distortions and snags of conventional compression/expansion methods, such as, 'pumping' or 'breathing' effects due to long recovery times of the circuits and the changes in level of background noise shifting with the control envelope, are avoided by the Dolby technique working on low-level signals. No measurable distortion is apparent or audible, although some observers claim that the action is just detectable by concentrated listening.

Tape hiss, the background noise added to the signal by a tape machine during recording—as we all unhappily know—tends to increase as tape speed is lowered and track width decreased. With this limitation in early tape cassettes and cartridges, and because some manufacturers of pre-recorded cassettes had a restricted repertoire of material mostly of mediocre quality, little serious attention was paid to the mechanical design of cassette machines not intended for or capable of high-quality sound.

The advent of the B-type Dolby system specifically engineered to fight this problem has provided designers with an incentive to increase the frequency and dynamic range, and to minimise wow and flutter figures, in tape transports.

The B-system works in exactly the same manner as the A-system by increasing the level of low-level signals during recording, and reducing their level again in a complementary way in playback. But it operates in one frequency band only, instead of the four employed in the Dolby A-professional system, thus simplifying the circuitry. (When built into a tape recorder only forty components per channel need be added.) This in turn cuts costs dramatically in contrast to the professional system.



Principle of the Dolby B system used in domestic recorders (courtesy of Bell & Howell)

The maximum effect of the B-circuit is 3dB at 600Hz, 6dB at 1200Hz, 9dB at 2400Hz and 10dB at 4000Hz and above. This lift/cut process assumes a low signal level, say, about 45dB below what can be called the Dolby level, that is, a level above which the signal is not compressed.

Incidentally, on cassettes, where standards are as yet undecided, this Dolby level is defined—like zero VU in sound level meters—as a flux level on the tape of 200nWb/m (200 nanowebers per metre in the International System of Units), which is equivalent to a standard line level for 0 VU, once the system is aligned. The importance of this information is to ensure the reciprocal relationship of input/output through the Dolby device to standard Dolby level.

The AC bias and signal currents of tape machines (open-reel or cassettes) are set up in the factory for optimum performance according to brand of tape. The three cassette formats currently marketed are C60, C90 and C120, produced by various manufacturers. High-frequency response, low-frequency overloading, even wow and flutter performance are effected by the type of base material and oxide coating on tape cassettes, and these differences must be taken into account in setting up a system for domestic use.

For the technically knowledgeable, Dolby cassette test tapes (recorded at 20mM/mm, or 200nWb/m in SI units) are available primarily to service engineers to facilitate alignment of the noise reduction circuitry.

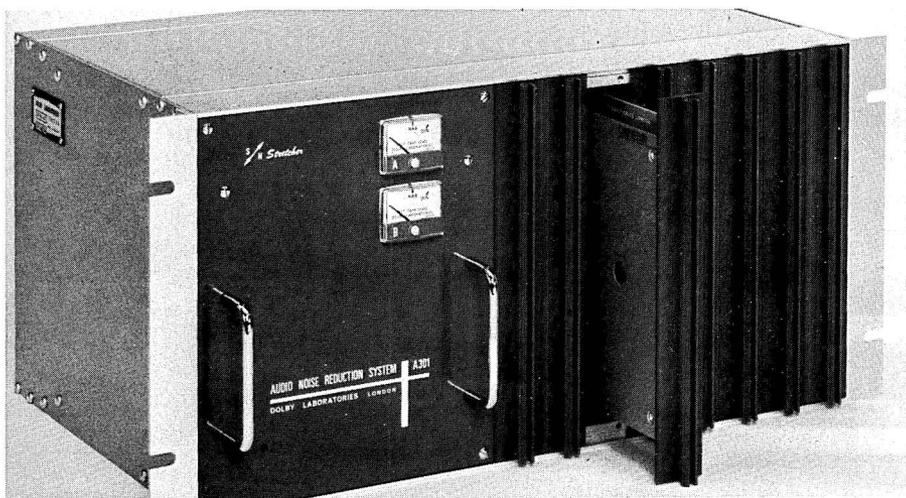
BASF 35LH (C90) tape cassettes have been

recommended by Dolby for some cassette models, licensed by their organisation, and the recent chromium-dioxide (CrO<sub>2</sub>) tapes (named Crolyn by the Du Pont company) appear to offer further improvements in S/N ratio and high-frequency response, extending to a 6dB improvement at 16kHz. They are, however, critical in relation to bias and signal currents and have inferior overload characteristics. Head wear has also been mentioned as a drawback, with the 1 micron gap heads now employed, but the new Akai type ferrite/glass heads may be an answer.

The major tape duplicating companies of the world appear to employ Gauss equipment, made in the USA, and Decca, at their Bridgnorth plant in this country, have incorporated the B-type system in processing their cassettes for general release. Other manufacturers (like Precision Tapes, for example) have followed this lead, offering the user enhanced dynamic range and reduced noise on a suitable replay unit.

The dynamic range is restricted to improve the S/N ratio when the record company is dubbing from 'unstretched' non-Dolby treated master tapes, representing a figure of only 20 to 30dB against up to 50dB on the best 1:1 speed/copied Dolby cassettes, although normally the copying speed is many times the original, up to a factor of 32.

The question of compatibility does arise with the present situation of marketing Dolby processed and non-treated cassettes or tapes. By this term is meant the playing, without the Dolby B compensation, of cassettes that have been so



*Dolby professional signal-to-noise stretcher type A301 with one compressor module partly withdrawn*

treated, or, conversely, using the special circuitry to replay untreated tapes.

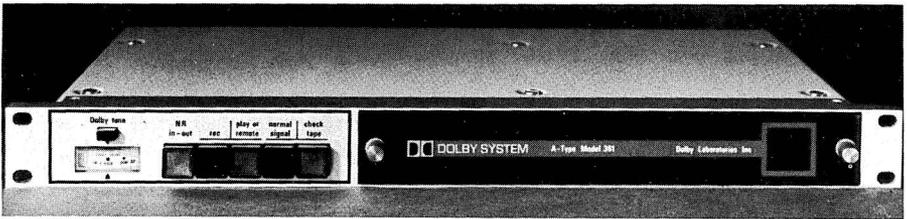
In theory, this is not possible to do correctly, and with wide dynamic contrast material, playing with ordinary tone controls will probably not prove satisfactory to the serious listener. However, with a variable high-frequency lift/cut hinged around 1kHz it will usually be found that boosting about 3 to 6dB at 5kHz for replaying untreated tapes/cassettes, and applying this amount of cut when reproducing a Dolby tape through a 'normal' amplifier will achieve the desired effect, although experiments may be necessary as machines and cassettes vary. It is always a compromise, of course.

On the American market several Dolby type cassette machines have been available for some time, albeit at high prices. For example, the Advent Corporation has issued several Dolby

systems, and there is a Dolby B type open-reel tape recorder offered under the KLH brand.

In England the Harman-Kardon CAD-5 is marketed through Highgate Acoustics and Stanley Kelly's designs (including the DCRI stereo cassette deck, the DTA50, with 25W per channel thick-film IC power amplifiers, and the KDB1 noise-reduction unit for using with open-reel tape machines) are released by Kellar Electronics. Another neat design is available from Rank-Wharfedale, the DC9 at £115. Bell & Howell also offers an attractive Dolby-B model, Design 1700, and one of the most consistent performance machines is another American deck, the Wollensak.

All the cassette decks so far mentioned are based on the mechanisms and electronics manufactured by Nakamichi Research Inc. of Japan, the pioneers in producing decks for private



*Smaller version of Dolby professional system suitable for rack mounting or stacking*



*Harman-Kardon CAD5 stereo cassette recorder incorporating the Dolby B system*

brand sale. This is an ingenious design, available with or without electronics in several forms, and represents a good performance/price ratio.

To obtain the optimum performance from cassettes demands some elegant and fairly costly mechanical engineering to manufacture a deck with the requisite very low wow and flutter figures necessary to satisfy highly critical audiophiles, many of whom still favour an expensive disc reproducing system. At the time of writing, no British companies have come out with tape decks for the Dolby system, but our indigenous manufacturers are investigating this area. Garrard (Plessey) certainly has such a tape cassette deck in the pipeline at this time.

In the early months of 1971, Dolby signed licensing agreements with several more major Japanese equipment manufacturers planning products incorporating the Dolby Noise Reduction System. These are big names additional to the existing Japanese licensees, Nakamichi Research and Hitachi, the latter now working on a series of Dolby equipped designs.

Several new products, released at the last Consumer Electronics' Show in Chicago in June 1971, included cassette decks, open-reel tape recorders and separate noise reduction units, as well as some early radio receivers (tuner-amplifiers) with Dolby circuitry built into them.

'Black box' adaptors (that is, separate noise-reduction units) that enable the benefits of noise reduction to be applied to any tape machine whose quality merits it, are now appearing here. One British model is the Alpha DB5 from High-gate Acoustics, which can be used between any

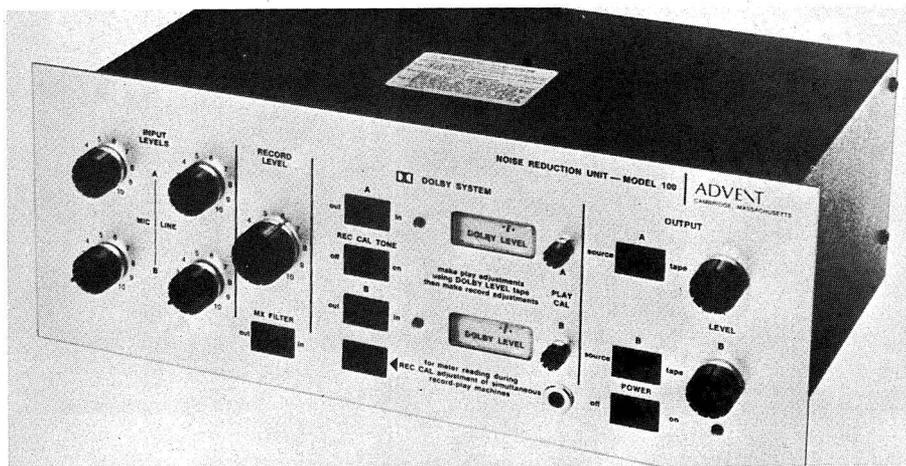
tape recorder and amplifier. Kellar Electronics KDB1 has already been mentioned.

Broadcast applications of the Dolby system have not as yet received the publicity that the technique has had in the gramophone record industry. But an increasing number of broadcast authorities (including the BBC) are beginning to recognise the possibilities for improving the S/N ratio in high-quality radio and TV transmissions by reducing landline or microwave link noises.

An inexpensive Dolby method of background noise reduction to improve FM reception was demonstrated in March 1971 to the National Association of FM Broadcasters in Chicago. This application of the B system to FM broadcasting corresponds to an improvement obtainable by an increase of transmitter power of five to twenty times, depending on the strength of the signal at the listener's location.

That FM transmissions are capable of high-quality sounds is apparent to anyone who has listened on a good receiver. Equally obvious is the fact of noise increase in the signal when the listener, even with a modest tuner, switches back and forth between stereo and mono modes of reception.

With the Zenith-GE pilot tone system (as adopted here and in America) the degradation is 21.5dB with 50µsec emphasis, and 23dB for 75µsec emphasis (American standard pre-emphasis), although the inherent noise in many tuners usually swamps this difference. The implication of these facts is evident: to achieve a S/N ratio comparable with monophonic transmissions, the stereo signal at the aerial input to



Advent Model 100 add-on noise reduction unit incorporates the Dolby system

the tuner/receiver must be some 20dB higher in stereo.

The problem in the USA is complicated by SCA (storecasting) background music services, which are economically necessary for the survival of many commercial FM stations. These have an additional channel of information or music on a second subcarrier based at 67kHz, and even high-grade tuners often emit high-frequency 'monkey-chatter' when SCA and stereo multiplex broadcasts are carried out simultaneously.

When the Dolby B system is employed during the broadcast, and listeners are equipped with the decoder unit, the result is approximately 10dB of noise reduction, which improvement can be taken as better S/N ratios, extended service area, reduced transmitter power requirements, simpler aerial arrays, or a combination of these advantages. No modifications are required at the transmitter except for the installation of a modest coding unit.



*Latest Bell & Howell cassette recorder has provision for switching Dolby correction system in or out of circuit*



*Wharfedale mono/stereo cassette recorder features Dolby B noise reduction system, piano key controls and twin VU recording level indicators*

During 1971 Dolby Laboratories and Decca (UK) made available to FM radio stations in America a series of A-type master tape recordings prepared by Decca during the past few years, including performances never before available to broadcasting companies in the A-form. When these stereo programmes are broadcast and received using the B-system, listeners receive a sound quality and noise-free background hitherto unobtainable, although the transmissions will not sound unusual to anyone who picks them up on an ordinary radio or FM tuner. The first FM tuners and receivers incorporating the Dolby B system are planned for widespread release late in 1971 in the USA.

A new noise eliminator circuit, developed by Richard S. Burwen, claims noise reduction of 50 to 60dB. The system, like the Dolby, is based on the principle of signal compression and expansion. (See AES Journal, February 1971).

Also just announced is a dynamic noise limiter circuit invented by Philips' Laboratories in Holland. No circuit details have been published but patents have been applied for.

Future developments may well include four-channel stereo sound on tape formats (that is, eight tracks in total) and cassette recorders with  $\frac{1}{4}$  in tape for domestic video recording, even in colour. With the state of the art advancing so rapidly, effective noise-reduction techniques will obviously play an ever-increasing part, with or without improved tape formulations and even finer micro-gap heads.

Dolby's expanding research department is examining all these applications, including methods of combating low-frequency noise and pressing faults and other limitations in disc records, all of which are now under active investigation.

# Hi-Fi from FM radio

by Gordon J. King

For hi-fi reproduction we require not only a high-quality amplifier and compatible speaker systems, but a signal source which itself is also of similar standard. It is, perhaps, a paradox that while our hi-fi amplifiers are carefully designed to deliver powerful signals and to prevent the self-generated distortion from rising much above one-millionth of the rated power output, we often have to be satisfied with programme signals carrying much more distortion than this.

## Distortion

Replay signals from a recorded source are obviously significantly higher in distortion than 'live' signals direct from a microphone, because of the distortion introduced in the various stages of processing. The distortion on the signal from a gramophone pickup, for example, can rise to 10 per cent or more, depending on the geometric accuracy of the cartridge/arm combination, the modulation level of the recording, the stylus tip dimension and the quality of the cartridge and the recording.

Even when everything is optimised the distortion is far higher than would be tolerated from a hi-fi amplifier. Speakers, too, are far from distortion-free, and non-linearity in these transducers adds more distortion to that of the programme signal. The amplifier is thus the 'cleanest' link in the chain, and with the ancillary distortions in mind, the astonishingly low distortion we expect from our amplifiers is sometimes questioned!

Professional tape recording and replay add less distortion than the disc equivalent, which would be expected, bearing in mind that disc records generate from tape anyway. But the distortion on tape from amateur equipment and efforts can be greater than that emanating from well recorded, professionally produced discs.

## Signal ratio and dynamic range

Distortion, however, is not the only factor in the hi-fi equation. There are two other very impor-

tant ones; namely signal-to-noise (S/N) ratio and dynamic range. These two tend to work together because dynamic range relates to the range of signal power from noise at the bottom to overload at the top. Thus, the smaller the noise on the signal relative to a given maximum power, the greater the dynamic range potential (Fig 1). The amount of maximum signal or power that is delivered or can be reproduced at a given low value (for hi-fi) of distortion also determines the dynamic range.

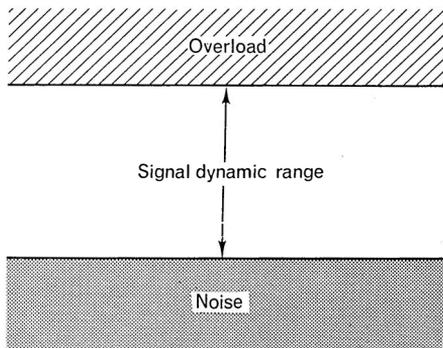
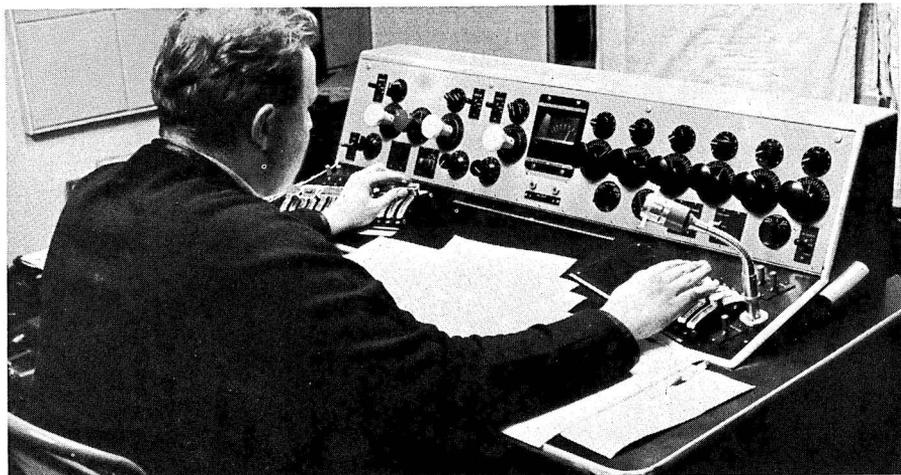


Figure 1 — Interpretation of signal dynamic range

Programme signal derived from recorded sources carries a significant amount of noise signal along with the distortion. On disc replay, for example, we receive the noise signal resulting from the action of the stylus in the groove of the spinning disc, while on tape replay noise is introduced from the nature of the oxide particles on the tape. Various, quite successful, artifices have been introduced over the years to combat the bane of all engineers, noise.

The disc recording characteristic provides for treble pre-emphasis, this allowing corresponding de-emphasis to be applied during replay which equalises the response while reducing the noise. This is feasible because most of the subjectively annoying noise occurs at the higher audio frequencies (where the signal power is small). Tape recording sometimes provides for



*BBC portable stereo control desk in use at the Playhouse, Manchester (BBC photograph)*

treble pre-emphasis and de-emphasis on replay not only to help with the noise problem but, sometimes, also to enhance the treble response, the de-emphasis then occurring naturally in the replay head and circuits. Moreover, improved tapes (chrome dioxide) are reducing the noise contribution, as also is the Dolby scheme for noise reduction, which is currently being engineered on a lower price scale than hitherto (see article in this edition of the *Hi-Fi Year Book*).

From the amplifier point of view it is no longer all that difficult or, indeed, costly to secure all the required power for adequate domestically-scaled dynamic range, with suitably low noise at the bottom end. Amplifier noise, of course, remains irrespective of the programme source, and the trouble is that all the various noise signals add (in quadrature) to produce one 'big' noise at the output.

The same applies to the distortion, which is why the amplifier should always be as free as possible from this bug, in spite of the speakers and programme signals adding the larger contribution.

However, as with distortion, the amplifier generally contributes the smallest proportion of noise to the sum, with the noise power at the speakers often being some three-million times below the rated power of the amplifier!

Highlighted, then, are the shortcomings of the speakers and the programme signals so far considered, relative to the hi-fi amplifier itself; but there is still another high-quality signal source which is available to all, namely FM radio.

Purely as a medium, the FM system of broadcasting is potentially lower in distortion than the two main recording mediums; and the dynamic range potential is also high. But since programme signals must be conveyed via the medium, these will suffer restrictions similar to those already described when the input is derived from a recording.

However, when the input is via a microphone system, in an acoustically balanced studio or concert hall, and accurately engineered audio links, then it can represent a programme signal source of the lowest distortion available to the hi-fi enthusiast.

In the audio channel, of course, there are various stages of low-level and high-level amplification, leading to the modulator of the transmitter. These produce distortion in the same way as our own amplifiers; but the broadcasting authorities endeavour to keep this to a minimum. Distortion and noises of various kinds can also occur on the audio links between the studio, concert hall, etc., and the transmitter. While it is agreed that such disturbances can be very distressing, there are times, notably when a super high-frequency (SHF) link is in use, when really high-quality signals arrive at our aerials. To exploit these to the full we must possess a good FM tuner.

#### **FM Hi-Fi**

Nowadays we look upon hi-fi only in terms of stereo. The single channel system of the past is no longer in mode and some enthusiasts regard

all mono sources retroactively. In this light, therefore, programme signal from the FM system can only be considered as truly hi-fi in those limited areas within range of a stereo transmitter. But I am not particularly in phase with this philosophy.

I think that good FM is well worth the expense and trouble of linking to the hi-fi, whether mono or stereo. Obviously, I prefer the latter (who wouldn't?) and, indeed, go to remarkable lengths to receive it in my part of the country which is still devoid of local stereo coverage.

### Tuner distortion

Total harmonic distortion (THD) produced by a good-quality FM tuner at maximum deviation (i.e. modulation level) is commonly less than 1 per cent, which is well below that of full modulation disc replay. Indeed, I have often measured THD as low as 0.3 per cent at 1 kHz in mono mode.

The distortion does tend to rise upwards from 1 kHz (as it does in some hi-fi amplifiers), but the rise is not great when proper attention has been paid to the design and alignment of the IF amplifier channel and FM detector. IF passband restriction does not necessarily attenuate the treble, as it does on the AM system, but, instead, it introduces harmonic distortion as the modulation level rises.

The reason for this is that while the AM system yields one pair of sidebands for each modulation frequency, the FM system yields a series of pairs of sidebands, separated from the carrier by one, two, three, etc., times the modulation frequency.

The sideband amplitude pattern is related to the modulation index, which is a function of the modulation frequency and the deviation frequency at any instant in time. FM IF passband must thus be significantly greater than that of the AM system to accommodate the multiple sideband pairs (see the second edition of 'FM Radio Servicing Handbook', recently published by *Newnes-Butterworth*, 88 Kingsway, London WC2).

However, little harm is done by suppression of the very small amplitude sidebands occurring at the end of a series, and it has been discovered that good quality reception is assured, even on stereo, when the IF passband is about 250 kHz between the 6 dB points (Fig 2).

### FM IF response

A smaller passband than this can aggravate THD

at high modulation treble frequencies, more on stereo than mono, while a larger passband is likely to result in adjacent channel interference effects, especially now that tuners are becoming more sensitive and more stations are being launched in Band II.

The curve in Fig 2 shows a response with very steep skirts, almost the textbook ideal. Such are desirable to keep interference effects to the very minimum, and recent tuners achieve them by

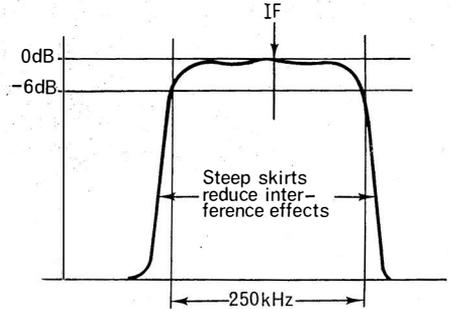
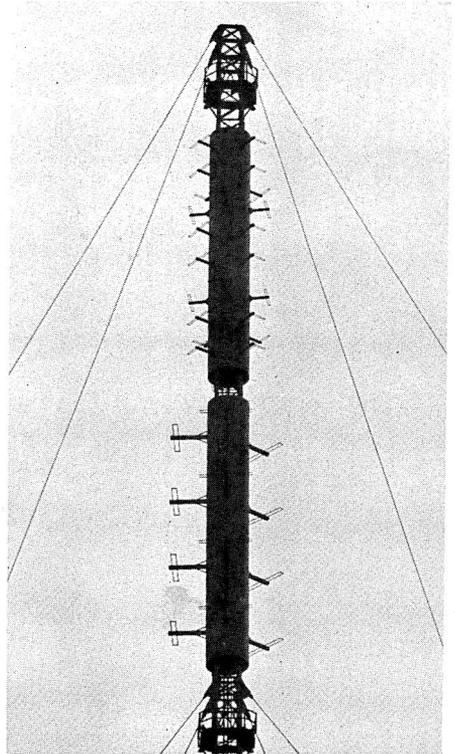


Figure 2—FM tuner IF response obtained by the use of ceramic or crystal filters



Upper section of FM radio aerial mast at Oxford

the use of ceramic or crystal filters to replace some of the bandpass transformers in the IF channel.

### Pre- and de-emphasis

Overall S/N ratio of the FM system is inherently high owing to the nature of the modulation and by the use of treble pre-emphasis at the transmitter and corresponding de-emphasis at the receiver.

As with disc records (or, indeed, any other medium), most noise is introduced at the higher

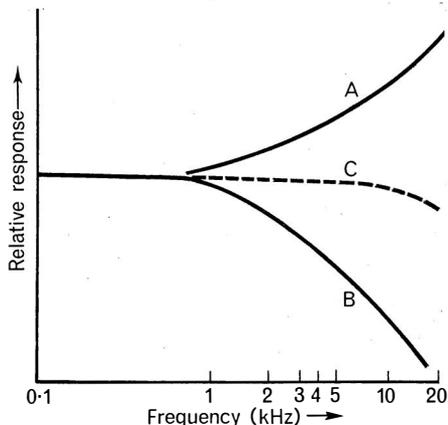


Figure 3—Pre-emphasis and de-emphasis response curves

audio frequencies, so by boosting these frequencies at source and attenuating them at the receiver the overall frequency response is unaffected, but noise is significantly reduced.

The curves in Fig 3 show at A the pre-emphasis characteristic, at B the de-emphasis characteristic and C the resulting overall response at the receiver. To secure the correct flat response, of course, the de-emphasis must match inversely the pre-emphasis.

Pre- and de-emphasis are expressed as a time-constant, relating merely to the functional time of an RC or RL circuit. The European pre- and de-emphasis time-constant is  $50\mu\text{S}$ , so tuners made in this country and in Europe destined for these markets would embody such a time-constant after the FM detector.

However, in American countries the time-constant is  $75\mu\text{S}$ . This means that FM transmitters there give more boost to the treble than we do in the UK and Europe. To get the right receiver response, therefore, the de-emphasis must correspond. If we run a tuner with  $75\mu\text{S}$  de-emphasis on the BBC transmissions the treble will lack 'brightness'; and some tuners with  $75\mu\text{S}$  de-emphasis are in fact finding their way to the UK market. It is possible to combat this to some extent by turning on a degree or so of treble boost at the amplifier, but this is really the wrong way of handling the equalising.

There is no simple way of checking the de-



BBC sound broadcasting transmitter hall at Sutton Coldfield station (BBC photograph)

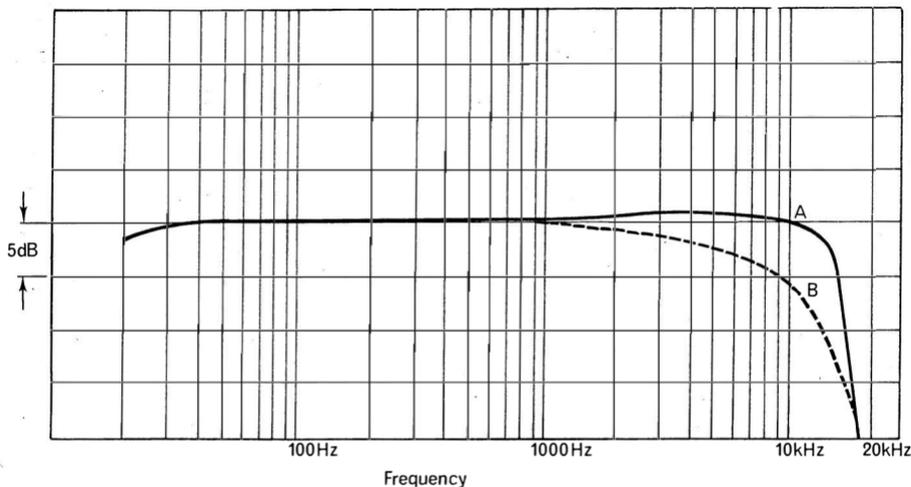


Figure 4—Frequency response curves for tuner with well-engineered de-emphasis at (A) and with incorrect high frequency response at (B). See text

emphasis of a tuner or receiver, since the requirement is for a costly FM generator whose modulation input can be adjusted over the audio spectrum via a suitable pre-emphasis time-constant. However, in my reviews of tuners and tuner-amplifiers (in *Hi-Fi News* and *Hi-Fi Sound*) I now make a habit of checking the overall de-emphasis from a suitably modulated VHF signal applied at the aerial socket; and the results are sometimes surprising!

#### FM frequency response

Modulation frequencies up to 15kHz can be handled by an FM system. On stereo the pilot carrier occurs at 19kHz, and to prevent this from getting into the audio circuits (subsequent to the stereo decoder), where it could cause interference troubles, a 19kHz filter is generally included in each audio channel. This results in swift roll-off just outside the audio passband.

Sometimes this filter is incorporated in the de-emphasis network, and when this is so accurate time-constant calculation is made difficult. If the filter design is poor, or if it is off tune, it can attenuate the treble within the audio passband. A second filter might also be incorporated in each channel to attenuate the 38kHz switching signal (i.e. subcarrier frequency) which is generated in the stereo decoder.

Curve A in Fig 4 shows the frequency response of a tuner in which a great deal of attention has been given both to the de-emphasis and the 19kHz pilot tone filtering. See how well the

response is maintained up to about 15kHz and then how quickly afterwards it drops into the 19kHz 'notch'.

Curve B shows the frequency response of a less carefully designed tuner which, in fact, could be carrying 75 $\mu$ S de-emphasis for the American FM system.

Some overseas manufacturers provide details in their service manuals for changing the de-emphasis according to the country to which the equipment is sold; but I am not convinced that all importers ensure that tuners and tuner-amplifiers handled by them in the UK are, in fact, equipped with the correct 50 $\mu$ S de-emphasis.

In the 1970 issue of the *Hi-Fi Year Book* colleague Roy Prince spoke on stereo radio and how it works, while in the same issue I surveyed the tuner state of the art at the time. It is not my intention here to repeat this information; but merely to say that tuner development has been along the lines discussed that year.

More tuners are being made with field effect transistors (FETs) in their front-ends; more are carrying integrated circuits (ICs) in their IF channels and more are being equipped with ceramic or crystal filters.

FM S/N ratio is generally related to the maximum deviation of the system ( $\pm 75$ kHz on the BBC system). On mono all this deviation is given to the single audio channel, while on stereo some of it is taken up by the pilot tone. The pilot tone, along with suppressed subcarrier residual, ac-

counts for about 10 per cent of the maximum deviation. The remaining 90 per cent of the modulation depth is divided equally between maximum mono/stereo information.

When a mono-only tuner (or a stereo one switched to mono) is receiving a stereo signal, therefore, the S/N ratio is potentially a shade below that possible from a mono signal (about 4dB impairment has been suggested).

However, when a stereo signal is being processed by a stereo tuner, the wider bandwidth coupled with the action of the stereo decoder impair the S/N ratio still further; but this is influenced by the strength of the aerial signal fed to the tuner.

All FM tuners exhibit an improving S/N ratio with increasing aerial signal up to a maximum determined by design. Curve A in Fig 5 gives some idea of this action. At 1 $\mu$ V input the S/N ratio (relative to maximum deviation) is around 15dB, increasing rapidly to a maximum of about 63dB at 30 $\mu$ V input. This is mono. The broken-line curve B shows the stereo impairment. At low signal inputs the difference is quite marked and can be as high as 15-20dB. But the margin narrows as the input signal rises, ending up almost equal (depending on tuner and decoder design) to that on mono.

Reception reasonably free from background noise requires a S/N ratio of about 45dB; a smaller ratio carries too much noise. For hi-fi, of course, the maximum possible ratio is required which, with good tuners, goes up to at least 60dB (note that a smaller ratio may be

quoted, but then the ratio is relative to a smaller deviation, sometimes around  $\pm 30$ kHz).

Going back to the curves in Fig 5, then, we see that for 45dB S/N ratio mono requires an input of about 10 $\mu$ V and stereo about 30 $\mu$ V. This clearly reveals the need for a higher aerial signal on stereo than mono for a given S/N ratio. FM aerial installations are therefore particularly important in poor reception areas where the signal is relatively weak to start with. When the aerial signal is strong the difference between mono and stereo can be insignificant, as, for example, at 200 $\mu$ V relative to curves A and B in Fig 5.

### FM limiting

Another FM parameter from the hi-fi aspect is limiting. This is shown by curve C in Fig 5, where 0dB corresponds to the maximum output of the tuner at (in this case)  $\pm 75$ kHz deviation and 1kHz (sometimes at 400Hz). The function here is a gradual rise in audio output with increasing aerial signal until the output reaches 0dB, where it then remains constant in spite of further increases in signal strength. In Fig 5, maximum limiting occurs at about 70 $\mu$ V. Some high-quality tuners reach the maximum limiting point at a smaller input, some around 10 $\mu$ V or less.

Limiting occurs in the IF channel, and tuners and receivers with several IC stages can exhibit astonishingly low limiting voltages.

### Capture ratio

For hi-fi reproduction the aerial signal strength

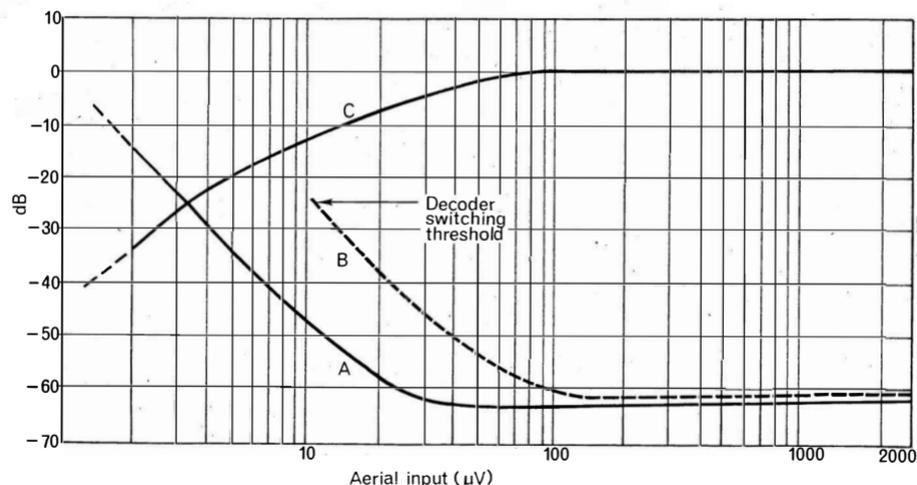


Figure 5—Curves showing mono and stereo S/N ratios and limiting characteristic of FM tuner

should always be sufficient to push the tuner or receiver well into limiting and the design should be such that the limiting remains fairly high even at frequencies a small distance (within the IF passband) either side of the correct tuning frequency. Good limiting means that the FM system attribute, namely, the *capture ratio*, is optimised. Capture ratio is the ability of an FM tuner to reject the weaker of two stations operating in the same channel, in almost complete favour of the stronger station. The AM system has no such equivalent.

Design of the FM detector also influences the capture ratio, and top-class tuners boast a capture ratio as low as 1.5dB. This implies that the interference resulting from a co-channel station a mere 10 per cent weaker than the wanted station will fall 30dB below the maximum output (based on a deviation of  $\pm 75\text{kHz}$ ) of the tuner; or, in other words, the power of the unwanted station as received will be 1000 times below that of the wanted station, modulation depths being equal. There are other interpretations of the capture ratio, however.

The capture ratio attribute also contributes to the deletion of adjacent-channel interference; but how well this happens depends on the IF channel and FM detector response characteristics, these factors also themselves directly contributing to the suppression of such interference, particularly when the IF channel is equipped with ceramic or crystal filters to give the textbook response shown in Fig 2.

We have seen, then, that the FM S/N ratio can be almost as high as the hi-fi amplifier itself; but this, of course, discounts the S/N ratio of the audio signal—mono or stereo—carried by the medium.

As the S/N ratio is impaired on stereo relative to mono, so also is the THD increased. As already mentioned, a good-quality FM tuner in mono mode might produce only 0.3 per cent THD at full deviation. On stereo, however, this could go up to 0.5 per cent or towards 1 per cent, but it is still below the distortion on most other programme sources.

### FM dynamic range

Since the modulation can be taken right up to  $\pm 75\text{kHz}$  and is not limited to a maximum of 100 percent in the same way as the AM system; and since a hi-fi value of S/N ratio is also attainable, it follows that the FM system has an intrinsically high dynamic range potential. But just how well this is (or can be) exploited de-

pends on the nature of the programme material, on the studio equipment and audio links and on the views of the transmitting authority.

It has been suggested that the FM dynamic range is deliberately limited to a value below that attainable from gramophone records; but I cannot personally agree with that when dynamic range is interpreted as the dB difference between ambient noise and maximum peaks. Indeed, I have measured peaks in excess of 50dB from ambience during a large-scale work transmitted from Wrotham (from the Royal Albert Hall).

Nominal dynamic range of the BBC on FM is 22dB, but indicated on a reference to a time scale. This means, generally, that the peak programme meter must not remain below 22dB below maximum modulation for more than half a minute.

However, during that time the maximum peaks could be as low as 42dB below maximum modulation, based on the material being audible at a reasonable listening level. Thus, if there is a period of silence the ambience could fall to some 60dB below peak modulation, since no attempt is made by the engineers to bring up the level during such a period.

During the transmission of some large-scale works the modulation may be allowed to fall below the '22dB below maximum modulation' datum for a period greater than half a minute. At the other end of the scale a maximum level of 2dB below the maximum modulation ( $\pm 75\text{kHz}$ ) is established; accidental peaks above that level automatically operate limiters at the transmitter.

It is thus seen that relative to ambient noise and within the time scale mentioned peaks almost to 60dB can occur on the FM system. Indeed, during the transmission of some works, such as a Mozart symphony, there is no compression whatever; and it would be unusual for compression of more than about 10dB to occur during any one movement or section of a larger work. On the AM system, though, automatic compression is used at the transmitters to restrict the effective dynamic range.

Make no mistake about it, there is a lot to be said for FM radio as a hi-fi programme signal source.

# Demonstration discs

## A review of some of the year's outstanding records

by W. A. Chislett

Most owners of hi-fi equipment derive great pleasure from discovering and playing records of outstanding quality. But for a record to attain the high standard necessary to come into this category a number of factors have to be considered.

First, of course, there is the music itself. And, naturally enough, people's tastes in music vary enormously. Then there are people to whom the performance is the prime factor, while for others the realism of the sound for its own sake makes the greatest appeal.

There are many superb sounding records of performances which, for one reason or another, are no more than mediocre. And there are splendid performances marred by some fault or deficiency in the recording.

In this article I have tried to cover most fields of music and to recommend only records which, in my opinion, gain high marks on both counts. All are stereo recordings and all have been released since the 1971 edition of the *Hi-Fi Year Book* was published.

### Decca SET469-70

Georg Solti's first record as conductor of the Chicago Symphony Orchestra is a stunner. In Mahler's *Symphony No. 6 in A minor* he realises to the full the joy followed by gentle resignation of the slow movement and the utter ferocity of the finale; and for the first time on records we get the full impact of the three hammer blows in the last movement.

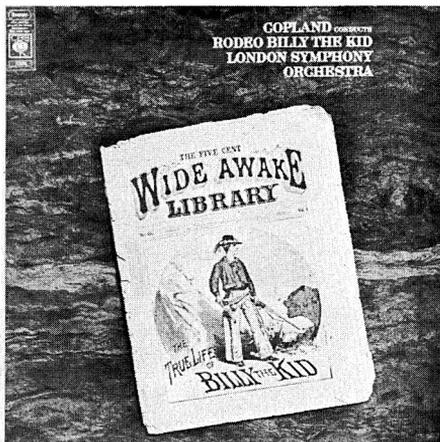
### CBS 72888

There is any amount of scope for brilliance in Aaron Copland's ballet suite *Billy the Kid and Rodeo—Four Dance Episodes* but it is rather for the intimate expressiveness of the strings which the composer coaxes from the London Symphony Orchestra that this record is specially recommended, particularly in the Nocturne from *Rodeo*, and there is also some quite heavenly clarinet playing at the beginning of this move-

ment. Surely the player can only be Gervase de Peyer.

### Philips 6500 048

Bernard Haitink's playing with the Concertgebouw Orchestra of Richard Strauss's *Heldenleben* provides one of the happiest surprises for a long time. As a conductor of Strauss his is by no means one of the first names that would come to most minds. His outstanding success is largely because he presents music which is often over-emotionalised in performance with complete integrity. He avoids any suspicion of pomposity and there is no striving for effect. Thus he gives both dignity and nobility to a work in which so many conductors seem unable to resist trying to gild the lily. Under such treatment it emerges as the great composition which it really is but rarely sounds. The playing as such is superb and the recording is both clean cut and rich. The only flaw is a tendency to balance the violin solos, which Hermann Krebbers plays so beautifully, a little forwardly.



CBS 72888—Expressive strings and clarinet

### Decca SXL6482 :

There have been few records in which unusually large orchestral forces have been captured so faithfully as in that of the Saint-Saëns *Symphony No. 3* played by the Los Angeles Symphony Orchestra conducted by Zubin Mehta. In addition to triple woodwind an organ and two pianos are required. I have long thought that it is only the big forces required, and consequent expense of performance, that have kept this symphony out of the regular concert repertory. The music is brimful of zest and vitality and the scoring is masterly. The sound here throughout is notable both for its clarity and its opulence, and the finale, in which the organ comes fully into its own, is tremendously exciting.

### RCA VIC51301

Probably the most extrovert conductor of the century is Leopold Stokowski, about whose age there is something of a mystery but who must be as near ninety as eighty, if not nearer. Moreover for half a century he has always been in the forefront of conductors prepared to experiment with the techniques and processes of recording. His recording of this group of popular Wagnerian excerpts with the Symphony of the Air was first released in 1962, but no-one would guess it from this reissue in refurbished and cheap form. Not only are the brilliant brass and mellow woodwind first class but the rich sonority of the strings is a joy to hear. Specially recommended tracks are *The Ride of the Valkyries* and the *Tannhäuser Overture and Venusberg Music*.

### H.M.V. ASD2647

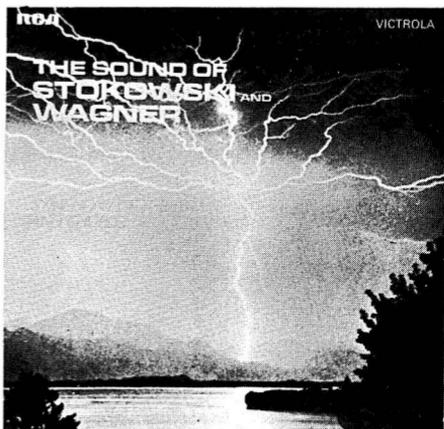
George Malcolm and Simon Preston are perfectly matched soloists in Bach's *Double Harpsichord Concertos in C major and C minor* respectively, and Yehudi Menuhin and his Festival Orchestra make ideal partners for them. The slow movements are the personification of poetical insight and the quicker ones are gloriously exhilarating. Some may think that a little greater stereo separation of the two solo instruments might have been an advantage, but I mention this with bated breath. Any change in this might so easily have given a gimmicky and exaggerated impression of positioning, and this would have been disastrous in such music. It is one of those happy records in which all, including recording engineers, seem to be at their best.

### Philips 6500 099

Surely one of the most precocious compositions



Decca SXL6482—Zest and vitality

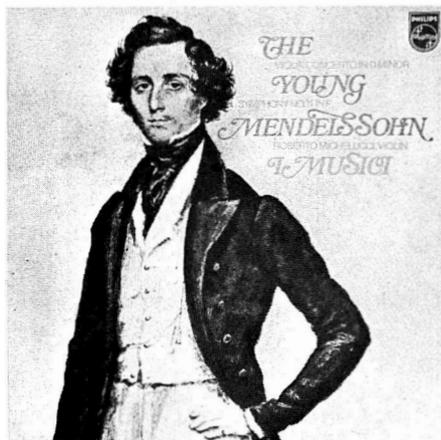


RCA VIC51301—Brilliant brass, mellow woodwind



HMV ASD2647—Perfectly matched soloists

of all time is the eleventh of the twelve *Symphonies for Strings* which Mendelssohn wrote as a boy. It reveals a maturity and depth of feeling as well as an assurance in writing which is almost incredible in a boy of fourteen. Possibly it rises to its greatest heights in the *Allegro* finale but it is never happier than in the scherzo, which is based on a Swiss wedding dance and in which there is a delicious touch when the composer assumes the Turkish style made fashionable by Mozart and Beethoven by adding timpani, triangle and cymbals to the strings. I Musici play it to perfection, as they do also the even earlier, and lighter-weight *Violin Concerto in D minor*, with one of their members, Roberto Michelucci, as a fluent soloist who gives just the right touch of romanticism to the music.



Philips 6500 099—Played to perfection



CBS 72841—Crisp and clear solo piano

### Decca SXL6495

In recent years Willy Boskovsky and the Johann Strauss family have become almost synonymous. The most recent 'New Year's Concert', in which Boskovsky directs the Vienna Philharmonic Orchestra, is shared between the three brothers, Johann, Josef and Eduard, and is perhaps most desirable musically for the rarely heard polkas by the two younger brothers. Be this as it may, good humour overflows in music and playing alike and the recording is beautifully natural sounding. Is there, I wonder, any other orchestra with such a sensitively flexible team of basses?

### Columbia TW0313

Gyorgy Cziffra and the Orchestre de Paris conducted by his son combine in a performance of Liszt's *Hungarian Fantasia* for piano and orchestra which is positively dazzling in its abandon and virtuosity, and which soundwise achieves a rare balance between solo instrument and orchestra and an internal balance within the orchestra that is even rarer. With it are coupled Franck's *Symphonic Variations* and the Grieg *Piano Concerto*, both of which would respond better to more persuasiveness and less bombast.

### CBS 72841

For solo piano it would be difficult to find anything more desirable in its field than Schumann's *Kreisleriana* as played by Horowitz. It is a performance which combines passion with the utmost delicacy and tends towards the forceful rather than the meditative, a perfectly legitimate approach. The recording is crisp and clear. Perhaps I ought to add that for those who prefer a more meditative reading there is a fine performance by Rubinstein (RCA SB6840) but he is not quite as well served by the recording engineers.

### RCA SB6844

There are quite a lot of guitar records which fulfil all our exacting requirements except that close recording often allows too many of the squeaks and other extraneous noises without which it seems impossible to play the instrument to obtrude. This new one by Julian Bream contains a minimum of these unwanted sounds. The major item is Mr. Bream's own arrangement of a *Sonata in A* which Paganini wrote for violin and guitar, giving the latter the lion's share of the fun. It is superbly played and recorded, as are the lighter-weight and shorter pieces which accompany it and of which perhaps the Mendel-

ssohn *Canzonetta* and the Schubert *Menuetto* are the most attractive.

#### **Decca PFS4204**

As the sub-title 'Marilyn Horne sings Carmen' suggests these excerpts are primarily designed to present Miss Horne in the title role, one to which her voice is ideally suited. Her three major solos, the Habanera, the Seguidilla and the Gypsy Song, are all absolute winners. There is very good singing by others and the Royal Philharmonic plays very well indeed for Henry Lewis, but Miss Horne is the heroine, as she is intended to be, and she is perhaps best of all in the Seguidilla, which is a model of crisp delicacy. A word of warning however. The volume level is high and this should be allowed for in the control setting.

#### **Decca SET456**

Marilyn Horne also joins Joan Sutherland in operatic duets taken from the complete recordings of Bellini's *Norma* and Rossini's *Semiramide*. There are two extended scenes from each opera and in all four the partnership between these two great artists, each at the top of her form, is a joy for connoisseur and neophyte alike. If a sampler from so uniformly desirable a disc is needed let it be the 'Mira, O Norma' scene from Act 2 of *Norma*. If there be today two other singers capable of negotiating Bellini's long, flowing lines so magnificently I have never heard them.

#### **H.M.V. ASD2601**

For a male singer I leave opera and turn to Nicolai Gedda, partnered at the piano by an equally sensitive artist, Jan Eyron, in a group of love songs by Beethoven, a choice which is all the more acceptable by its unexpectedness. Here is a rare combination of lovely tone and supreme refinement, from beginning to end; listen, for instance, to the rhythmic security in *Mit einem gemalten Bande*, the perfect legato in *Adelaide* and chuckling skittishness in *Der Kuss*, to mention outstanding qualities in but three of the songs.

#### **Columbia TW0320**

Called 'A Grand Operetta Gala', this is in the nature of a sampler record culled from a number of outstanding recordings released in recent years. Again Nicolai Gedda is in top form and among the other soloists are Grace Bumbry, Anneliese Rothenberger, Rita Streich and Her-

mann Prey. A generous selection ranges over the whole of the comparatively short years when Viennese operetta reigned supreme, from Suppé and Johann Strauss, with whom it started, through Lehar, Millöcker and others, to Robert Stolz, its last genuine exponent. Especially recommended are duets from *The Merry Widow* and *The Gypsy Baron* and Rita Streich's song from *The Zarewitsch* among the better known numbers, and a most insinuating song from Stolz's *Venus in Silk* among those which are less familiar.

#### **Decca PFS4191**

Coming now to light music which is equally suitable for background music and for more careful listening there is 'The Beatles Song Book'. The songs of Lennon and McCartney may not seem very promising material for Frank Chacksfield and his Orchestra but Johnny Keating has come up with superlatively good arrangements, some sweet and soft and others brilliant and brassy. The playing could not be better, and the recording is almost uncannily realistic.

#### **Decca PFS4199**

'Latin Splendour' is another record which reveals Decca's Phase 4 Stereo recording at its best. Werner Muller and his Orchestra are best known by a massive and lush string section. Here Herr Muller has assembled what sounds to be a huge brass section to breathe new life into a dozen of the most popular of all Latin-American numbers. It is all tremendously exciting.

#### **H.M.V. CSD3678**

The Royal Air Force Band has a lightness of touch and flexibility of rhythm which often eludes even the best of military bands. This is admirably exemplified in 'Marching with the Royal Air Force', a selection of old and more recent marches. Particularly effective, both in performance and recording, are Alford's *Old Panama*, Hall's *Officer of the Day*, an old favourite well worthy of revival, and *Wien, Bleibt Wien*, one of those marches which everyone knows but to which few can put a name. It is by Johann Schrammel (1850-1893), who founded the type of small orchestra (usually two violins, accordion and guitar) which bears his name and which is still immensely popular in Vienna.

# Meaning and importance of pickup parameters

by John Earl

The spate of pickup cartridges currently imported into the UK, from oriental sources in particular, is tending to confuse the price-versus-quality issue. Enthusiasts and audiophiles therefore seek a rational explanation of the seeming paradox of cartridges costing sometimes less than £5 boasting specifications equal to, if not better than, those of acclaimed quality costing up to eight times as much.

To get to the bottom of this situation we shall have to see what constitutes a 'real hi-fi' cartridge and study the important parameters involved. But at the outset I would like to stress that pickup cartridges cannot be judged or compared by listening tests alone. Such subjective tests are certainly important, but as a concluding arbiter rather than an initial one.

During the past twelve months I have had at least 100 cartridges through my laboratory, not only for review, but also for other purposes, and I have developed a 'parameter awareness'. Indeed, after running through a series of searching tests and studying the results I get a fair idea of what a particular cartridge is going to sound like when playing a known record and feeding into my standardised audio system.

It certainly does not follow automatically that an expensive cartridge is going to make better sounds than a less expensive one. In fact, I recall one controlled subjective test involving a number of experienced listeners who voted 100 per cent in favour of a cartridge costing round the £6 mark while the one being compared was in the £25 bracket.

What the listening panel didn't know was that the £6 cartridge was tracking at almost 3 grams, while optimum tracking performance of the £25 model was a mere 1.5 grams. They were told afterwards, of course!

## Balanced design

A pickup has to do two things: firstly, play records with the least mechanical wear and secondly, translate the modulation detail as

accurately as possible. These two things are not necessarily compatible. Generally, however, particularly in the hi-fi realm, a good low force tracker also exhibits good electrical characteristics (i.e. frequency response, transient response and separation) and vice versa.

A hi-fi cartridge is endowed with a delicate mechanical/electrical balance; this is the design craft. Too much towards the mechanical side may save records but at the expense of sound quality, while too much towards the electrical side may yield good sound quality but at the expense of records.

Each side, too, must itself be in balance. But let us look first at the mechanical side. The requirement is for the stylus tip to remain in intimate communication with the groove modulation over the entire music complex with the least downward pressure (tracking force).

This is easier said than done, for not only are significant physical properties evoked, but the vibrating tip also has to operate the 'dynamo' of the cartridge to produce the signal voltages.

## Signals

A music signal is highly complex and appears nothing at all like a simple sinewave on the screen of an oscilloscope (Figs 1 and 2). Nevertheless, the pulses making up the music signal can be resolved to a multiplicity of harmonically related sinewaves of different amplitudes and phase relationships, depending on the nature of the music at any instant in time. It is not cheating too much, therefore, to base pickup tests on pure sinewave modulation. In any case, a music signal is far too random and of varying nature to make it suitable for fundamental tests.

A sinewave has three main parameters which are frequency, amplitude and wavelength (Fig 3). Wavelength is the length of the wave over time  $t$ , while amplitude is the distance between the datum line and one of the peaks (peak-to-peak amplitude, of course, being the distance between the positive and negative peaks). Frequency is

the number of times the complete wave occurs each second, and is given in Hertz (Hz).

Now, let us suppose that we have a stereo test record carrying sinewave modulation of 1kHz in the lefthand channel. The groove wall nearer to the record centre thus undulates smoothly in correspondence to the sinewave and, assuming no distortion, the wave patterns will match fairly closely. Incidentally, the groove wall nearer to the record periphery carries the modulation destined for the righthand channel.

Assuming a perfect system, the sinewave modulation will cause the stylus tip to oscillate correspondingly with time, while the 'dynamo' part of the cartridge will deliver a signal reflecting that originally recorded (i.e. pure sinewave). In practice, of course, demon distortion plays its unkind part, but that is another story.

### Disc modulation

Overall amplitude of stylus oscillation will match the p-p amplitude of the modulation, greater deflections occurring with rising amplitude, while oscillation rate is geared to the frequency. 1kHz means that 1000 p-p deflections occur each second. At 10kHz there are 10,000 p-p excursions each second, and for good tracking the stylus tip has to remain in faithful contact with the groove undulations at these high oscillation rates—up to 20kHz for hi-fi.

This is no mean task, as one can appreciate. Moreover, at each waveform peak the stylus tip comes to a halt and then changes direction. Clearly, maximum stylus velocity occurs between the two peaks of the waveform. This is called transverse velocity which, obviously, must be a function of both amplitude and frequency.

Peak transverse velocity is, in fact, equal to  $2\pi fA$ , where  $f$  is the frequency in Hz and  $A$  the peak amplitude. RMS transverse velocity is given by  $1.41\pi fA$ .

Velocity is expressed as so many centimetres per second (cm/S). At 1kHz and a peak amplitude of  $10^{-3}$ cm the peak transverse velocity is thus 6.3cm/S (taking  $2\pi$  as 6.3).

Rearrangement of the expression gives peak amplitude as  $V/2\pi f$ , where  $V$  is the peak transverse velocity. Thus we can see that at a constant amplitude the velocity increases proportionally with frequency, while at a constant velocity the amplitude is inversely proportional to the frequency.

### Recording characteristic

Pure constant amplitude implies that the velo-

city increases with frequency at the rate of 6dB per octave, while pure constant velocity implies that the amplitude increases with *fall in frequency* at the rate of 6dB/octave.

Gramophone records are recorded at constant velocity over a small part of the middle of the spectrum (around 1kHz) and at approximately constant amplitude at reducing frequency, limited to a maximum of about  $5 \times 10^{-3}$ cm to avoid groove collapse.

Frequencies above the constant velocity middle part of the spectrum are progressively lifted in level so that on replay they can be correspondingly cut (by the equalisation) along with the record surface noise, this obviously yielding enhanced signal-to-noise performance.

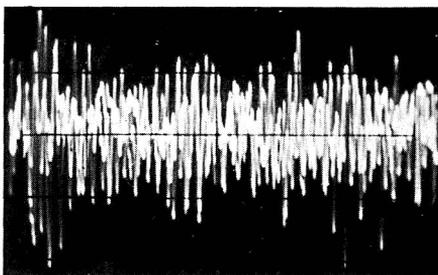


Figure 1—Music waveform displayed on the screen of an oscilloscope

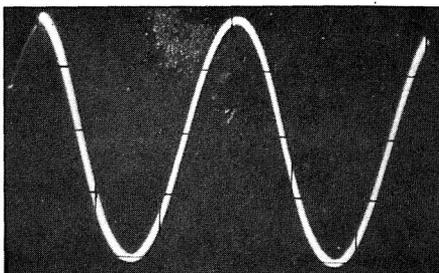


Figure 2—Oscilloscope trace of a pure sine wave

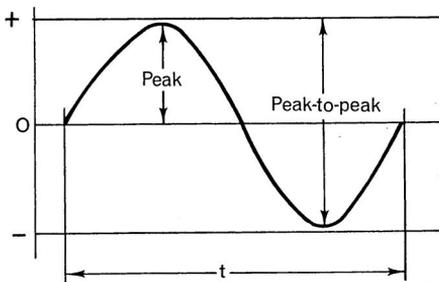


Figure 3—Basic characteristics of a sine wave (see text)

The net result is that the recording characteristic approximates a slope of 4dB/octave over the spectrum (Fig 4), it thus being approximately constant amplitude in terms of velocity.

It is not possible to be definite with regard to the maximum velocity recorded at any part of the spectrum. This, of course, depends on the nature of the music. However, there is a mechanical limit, which is in two parts. That imposed by the mechanics of recording and that imposed by the mechanics of replay.

It is not my intention in this article to explore the recording side of the operation; but soon we should have some idea of the replay limitations. Nevertheless, it is noteworthy that peak velocities up to at least 25cm/S have been measured on some heavily modulated discs of high dynamic range. But we must always remember the complex nature of music signals, the transient peaks of which can rise in excess of those of a pure sinewave.

#### Acceleration

Anyway, we must again return to the simple sinewave to consider another important parameter, namely that of acceleration. We have seen that the stylus tip under the direction of the groove modulation halts at each peak and changes direction. We thus get a change in velocity, which is acceleration (Fig 5).

Based on a sinewave the modulus of acceleration is  $2\pi fV$ , but to get the acceleration (or g) value this has to be related to gravitational acceleration. This brings in the force unit *dyne*,

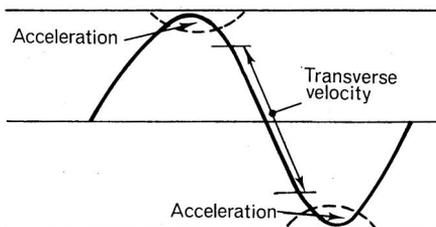


Figure 5—Sinewave groove modulation showing velocity and acceleration zones

corresponding to 1/980-62 gram at latitude 45 deg and sea level. In most non-critical calculations, however, the dyne is generally regarded as 1/1000 gram.

We can now get some idea of the accelerations involved in record replay. For example, at 10kHz and 10cm/S the g is about 630 times in excess of the pull of gravity! If the modulation goes as high as 20cm/S at 10kHz, then the g is 1260! Acceleration is thus proportional to both frequency and velocity.

The stylus tip obviously has mass (pity this!). Not only is it composed of its own inherent mass, but it also takes in that reflected from the cantilever and 'dynamo' couplings, etc. The total mass referred to the tip is called *equivalent* or *effective* mass, and it is this which is under the control of the physical parameters expounded. In other words, the equivalent tip mass is subjected to the high velocities and accelerations noted.

Relative to time, the larger a mass, the greater

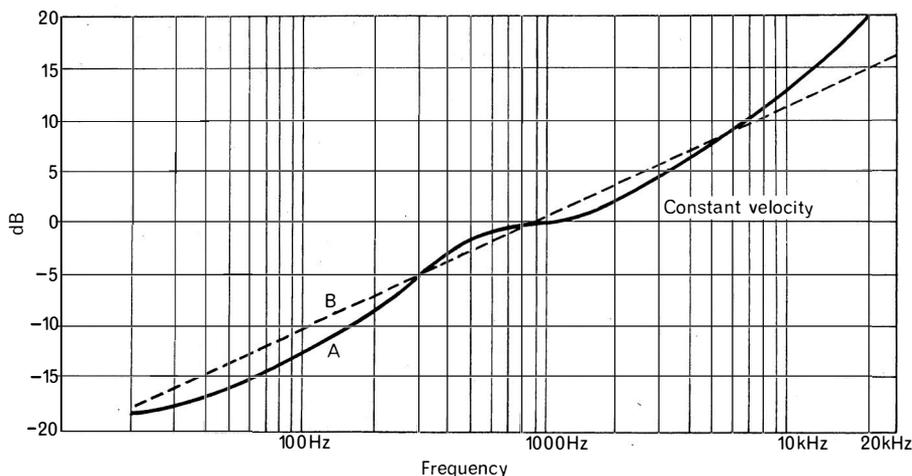


Figure 4—RIAA recording characteristic showing slope of approximately 4dB/octave over the spectrum

the force required to get it in motion and the greater the braking force required to halt the motion. This is the *moment of inertia*, another physical property. However, remember that the velocities and accelerations are instigated by the groove modulation, which means that the forces resulting from the accelerating mass (i.e. the liberation of kinetic energy) are felt by the groove walls.

Faithful tracking means that there can be no discontinuity of stylus/groove modulation contact, so the forces which are encouraging the equivalent mass to fly out of the groove have to be at least equalised. This is where the tracking force comes in. The tracking force must thus balance the reactive forces of the equivalent tip mass operating in the groove in order to achieve faithful tip/modulation contact.

### Tracking force

It is noteworthy that in spite of a stereo disc carrying left and right channels on its two walls, there is always an upwards component of reactive force, even when the tip is directed to oscillate laterally. This is because the walls are set at an angle of 45deg.

From first principles, the force tending to discharge the tip from the groove is the product of the equivalent tip mass  $M$  and the acceleration  $g$  ( $F = Mg$ ). Rearrangement yields  $M = F/g$ . Modulus of acceleration  $g$ , we have noted, is  $2\pi fV$ , so based on 10kHz 10cm/S modulation we can see that the effective tip mass can be no greater than 1/630 gram when it is required accurately to track at 1 gram.

On the face of it, it would appear that an effective tip mass greater than the 1.5 milligrams just mentioned could be accommodated merely by turning on the tracking force. This is true to some extent; but to avoid undue record wear, especially when the tip is down to 12.7 $\mu$ m (0.0005in) radius, or when it is elliptical (or biradial) with radii of, say,  $7.6 \times 17.8\mu$ m (0.0003 · 0.0007in), the tracking force must be as small as possible. The smaller the effective radius, the greater the contact pressure applied to the groove modulation for a given tracking force.

### Record damage

Moreover, the mechanics of the cartridge might be such that even by turning on the tracking force by a significant amount the high-frequency tracking performance may fail to show any improvement. Indeed, the downward pressure at the point of contact could well delete subtle

high-frequency and high velocity modulation so that the cartridge itself never 'sees' it anyway.

A small tip radius tracking at much more than 2 grams would soon wipe off the modulation corresponding to high amplitude transient detail that it is incapable of handling, probably leading an untutored user incorrectly to conclude that his cartridge is tracking well and that the lack of detail is due to a poor recording.

Most record damage results from a large effective tip mass, and to keep the mass down to a hi-fi low a great amount of detailed work goes into the design and manufacture of the cartridge.

It is also important that resonances be controlled, for violent resonance of the effective tip mass is another cause of record damage at the treble end. All these factors cost money, which is why we find cartridges costing up to £100.

### Compliance

So far we have looked only at the tracking at the high-frequency end of the spectrum. Low-frequency tracking is equally important, of course, but down at this end of the scale the effective tip mass is less critical, owing to the smaller accelerations. What is wanted here is freedom of stylus movement, called compliance, the reciprocal of stiffness.

We have seen that maximum peak amplitude is about  $5 \times 10^{-3}$ cm. Now, since compliance refers to the distance of stylus deflection in cm divided by the force in dynes, expressed 10<sup>-6</sup>cm/dyne, we can easily calculate the compliance value required to handle maximum peak modulation at the low-frequency end of the spectrum for a given tracking force. This is where the mechanical balance, mentioned earlier, comes in, for there is little point in making a cartridge with a wide tracking margin at low frequencies if the tracking is severely limited at high frequencies owing to excessive effective tip mass. Moreover, from the tracking point of view there can be no future in increasing the compliance significantly above that required for tracking the maximum amplitude recorded (unless, of course, the aim is to over-rate the merit of compliance in the eyes of the purchaser). A more important parameter is effective tip mass, which is rarely specified.

Compliance is thus  $A/F$ , where  $A$  is the amplitude of stylus deflection and  $F$  the force. Using this, then, and basing the force on 1000 dynes (approximately equivalent to 1gram) which, incidentally, is tracking force, we find that to accommodate an amplitude of  $5 \times$

$10^{-3}$ cm at a force of 1 gram we need a compliance of only  $5 \times 10^{-6}$  (i.e.  $5 \times 10^{-3}$ A/1  $\times 10^3$ dyne). This is the theoretical minimum.

In practice, other forces have to be masked, such as those related to the pickup arm, etc. Thus the minimum compliance value is generally greater than this with hi-fi cartridges, sometimes greater than  $30 \times 10^{-6}$ cm/dyne.

### LF resonance

There is another aspect of cartridge compliance which is not directly related to low-frequency tracking performance. This is the low-frequency resonance of the pickup system as a whole, taking into account the effective mass of the arm at the stylus tip.

Resonant frequency  $f_0$  is equal to  $1/2\pi\sqrt{MC}$ , where M is the effective mass of the arm reflected to the stylus tip and C the compliance of the cartridge. Clearly, then, the greater the mass and/or the compliance, the lower the  $f_0$ . At resonance the pickup system tends to behave as a high-pass filter, so for maintenance of the bass response the  $f_0$  must not be too high.

However, if too low it can encourage low-frequency mistracking and motor rumble disturbance. For example, the slip frequency of some gram motors occurs at a shade above 20Hz, so if the resonance occurs around that frequency motor rumble can be aggravated, while if it is below about 10Hz it might correspond to disc ripple (warp) frequency and result in unstable tracking.

Too low a frequency can also result in mistracking due to local mechanical disturbances, such as floor vibration and vibration of the motor board mountings, etc. Resonance a little higher up the response could correspond to other resonances in the system, such as speaker resonance or even room resonance. And this can encourage acoustic feedback from the speakers back to the pickup, via the motor board, arm, turntable and disc.

From the LF resonance aspect, therefore, a knowledge of the cartridge compliance can be useful, especially if the effective mass of the arm is known (this, incidentally, is not the same as the static mass, and must take into account the mass of the cartridge and headshell combination at the end of the arm).

It will be appreciated that a cartridge will have two values of compliance, one vertical and the other lateral (relating to the freedom of movement of the stylus in those planes), so it is possible to get two LF resonances. The arm,

too, can have more than one mode of vibration and mass reflection at the tip.

Compliance is generally given in static terms, it then being measured in a shadowgraph in respect of centimetres deflection per dyne of unit force. Dynamic compliance is measured differently, being based on a test record at low-frequency (about 100Hz) of known amplitude. The value is then calculated by adjusting the tracking force to the mistracking threshold, but since this mode of measurement must include other factors, such as mechanical resistance and mass, it is really a measure of mechanical impedance at the particular low frequency at which the measurement is made. Compliance measured statically is generally greater than when measured dynamically for the reason just mentioned.

Compliance must never be so high that it causes the 'dynamo' system to 'bottom' or short out magnetically, and the compliance should remain fairly stable up to the maximum tracking force specified.

Mechanical linearity is also important, for distortion can arise if the output varies for different tracking forces. There must be sufficient inherent balancing force to restore equilibrium of the stylus assembly when the tracking force is removed.

Compliance by itself would result in a 'springy' stylus system, so another ingredient is added, called mechanical resistance, this providing the electro/mechanical damping of the stylus assembly and tending to quell in-band resonances.

### Tracking performance

Mechanical balance of design, therefore, relates to consistent tracking over the entire music spectrum at a given tracking force, when account is taken of the increasing velocities and hence accelerations from bass to treble resulting from the nature of the recording characteristic.

The most meaningful parameter is thus the 'trackability' of the cartridge. This expresses the maximum velocities over the spectrum that can be handled at a given tracking force, the design in this respect suiting the recording characteristic; the bass end mostly influenced by compliance and the treble end by effective tip mass, with the damping added to smooth both the mechanical and electrical aspects.

In other words, the 'trackability' is a measure of the dynamic impedance at the tip, the smaller the impedance, the better the tracking performance at a given tracking force or, conversely,

the smaller the tracking force required to handle modulation of given velocity.

Mechanical impedance is similar mathematically to electrical impedance, the value of both being dependent on frequency, since impedance  $Z$  is equal to  $\sqrt{(R^2 + (\omega M - 1/\omega C)^2)}$ , where  $R$  is mechanical resistance,  $M$  mass,  $C$  compliance and  $\omega$  angular velocity, itself equal to  $2\pi f$ . Electrical equivalents are electrical resistance for  $R$ , inductance  $L$  for  $M$  and capacitance for compliance  $C$ ,  $\omega$  being the same in both cases.

Mechanical impedance  $Z$  can be measured by adjusting the tracking force to mistracking threshold at various spectral frequencies on bands of known relatively low velocity, then extrapolating to get the velocities trackable at normal tracking forces appropriate to the cartridge under test, these at least normally being found in the specification (nominal and maximum values, anyway).

Extrapolation is valid provided the reactive mechanical components are not unduly non-linear in function, and numerous tests on a wide range of cartridges indicate that non-linearity fails to increase the error of readout significantly, particularly at the treble end where mass predominates.

Most error in this respect is more likely to occur at the bass end where compliance predominates, since the basic function of  $F = Mg$  cannot be disputed; but, of course, the  $R$  component can tend mildly to influence extrapolation. More information on making such tests is given in my recently published book called 'Pickups and Loudspeakers' (Fountain Press).

### Electrical parameters

Assuming that the cartridge tracks all the modulation recorded, this should be reflected in terms of electrical signal (EMF) in the left and right coils of the 'dynamo' part of the cartridge. We are, at the moment, considering magnetic cartridges, since it is widely agreed that these are among the most hi-fi of all the species available to date. Output from this type of cartridge is geared to velocity of the modulation, so the output from a gliding tone record based on the recording characteristic (Fig 4) should relate accurately to the curve.

Some test records are recorded to a constant velocity characteristic over most of the spectrum at least, so playing one of these with the cartridge correctly loaded and a millivoltmeter reading the output, a straight-line response

of the frequency range should result.

Another method is to use RIAA-recorded gliding-tone or fixed frequency bands and an ordinary RIAA equalising circuit, the millivoltmeter reading the output of this. Again a straight-line response should result, but this time error could result due to that in the equalised preamplifier.

Even the best cartridges exhibit some variation from 'flat', but this should be mild from 30Hz up to 18kHz or 20kHz, depending on the price range and the radius of the tip (smaller radii define HF modulation, particularly towards the conclusion of the groove spiral, better than larger radii, and the active radius of an elliptical tip is the smallest one, with the larger merely preventing groove bottoming).

### Frequency response

Fig 6 shows the frequency response of a first-class magnetic cartridge. Both channels should match within 1dB at least at 1kHz, and not much outside this limit at all frequencies. The 'suck out' reaching a maximum at about 5kHz is not an uncommon magnetic cartridge characteristic, even the thoroughbreds have it.

It has been suggested (Journal of Audio Engineering Society 19,228 1971 D. A. Barlow) that the most likely cause is the shift of the actual centre of oscillation of the generating element from the nominal position due to out of balance effects.

There is sometimes a very mild rise at maximum treble (20kHz) due possibly to the onset of a resonance. But the thing to note is that all good cartridges are free from violent response changes over the entire spectrum.

The frequency response of a poor cartridge is given in Fig 7. Although somewhat exaggerated, this reveals the general idea of a bad HF resonance, which might be deliberately engineered into the design in an endeavour to maintain the treble output.

Notice the low-pass characteristic resulting from the resonance (i.e. the rapid treble roll-off subsequent to the peak).

This resonance is sometimes caused by the mass at the end of the cantilever remote from the stylus resonating with the compliance of the cantilever.

### HF resonance

A low effective tip mass keeps the upper resonance of the pickup system high and preferably outside the system passband, as in Fig 6 re-

sponse. Sometimes the first major HF resonance relates to the effective tip mass and the compliance of the disc material, but since Vinyl is said to have a compliance around  $3 \times 10^{-8}$ cm/dyne, an effective tip mass in the order of 1 milligram would put the resonance in proximity to 30kHz; a higher tip mass, though, could bring this resonance into the system passband.

While an inexpensive cartridge of the recent magnetic kind might not have a response quite as bad as that indicated in Fig 7, it is extremely unlikely to have one as good as that indicated in Fig 6. Here, then, is another area in which a good cartridge shows its colours and a poor

one its serious limitations and shortcomings.

Specifications merely indicating the response in terms of frequency should be taken with caution. For example, both the good cartridge response in Fig 6 and the poor cartridge response in Fig 7 could be said to have a frequency response from 30Hz (possibly below) to 20kHz. However, relative to output, Fig 6 response would read 30Hz to 1kHz  $\pm 0.5$ dB, 1kHz to 10kHz  $\pm 2$ dB (max. 5.5kHz) and 10kHz to 20kHz  $\pm 1$ dB, a very good specification.

Fig 7 response would read in similar style, 30Hz to 1kHz  $\pm 1$ dB, 1kHz to 10kHz  $+ 6$ dB (at 7.5kHz)  $- 1$ dB and 10kHz to 20kHz  $- 4$ dB to

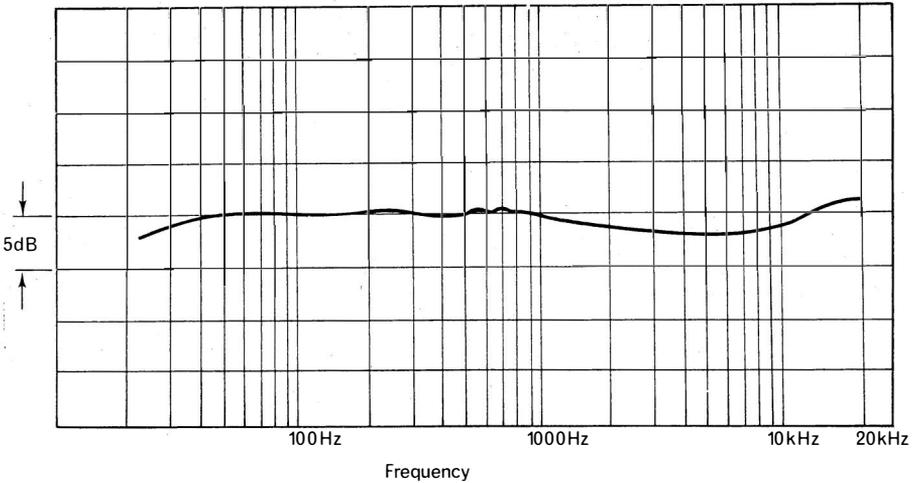


Figure 6—Level frequency response of a good pickup cartridge. Note absence of resonant peaks

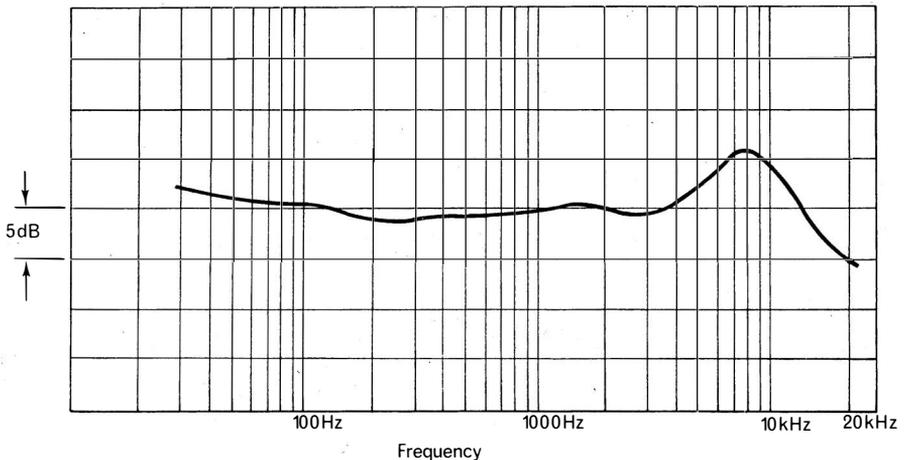


Figure 7—Full frequency response curve for a poor pickup cartridge reveals resonant peaks

-5.5dB, this giving a fair idea of the resonant peak. Of course, a full curve is best, but this is rarely given in the specification.

### Channel separation

A good frequency response should be balanced by a good separation performance, and these two parameters are somewhat compatible. This is because freedom from violent resonances reflects a smaller breakthrough of signal from one channel to the other or, conversely, resonances tend to encourage interchannel crosstalk.

Fig 8 shows the crosstalk of one channel of a high-quality cartridge whose frequency re-

sponse might be similar to that in Fig 6. This reveals that the separation is at a maximum towards the middle of the spectrum, rising to just over 30dB. It is perfectly normal for the separation to fade towards the extremes of the response, but preferably it should hold at 20dB at least between 100Hz and 10kHz. In Fig 8 it is 20dB at about 65Hz and 12kHz, which is very good. The characteristic is smooth, which is a fair indication of freedom from resonances.

Now look at the curve in Fig 9, which might relate to a cartridge of poor response, as in Fig 7. Here the mid-band separation is not much over 20dB, falling to about 16dB at 100Hz and 11dB at

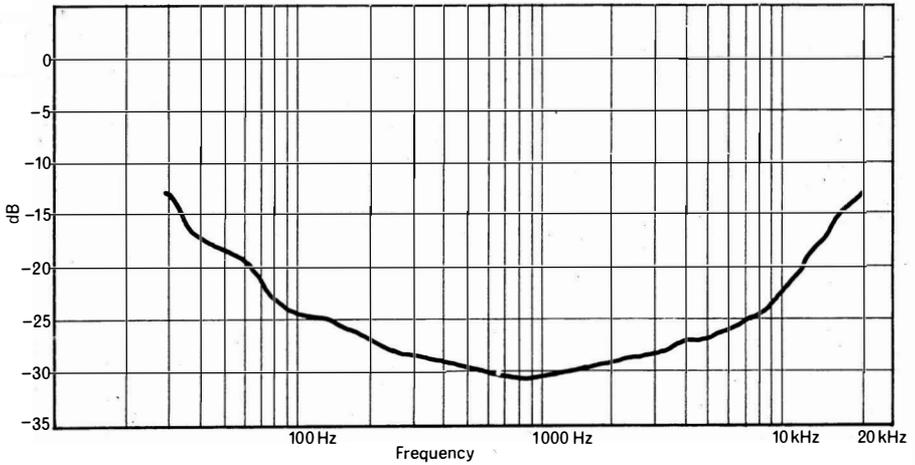


Figure 8—Curve showing separation obtained between channels in a good stereo cartridge

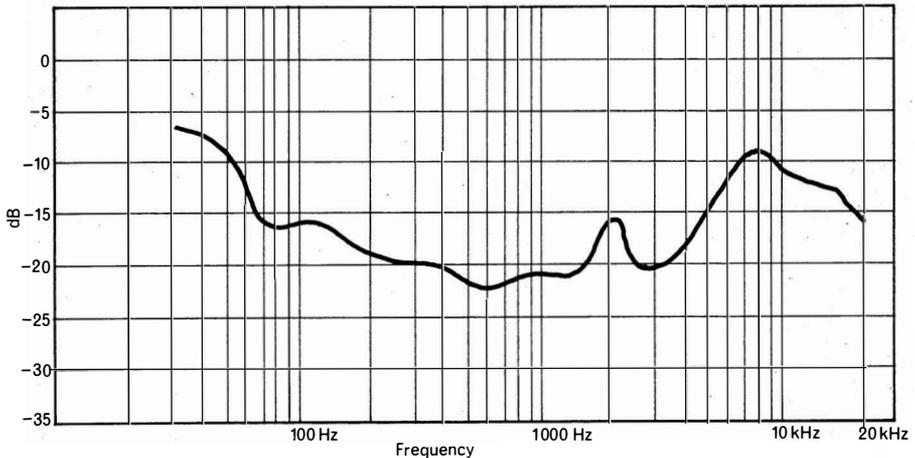


Figure 9—Curve for separation between channels in a poor cartridge troubled by resonances

at 10kHz, with a nasty peak at about 7.5kHz (corresponding to the resonance in Fig 7), pulling the separation down to about 9dB. Some separation curves are even worse than this.

### Distortion

It has been said that provided the separation over the important middle frequencies is at least 15dB, then all is reasonably well. I cannot personally agree with this because when the separation is poor it is not uncommon for the breakthrough signal to carry excessive distortion.

For example, look at the distortion on the waveform in Fig 10, which is that of breakthrough signal. A separation of 15dB only is insufficient to cut the level of the distorted signal sufficiently in the non-speaking channel to make it indiscernible subjectively. I am sure that cartridges, otherwise reasonably good, have been condemned because of distortion in the non-speaking channel, this being superimposed on the information of that channel.

20dB of separation at least is also required to reproduce a stable stereo image, and there should be no violent changes in separation over the spectrum. Each channel, relative to the other, should have similar characteristics. Significant

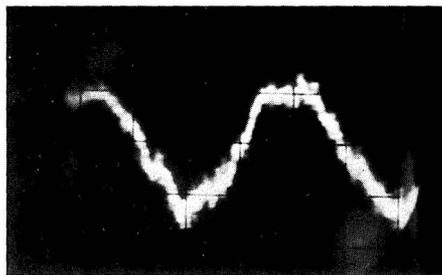


Figure 10—Distortion on breakthrough signal from other channel

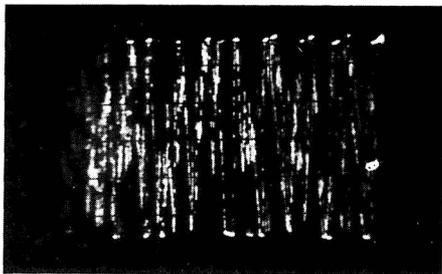


Figure 11—Clipping due to preamplifier overloading

difference around 1kHz implies either a badly balanced 'dynamo' system or that the cartridge/headshell partnership is inaccurately set-up on the arm. A slight twist, one way or the other, might be required to get the front view of the stylus perpendicular to the record.

### Output signal

Other electrical features and parameters include output voltage (per channel), loading, distortion, and transient performance. Output voltage is commonly given at 1kHz and 5cm/S, this velocity said to simulate average music signal.

Many magnetic cartridges produce a shade over 1mV per cm/S at 1kHz, giving about 6 or 7mV across the appropriate load from 5cm/S modulation in the appropriate 45/45 channel of a stereo disc (RMS velocity, incidentally). This is suitable for the majority of current amplifiers, meaning that 30 to 35mV will occur on transients and peak modulation.

### Amplifier overload

One shortcoming of some amplifiers is the relatively poor overload margin in the RIAA (equalised) magnetic pickup preamplifier. Thus if an amplifier which overloads here on an input of, say, 30mV receives signal from a cartridge of particularly high output (such as a moving-coil species fed via a booster amplifier or transformer), the music peaks can be clipped as shown in Fig 11.

High inductance magnetic cartridges are load sensitive, an increasing value of load lifting the output at the treble end. The correct load at the amplifier should thus always be employed. Common values (specified by the cartridge makers) are 47K, 50K and 56K.

Excessive capacitance in shunt with the load should also be avoided as this can bring the electrical resonance (the inductance of the signal coils resonating with the shunt capacitance) into the system passband and impair the treble-end response. Most capacitance occurs in the screened pickup leads, so these should never be extended unnecessarily, and they must be made of low-capacitance cable.

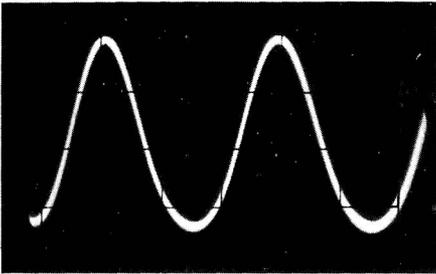
Distortion is commonly high due to the nature of recording and replay and it is often difficult to determine just how much results from non-linear functions in the cartridge itself. There are various ways of measuring the distortion, and it can vary considerably merely by readjusting the cartridge in the headshell and the headshell on the arm.

### Tracing distortion

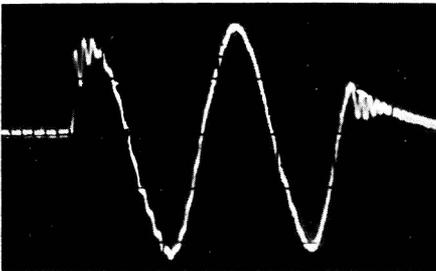
Per cent distortion is rarely given in the specifications, but it is smaller with the smaller stylus tips and the ellipticals, especially as the groove runs out and the signal wavelengths compress due to the reducing disc/stylus velocity. This is essentially tracing distortion (as distinct from tracking distortion which is a function of arm geometry) which results from the physical differences between the recording cutter and the replay tip. It is mostly second harmonic, as shown by the waveform in **Fig 12**.

### Transient response

As music waveforms consist of peaks and transients, the cartridge damping should be sufficient to avoid undue overshoot (and to damp resonances, as we have seen). Discs carrying pulse tone modulation (such as the HFS69, distributed by Howland-West) are useful for providing some idea of the damping efficiency, since this sort of modulation encourages 'rings'. **Fig 13** waveform shows mild rings produced by a magnetic cartridge playing a pulse tone band of the HFS69 disc. Almost all cartridges ring, even the most expensive, but some more than others.



*Figure 12—Tracing distortion, essentially second harmonic*



*Figure 13—Ringing produced by magnetic cartridge on pulse tone band of test record HFS69*

The final arbiter, of course, is the listening test, but one can rest assured that a cartridge falling short of the objective parameters will fail to sound right to the experienced listener. To secure an optimum balance of all the mechanical and electrical parameters calls for no mean skill, great attention to detail and pounds sterling (or the equivalent).

Hence a good cartridge is bound to cost more than a relatively poor one; but this is not to imply that all costly cartridges are better—and sound better—than less expensive competitors, and vice versa.

# Microphones A to Z

## A glossary of technical terms with special reference to microphones

by Donald Aldous

### Acoustic lens

A metal or plastic device located in front of a high-frequency horn to spread the upper frequencies. Usually applied to loudspeakers, but has applications in directional microphones. Generally of two types; obstacle and path-length delay. M. A. Clarke, in 1953, constructed a slant-plate lens/horn combination for which a directional pattern similar to that of a parabolic reflector was claimed.

### Analogies

The effects of mass, compliance and friction can be more easily studied if the system is represented by an equivalent electrical circuit, based on analogies between electrical and mechanical quantities. In such an arrangement, mass is analogous to inductance, force to voltage, damping to resistance and displacement  $udt$  is analogous to charge  $idt$ . By extension this means that velocity is equivalent to current, compliance represents capacitance, and mechanical impedance is analogous to electrical impedance.

One example of the use of electrical-mechanical analogies is in the calculations of the *phase-inverter element* of directional microphones.

### Angle of incidence

The angle formed by an imaginary line passing through a microphone from front to back and a second line joining the centre of the diaphragm to the sound source.

### Average output

The sensitivity of a microphone can be expressed in several ways, such as, the electrical output for a given sound pressure change about the ambient, or in terms of voltage or power. With various units available to express changes in sound pressure, confusion can arise in interpreting performance specifications, unless the rating methods are clearly stated.

The standard sound field is such that pressure

on the diaphragm is  $1 \text{ dyne/sq cm} = 1 \text{ bar}$  (Great Britain and USA) and, in Central European countries, is equal to  $1 \mu\text{bar}$ . However, in some instances, the standard field pressure may be  $10 \text{ dynes/sq cm}$ , in which the sensitivity figure becomes 20dB higher than for the lower intensity reference level.

Even this method is not wholly satisfactory, as the internal impedance of the microphone is not included, so it is necessary to quote this impedance with the voltage figure, or by indicating the output power for a given diaphragm pressure. Now in America the EIA standard applies, which see.

### Balance

Balance or balancing has several meanings; tonal balance between bass, middle and treble registers; equality of gain or sensitivity between right and left stereo channels; the ratio of direct to reverberant sound; and the balance of loudness between instrumental and/or vocal parts of an ensemble.

The last definition is the one that concerns us here, and refers to the art of placing or positioning the microphone(s), so as to obtain the optimum results under a given set of conditions. Skill in the art is properly acquired by experience, but some guidelines can be laid down for the beginner.

Firstly, know your microphone. Study the data sheet of the microphone(s) you employ. Understand its polar (directional) response so that you can position your performers by visualising the pickup area. Remember, though, that polar plots are made in anechoic chambers, so that real-life acoustic environments will modify the performance.

When a microphone is sited close to an orchestra or a single performer, the ratio of direct to indirect sound is high. The sound quality then tends to become harsh, but such close microphone positions can reduce extraneous noises.

This 'dry' sound is due to relatively little rever-

beration, so moving the microphone back softens the effect by adding reflections. It is sometimes better to add reverberation electronically or from an echo room.

Microphone pick-up follows the inverse-square law, so that when an object's distance is multiplied by  $x$ , its sound intensity is divided by  $x^2$ . So that if a person speaks 2ft from a microphone and then moves to 4 ft, the voice intensity drops to a fourth of what it was originally. Conversely, moving closer by 1ft would increase the sound level four times.

A microphone can be regarded as a single ear. It registers only the different loudness of sound reaching it, it does not indicate where they emanate from. Directional microphones should be focused, as it were, on the desired sounds.

Some microphones will not perform well with close-speaking technique, as sounds like the explosive *b* or *t* cause overload distortion. Foam shields or 'pop' filters can be fitted to reduce the effect.

Stereophony presents special problems when deciding on microphone types and placing. For instance, where coincident microphones are employed the various pairs must be matched. Some balance engineers use spaced microphones in different configurations, with the output signals carefully mixed.

The Blumlein system utilises two ribbon microphones mounted on a common axis with their faces at right angles, each element being at 45deg to the performers.

The German MS (Mitte-Seite or Middle-Side) system usually employs a Neumann SM-2 microphone containing two capacitor elements. The mid-microphone is cardioid and orientated towards the sound source, the side microphone has a figure-of-eight polar characteristic and is orientated parallel to the sound source.

### **Bernoulli windshield**

The response of microphones is affected by wind, breath noises, explosive speech, draughts, acoustic blasts and pressure changes. Pressure-gradient types are more prone to wind noise, hence ribbon types are not generally employed outdoors. One type of windshield is the Bernoulli, which takes advantage of air pressures and phase differences acting over the surface of a microphone to reduce the wind pressure on the diaphragm.

Spherical windshields can be up to 12in in diameter. Outer surface can be closely woven fabric, very fine wire mesh (100 per inch) or

porous or foam materials. The subjective reduction in wind noise by the use of these devices can be as much as 20dB or more.

### **Bi-directional**

A microphone that is sensitive at the front and back but substantially insensitive or 'dead' at the sides. Ribbon or velocity microphones have this characteristic.

### **Bimorph**

A crystal sandwich of two thin plates cemented together with suitable interleaved and electrically connected elements. Christened a bimorph, which was a trade-name used by the inventors and Brush Clevite in the USA.

### **Boom**

Enhanced reverberation or accentuation of the bass response by resonance. Also a mechanical device for mounting a microphone consisting of a retractable metal tube mounted on a dolly (movable trolley). Used in TV and film studios. Boom also refers to a short microphone extension fitted to a noise-excluding headset.

### **Cabling**

Low impedance microphones (30 to 200ohms) can have a cable run up to about 200ft without significant effect on frequency response. As a rough rule of thumb, the lower the line impedance, the longer the distance it can be run. But unless the cable is well screened the signal-to-noise ratio may be affected. Cabling must be kept clear of AC mains wiring and transformers.

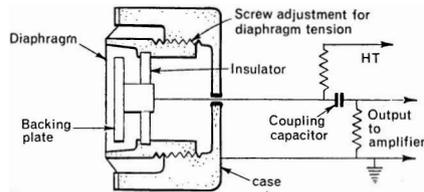
Microphone cable is sensitive to shocks and vibrations, even rubbing against clothing. Connecting cables need protection against inductive and capacitive pickup, and should be twin-twisted and screened. Best results obtained by using balanced circuits, so that both pairs of the twin are equally 'live' but of opposite polarity. The earth connection is via the screening or shielding.

### **Capacitor**

Also known as condenser or electrostatic. Due to E. C. Wentz about 50 years ago. In basic form consists of a thin stretched metal diaphragm close to rigid metal backplate with a polarising voltage between them. The two plates form a capacitor of, say, 5 to 75pF, whose value varies as the diaphragm plate is moved by sound pressure. Owing to its high impedance the first amplifying stage must be housed in the microphone case close to the diaphragm.

By capacitor theory ( $Q=CV$ ) any change in capacitance due to diaphragm movement will produce a change in voltage measured across the capacitor. To use these voltage changes to produce an electrical output, whilst still maintaining the high resistance necessary to keep the electrical charge constant, the capacitor element is coupled via a small capacitor into a high impedance amplifier with input of  $-100M\Omega$  upwards.

Current practice is to mount a transistorised preamplifier in the body of the unit which, with the advent of FET head amplifiers, may be fully



### Capacitor microphone

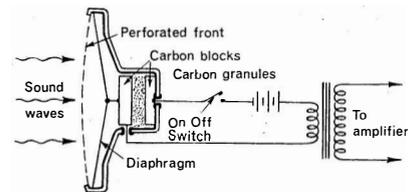
encapsulated, of very small dimensions and capable of high-quality performance. Although fundamentally having an omni-directional polar pattern, since the system is operated by sound pressure, the directional response can be varied to figure-of-eight, cardioid, etc., by altering the polarising voltages.

### Capsule

Essential element in acousti-electrical converters of sound waveforms. Particularly applied to transducing element in capacitor (condenser) microphones.

### Carbon microphone

Consists of carbon granules loosely packed into a small cavity between two plates. One plate is fixed, the other is attached to a diaphragm. Sound pressure waves cause the moving plate alternately to compress and release the granules. The resistance through the granules (usually calcined anthracite) varies in sympathy with the



### Carbon granule microphone

sound waves and modulates a small direct current passing through the transducer. Chiefly used today in communications, particularly the telephone. Effective gain about 50dB.

### Cardioid

Heart-shaped polar response. Is very useful as it provides the discrimination of a directional microphone with the width of response in one direction of an omni-directional. A physical representation of a uni-directional polar pattern is a round balloon with a finger pushed into it. The two-dimensional representation of this pattern is heart-shaped, hence the name *cardioid*.

Mounting together an omni-directional with a bi-directional in one case offers a cardioid pattern. A quasi-cardioid response can be obtained by use of a ribbon microphone fitted with acoustic pads to filter the sound impinging on one side. A cardioid in-line directional microphone was described by Olson in 1938. The trade-name *Cardiline* for such directional microphones is owned by Electro-Voice in the USA. See *Hyper-cardioid* and *Super-Cardioid*.

### Cavity effect

Cavity resonance occurs in front of a microphone diaphragm (particularly capacitor types) where, owing to this effect, the actual pressure on the diaphragm differs from the sound pressure in the free sound wave in which the microphone is immersed. When measuring sound intensities, a correction has to be determined for the particular capacitor unit employed.

### Cephloid

A dummy head with microphones mounted at the normal level of the ears to create a diffraction pattern and so simulate human hearing. Such microphones are used in acoustical laboratories for binaural research.

### Ceramic

A term originally referring to pottery, but today with many applications in the world of audio. Used in connection with pickups, loudspeakers and microphones. For example, bender bimorphs of lead zirconate come in this category. Ceramics are not so easily disturbed by extremes of heat and humidity as the older Rochelle salt units. See *Piezoelectric*.

### Column

A directional type of microphone with a polar response which is wide in one plane and narrow

in the other. Constructed by mounting a series of microphone elements one above the other with close spacing and outputs connected in phase. Such microphones have applications in the theatre, ice rinks and in TV studios. There are also various types of column loudspeakers.

**Condenser**

See *Capacitor*.

**Connectors**

Microphones are commonly fitted with DIN, Cannon XLR, or Tuchel plug connectors, but there is still no universal agreement on the number of pins or on the pin numbering or phasing. The microphone casing is usually connected to the earthed screen (or shield) with the windings connected to the floating (unearthed) pins.

**Crystal**

See *Piezoelectric*.

**Damping**

The process of reducing resonant effects or absorbing energy by mechanical friction or resistance (or its acoustic and mechanical equivalents) to control the amplitude of vibrations or oscillations.

**dBm**

Term refers to the stated level with reference to one milliwatt of power in a 600ohm line. Thus, -30dBm indicates a level of -30dB referred to 1mW, which works out at 1 microwatt. Similarly, +40dBm means a level of +40dB referred to 1mW, which means 10 watts.

**dBV**

Refers to a microphone when the output level is rated with reference to a one-volt level.

**Diaphragm**

An extension of the mechanical system of a transducer to improve the coupling between the air and the transducer mechanism. A combined diaphragm and transducer mechanism is seen in ribbon and capacitor microphones. The size of a microphone diaphragm, and the shape of the housing, affect the mean pressure acting on it. These factors have a bearing on the frequency response and directional characteristics of the microphone. Diaphragm dimensions must take into consideration such effects as diffraction,

phase differences across the diaphragm, and cavity resonance.

**Dynamic**

Dynamic (or *moving-coil*) microphones operate by pressure of sound waves upon a diaphragm, causing an attached coil to move in a magnetic field. The resultant electro-motive force (EMF) is usually transformed-up to match the input of an associated preamplifier.

Exists in two formats: the first being, in effect, a miniature moving-coil loudspeaker, and the second employing a small domed diaphragm (duralumin or plastic), which is of smaller size and more robust, but which has a lower output voltage. Basic elements are engineered into diverse shapes and dimensions.

For general-purpose applications, a step-up transformer (of ten multi-ratio) is housed in the microphone casing, with a switch to select high or low impedance. Thus long low-impedance cables can be used to couple the microphone to the amplifier, ensuring minimum hum pickup.

As the powerful permanent magnet employed in the construction attracts magnetic particles, suitable design of casing is essential.

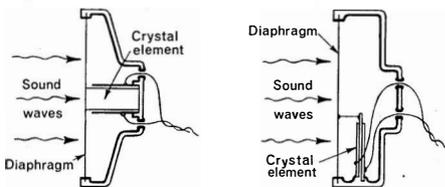
Basic impedance may be of the order of 30 ohms and the output (without transformer) may be as low as -80dB. Polar response can be modified to suit particular requirements, e.g., highly directional or noise cancelling.

G. R. Pontzen (Lustraphone) prefers the definition: in a dynamic microphone a voltage is generated by an electric conductor intersecting lines of magnetic force, which embraces ribbon and all electro-magnetic types of microphone.

**Earth loops**

An arrangement of interconnections between circuit units and/or input sources producing more than one path for the 'earth' side of signal-carrying cables. The resulting loop can cause hum pickup.

In other words a multiplicity of earthing



*Different types of crystal microphones*

points is undesirable. As far as possible only one common earth point should be used, connecting the earthy side of apparatus to it by heavy gauge wire. Professional systems generally employ a three-conductor shielded cable to the pre-amplifier input transformer and connect a physical earth only at the amplifier chassis.

### **EIA**

Abbreviation for Electronic Industries Association, 2001 Eye Street, NW, Washington DC, 20006. EIA microphone output rating uses absolute power values (1mW reference) and divides microphones into nominal impedance groups (GM rating).

### **DIN Standard**

German DIN Standard 45 500 giving minimum standards for microphones can be summarised as follows: frequency range should come within 3dB in any octave with a frequency range of 50 to 12,500Hz, the optimum curve lying within the limits specified. Non-directional microphones have an additional bass tolerance, for example, tolerances permissible are  $\pm 4$ dB from 50 to 250Hz;  $\pm 3$ dB from 250Hz to 8kHz; and  $\pm 4$ dB from 8kHz to 12.5kHz. The amplitude of a practical curve shall not exceed 12dB per octave at any frequency.

Directional characteristics should not be affected by frequency, and the frequency curves for all angles other than zero degrees should show only a small variation from the frequency curve at a relative angle from zero degrees. Non-directional areas shall not deviate in output by more than 12dB (in a free sound field) over the range 6kHz to 9kHz and altered in angle between zero and 90°. Directional microphones should not 'focus' the sound by more than two times (3dB power) between 250 and 8000Hz.

Within this range, the amplitude of the frequency curve for any angle other than zero degrees should not differ by more than  $\pm 4$ dB from the zero curve. This requirement is removed for parts of the frequency curve that fall below -12dB, where the effect is substantially negligible.

The distortion factor should be less than 1 per cent from 250Hz to 8kHz at 100 microbars, equivalent to 114dB. Differences between stereo channels between the above limit frequencies should not exceed 3dB.

Lastly, microphones (in Germany) are required to be labelled showing modulation principle, directional characteristics, field reproduc-

tion factor and electrical impedance. DIN 45-594 standard specifies plug and socket requirements for microphones.

### **Directivity**

This is the difference in sensitivity between the directions of maximum (0°) and minimum sensitivity which are as follows; for cardioids (180°), figure-of-eight (90°), and hypercardioids, approximately 135°.

### **ADD TERM:**

#### **Directivity factor**

The logarithm of the ratio (expressed in dBs) of maximum to minimum sensitivities. Also known as discrimination, cancellation or front-to-back attenuation.

### **Electret microphone**

A new type of capacitor microphone (due to Sessler and West of the Bell Telephone Laboratories, USA) utilising a foil electret (a permanently polarised dielectric material) not requiring any polarising voltage. Frequency response is stated to be:  $\pm 3$ dB from 50 to 15,000Hz. Sensitivity is 50 $\mu$ V referred to 1 microbar. Low impedance output can be connected directly to a transistor amplifier.

### **Electro-acoustic analogies**

See *analogies*.

### **Electrostatic**

See Capacitor.

### **FET**

Abbreviation for Field Effect Transistor, a single-junction majority-carrier device. In many ways, the junction-type FET has ideal characteristics as an input amplifying device for high-impedance transducers. As the input impedance is high the noise level can be made low and usefully high stage gains obtained. The characteristics resemble those of a thermionic valve rather than a normal bipolar transistor. The first microphone employing FETs was the British Standard Telephone & Cables type 4126, with an output comparable to dynamic microphones.

### **Figure-of-eight response**

A microphone that picks up at the front and back equally well, with reduced pick up from the sides. The polar field pattern is called figure-of-eight. Ribbon (velocity) microphones have this characteristic.

### Foam windshield

A close-fitting shield of suitable porous or foamed plastic material which encloses the front or other apertures of a microphone. This type of shield sometimes has an inner screen of fine woven wire mesh, treated with a silicone varnish, to prevent the inner porous material from becoming damp and causing loss of sensitivity. See *Bernoulli windshield*.

### Frequency response

The frequency range of a transducer (such as microphone, loudspeaker, etc.) covered by audio equipment within specified decibel limits. Microphone responses may vary significantly with the angle of incidence of the sound, particularly at high frequencies. This parameter may be expressed graphically and can include a family of curves.

### Gauze baffle

A closely woven gauze screen in the form of a baffle was first used by Braunmühl and Weber in 1935 to improve the low-frequency response of a bi-directional capacitor microphone. A baffle of this type, with a fairly low value of acoustic resistance, can be fitted to ribbon microphones to minimise the loss in sensitivity occurring at low frequencies (below about 150Hz) as a result of damping the ribbon resonance. The screen is round the pole pieces and magnet window.

### Generators

A self-explanatory, if unusual, term to describe the group of microphones in which the electrical energy is produced in the microphone itself (as in dynamic and piezo-electric designs), in contrast to *modulators* which require an external DC voltage. This voltage is modulated by the transducing element.

### Gun microphone

Special type of highly directional microphone (polar characteristic is hyper-cardioid), which is about 15in long and which can be mounted on a pistol grip for easy handling and siting, hence the name. In field work a large windshield is provided. See *Line microphone*.

### Helmholtz resonator

A cavity resonator that is open to the outer air through a single small hole. The resonance is due to the enclosed air compliance and the air-mass inductance in the vent or neck. An effect utilised to improve the extreme treble response of certain microphones (e.g., STC 4021 omni-directional dynamic microphone) and, of course, in reflex loudspeaker enclosures. See *Cavity effect*.

### Higher-order microphones

A mathematical method of referring to the operational mode of different microphones. For example, first-order pressure gradient types



*Sennheiser directional gun microphone in use on location outside the Royal Festival Hall*

have sufficient discrimination against noise for some environments (for example in broadcasting or recording), but where an anti-noise design is required, a second (or higher) order uni-directional pressure gradient microphone may be needed. One arrangement is the coupling in opposition of two suitably-spaced first-order types, which offers a directional characteristic  $\cos^2$  curve in the form a narrow figure-of-eight.

### **Hyper-cardioid**

Where the sensitivity of the bi-directional microphone is greater than that of the omnidirectional microphone, the two polar response plots produce a hyper-cardioid polar characteristic. Also termed *Ultra-cardioid*.

### **Hum**

Unwanted low pitched sound usually due to the AC mains frequency (in UK 50Hz) or its multiples getting into the audio circuit. Hum neutralising loops and connections are necessary in the construction of ribbon microphones to minimise the effects of stray magnetic fields from power transformers, etc. in the vicinity of the unit. See *Earth loops*.

### **Impedance**

Opposition to alternating current flow. May be resistive or reactive. Measured in ohms ( $\Omega$ ). Microphones are designed generally in the following impedance groups: (1) Low: between 15 and 70 ohms approximately, with a trend to standardise on 30 and 60 ohms. Input transformers must be used. (2) Medium: from 100 to 1000 ohms approximately. Standard values today are usually 200, 300 and 600 ohms. Input transformers normally fitted. (3) High: this usually covers microphones with nominal impedance values between 2000 and 100,000 ohms, with around 2000 ohms considered the highest value normally acceptable for transistor input stages. However, 50,000 and 100,000 ohms are often employed for feeding directly into valve or FET input stages without the use of an input transformer. See *Analogies*.

### **Intensity**

In acoustics, sound power level (per unit of area). Sometimes misapplied to sound pressure or velocity. Intensity range that can be handled by human ears is about 20,000,000 to one, or, in terms of sound pressure, around 4000 to one.

### **Lavalier**

The name given to a small microphone worn around the neck (derived from the French word *lavallière* for a loose necktie). Its design, in conjunction with its associated circuit, incorporates equalisation for correct speech quality when worn this way. This personal microphone frees the hands of speakers or performers for lecture or TV use. Most lavalier models are dynamic pressure types with omni-directional polar patterns. Vibration and clothes rustle noises sometimes a problem. Sensitivity to these extraneous noises often increased by some 20dB. A tie or shirt clip sometimes fitted. The case should be solid and non-resonant.

### **Limacon**

Pronounced *lee-may-son*, this word derives from the French *limace* for snail or slug. Mathematicians use it to refer to a particular curve based on the union of two ovals. In polar patterns, limacon curves for gradient directional microphones show how a circular polar curve changes to a sharper figure-of-eight, as the operational mode varies between zero-order, via first-order to higher-order gradient operation.

### **Line microphone**

This type of directional microphone was developed as an alternative to the somewhat unwieldy reflector microphones. Original designs consisted of a pressure-gradient unit with a bundle of tubes of graded lengths coupling the sound field to the front of the diaphragm. See *Rifle microphone*.

### **Lip microphone**

Noise-reducing microphones suitable for reproducing speech in noisy or reverberant conditions. Designed for very close talking and confer a degree of background noise reduction by means of a differential response to close and remote sounds. Anti-noise microphones are not new. Probably the BBC's famous lip-ribbon microphone (in 1937) was the first capable of producing speech quality acceptable for broadcasting. Manufactured by STC, it was a gradient ribbon unit with considerable acoustic damping in the form of silk gauzes fixed close to the ribbon.

A lip guard ensured that the speaker talked at a fixed distance from the ribbon element. One of the major design problems is the elimination of breath and popping noises from the close speech. For very high background noise conditions, a *throat microphone* is necessary.

### **Machine-gun microphone**

A highly directional microphone, consisting of a group of 50 thin-walled aluminium tubes,  $\frac{3}{8}$  in diameter, but of different length, so clustered that they can be easily coupled to a standard pressure-operated microphone of the dynamic type. The strongest sound signal reaching the diaphragm is the direct one along the axis, and so a very narrow beam can be achieved. Due to Mason and Marshall, of Western Electric, 1939. Olson (RCA) around the same period evolved a similar multi-tube directional microphone, with progressive delays. He also developed a single-tube directional microphone.

### **Mass**

The quantity of matter in a body. It is not synonymous with weight, which depends upon gravitational pull, and varies over the earth's surface. The unit of mass in c.g.s. system is the gramme or milligramme (sometimes written as milligram). See *Analogies*.

### **Matching**

The selection and connection of audio components or equipment so that each unit works at its peak performance. When audio equipment is coupled together, their performances will be affected by the impedance relationship. Matching impedances influence power output, frequency response, distortion and (in loudspeakers) damping. When inputs are involved, then voltages and sensitivities, and the required impedances, will need to be known.

When matching equipment, avoid *hum loops* by ensuring that earth return lines all go back to one point, preferably on the main amplifier. One tip: it is permissible to use a microphone (or microphone with transformer) of lower impedance than the equipment input providing the voltage output from microphone or combination is adequate for the sensitivity provided.

### **Microbar**

Unit of air pressure. Equals 1 dyne/cm<sup>2</sup> ( $\mu$ Bar).

### **Microphone**

Transducing device that converts acoustical energy into electrical energy. Concept attributed to Robert Hozke (1667). Du Moncel (1856) discovered that increased pressure on electrical contacts diminished resistance. David Edward Hughes, American inventor, improved on this idea, and was first to use word *microphone*, 1878.

Original design consisted of a circuit, with

three nails making uncertain contact, mounted on a board. The board vibrated and so varied the contact resistance which, in turn, modulated the current in the circuit. Early names in the history of microphone developments include (not in chronological order) E. C. White, H. Humming, A. E. Dolbear, P. Reis, W. H. Schottky, E. W. Siemans, Elisha Gray, Charles Cuttris and the more familiar A. G. Bell and Emile Berliner.

More recent developments in microphones contributed by Reisz (carbon), Sykes and Round (electro-dynamic), Olson and Gerlach (ribbon), Wentz, Riegger and Voigt (electrostatic), C. B. Sawyer (piezo-electric bimorph), Thuras (phase-inversion method of microphone loading), and Braunmühl and Weber (cardioid directional capacitor microphone).

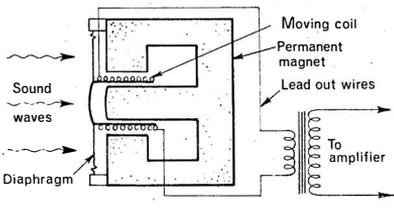
### **Mixers**

An electronic unit capable of combining a number of separate signals into a common output. For instance, a microphone mixer will combine the signals from several microphones into a single blended output. Permits stereo microphones to be properly apportioned to left and right channels. Ideally, all this must be achieved without changing the source impedance presented to the system input. Mixer units can broadly be classified into active and passive units. The former types contain their own voltage amplifiers and buffer stages to provide correct impedance matching and to prevent interaction between channels. Passive units are purely resistive and act like variable attenuators across the inputs.

Professional mixers now almost universally use linear levers (sliders) instead of rotating knobs, although these are still used on some BBC consoles. Most professional mixers (of the passive type) employ T-pads or, if the circuits are balanced, H-pads. Each pad is designed in steps so that movement from one stud to the next changes the sound level by a fixed amount (say, 1.5dB) when the pad is correctly terminated at the output end. Mullard has a number of circuits for mixers and mixer pre-amplifiers. The word also applies to the operator of the device.

### **Modulators**

A category of microphones which requires an external DC voltage, usually derived from the equipment with which the transducer is used. This voltage is modulated by the microphone. See *Generators*.



**Moving coil or dynamic microphone**

**Moving-coil**

See *Dynamic*.

**Noise**

In sound reproducing systems, noise can be grouped under two headings: inherent or self-generated noise, and noise produced by sources external to the system and so associated with environment. Anti-vibration mountings isolate transduction element from movement or structure-borne noise.

**Noise-cancelling microphone**

A type of microphone designed for use in conditions of high ambient noise, such as, industrial locations or ships' intercommunication systems. The commentator's lip *ribbon microphone* is a well-known example. Operation depends on the wave motion theory of sound, where it can be shown that the energy in a spherical wavefront is greater than the energy in a plane wave.

**Obstacle effect**

Refers to diffraction effects due to the size of

microphone in relation to wavelength. An acoustic lens or refractor (used in directional microphones) usually consists of rigid strips or discs, whose size is small compared with the wavelengths. It is noteworthy that, even for the smallest practicable microphones (about 0.5in diameter), there are still diffraction effects of up to 10dB.

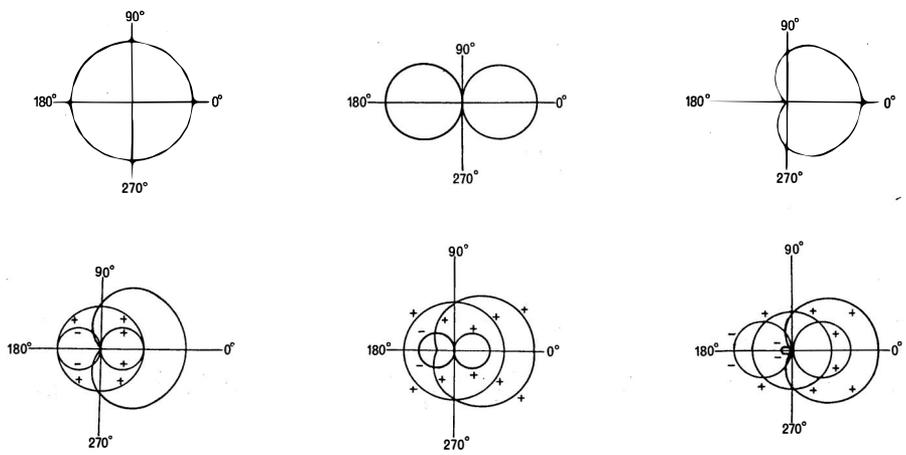
**Omni-directional microphone**

The most simple horizontal polar response is omni-directional. This means equal sensitivity to sounds on all sides, back or front, left or right, above or below. No microphone fully satisfies this criterion at all frequencies, but some types are so-described as they are more omni- than uni-directional.

This characteristic is shown by any microphone that is operated directly by sound pressure changes, since pressure in a medium like air may be considered to be equal in all directions. Note that, although the polar diagram shows the response in a horizontal plane only, the actual polar pattern is three-dimensional.

**Paraboloid**

Reflectors in the shape of the mathematical curve of the paraboloid have long been used to pick up faint sounds over long distances by concentrating the received signals in a point in space called the reflector focus. Mobile sound locating equipment uses this technique. In nature-sounds recording, reflector microphones, with an omni-



*Polar diagrams for different types of response. Top (left to right) omni-directional, figure-of-eight, cardioid. Bottom (left to right) cardioid, super cardioid, ultra- (or hyper) cardioid with small rear lobe*

directional unit mounted at the focal point of the paraboloid, are well known.

The reflecting dish must be large compared to the wavelength of sound over the desired frequency range, e.g. a 3ft paraboloid is effective down to about 800Hz. For optimum performance, according to the distance of the sound source, defocusing of the microphone in relation to the focal point of the parabola may be necessary. A rigid stand is helpful, as is some method of sighting the reflector. Sighting can be accomplished by a small window in the dish or by monitoring the signal being fed to the recorder. See *Line, Rifle and Gun microphones*.

### Phasing

When two or more microphones are used, and they are within about 10ft of each other, they should be electrically in phase, which means that for a given sound impulse each diaphragm moves in or out at the same time. In this way, small EMFs generated by one unit do not tend to cancel out that of the other. It is essential to check for correct phasing when recording for stereo and when employing different makes of microphone simultaneously. To determine phasing, compare sound levels and listen for subtle distortions, then reverse the connections to *one* microphone only. When in phase, the output level of the microphones will be higher and undistorted. Bi-directional microphones may be reversed 180° to bring into phase, and later corrected electrically.

### Phase inverter element

On a pressure-gradient microphone (say, figure-of-eight type) inserting an acoustic phase inverter element acts substantially like an acoustic line between the rear sound entry and the back side of the diaphragm, changing the response to a uni-directional or cardioid characteristic. The simplest phase inverter elements are of the LR (mass-resistance) or RC (resistance-compliance) types.

### Phase-shift microphone

Principle of operation can be considered as an extension of the pressure-gradient technique where the microphone diaphragm is exposed to acoustic pressures on front and back surfaces. The phase-shift microphone differs from the pressure-gradient type in that the acoustic path coupling the front and rear surfaces of the diaphragm is in two separate parts, an external path

and a path through the microphone itself. May be moving-coil, ribbon or capacitor.

### Piezoelectric

Microphone that depends for its operation on the peculiar phenomenon of Rochelle salt (sodium potassium tartrate), quartz, or tourmaline to generate small voltages when subjected to mechanical strains or electrical fields. Term derived from the Greek 'piezein' meaning 'to press'. The *direct piezo effect* was first observed by the brothers J. & P. Curie in 1880.

A crystal slice is cut and mounted so that sound pressure on a diaphragm (coupled by a cantilever) produces a bending strain, instead of compression. To produce an electrical output from such a movement, it is necessary to have two slices of crystal cemented together. Thus, when deflected by a bending force, one wafer is in tension and the other under compression.

By suitable connection of the surfaces, an EMF is produced which is proportional to the applied pressure. This wafer combination is called a *bimorph*.

Advantages of crystal microphones are high sensitivity and simple construction. They are pressure-operated and have an omni-directional polar response. As this type of transducer is basically a capacitor, with the crystal slice as the dielectric, its output impedance is high and connecting cables must be restricted in length, say, up to about 50ft of low-capacity screened lead.

Rochelle salt is affected by humidity and it becomes unstable at high temperatures. Ceramic materials, like barium titanate also exhibit piezo-electric effects. They have a slightly better frequency response than crystal types.

Another type of piezo-electric microphone is the sound-cell, in which two or more crystal or ceramic elements are sealed together, often without a diaphragm. This arrangement offers a wider frequency response at the expense of lower sensitivity. This type is sometimes referred to as a *multimorph* model. Sensitivities of -50 to -70dB are typical.

One other type of crystal microphone is given the abbreviation *ADP*, short for ammonium dihydrogen phosphate, and the format is expander bars. Frequency response is claimed to be substantially linear up to nearly the resonant frequency. Applications range from PA systems to high level sound measurements. Matching is into low-noise pre-amplifier with very high impedance, 100MΩ upwards.

### Pistonphone

A device in which a rigid piston is vibrated, so that, by measurement of its movement, acoustic pressures and velocities can be calculated. Microphones can be calibrated by using one of several devices, such as, the pistonphone (below 150Hz), thermophone, electrostatic actuator or a reciprocity calibrator.

### Polar response

Plot of polar field pattern employing polar coordinates to depict the relative response of a microphone for various angles of incidence of a sound-wave for a given frequency.

### Polydirectional

Refers to a microphone in which the polar pattern may be changed from omni- to bi-directional to cardioid, or a combination of the three.

### Power supplies

Field-effect transistor pre-amplifiers require up to about 50 volts DC and draw about 1mA. Studio capacitor types require a DC polarising supply of about 50V which can be provided by battery or mains power unit. Permanent *electret* polarisation is now being experimented with to solve the problems of long-term sealing and the need for barometric-pressure equalisation. See *Electret microphone*.

### Pressure

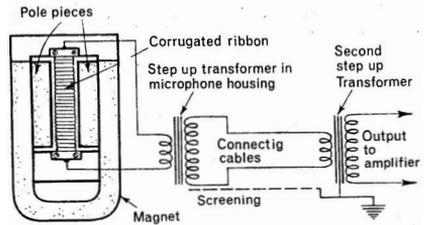
The fluctuating pressure in air (or other fluid medium) which indicates the presence of a propagating or stationary sound wave. Measured in alternating dynes per sq centimetre, either peak or RMS. Also termed Acoustic Pressure or Excess Pressure. See *Microbar*.

### Pressure microphone

Any type of microphone that is operated by the excess pressure in a sound wave, in contrast to a pressure-gradient microphone (see *Ribbon*) in which the electrical response corresponds to air particle velocity, or pressure difference.

### Probe microphone

Small-bore high impedance microphones (usually moving-coil or capacitor) devised for various measurement applications, for example, for insertion into cavities, such as, artificial ears, filters, mouths, loudspeakers and microphones. Precautions are necessary to avoid external influences like vibration and magnetic fields from modifying the results.



*Ribbon microphone*

### Proximity effect

Increase in low-frequency response observed in most pressure-gradient microphones, when the distance from the sound source is decreased to, say, less than 2ft. See *Ribbon*.

### Radio-frequency biasing

RF biasing (originally employed in the 1920s) has been introduced for capacitor microphones in the form of bridge circuits using a radio-frequency of about 5MHz. Efficient RF filtering is essential to avoid radiating the carrier frequency outside the case.

### Radio microphone

Hand-held or, more usually, *lavalier* microphone incorporating a miniature radio transmitter. Designed to operate in conjunction with a suitable receiver feeding into sound reinforcement system. Because this type of microphone allows performers greater freedom of movement than a cable-connected model they are becoming increasingly popular in the entertainments industry.

Designers of radio microphones have overcome formidable technical problems to provide a reliable, high-quality link that is virtually free from noise, fading and interference. Average operating range is about 100 yards, depending on conditions.

Power radiated and the frequencies used are controlled and licensed by the Post Office. Applications for a licence (£3 for five years) should be on form BR9 and sent to Radio and Broadcasting Department, Radio Branch, GPO, London EC1.

### Reverberation

Repetitive reflection of sound in an enclosed space which contributes to the ambience of the reproduction. Some years ago AKG developed a dynamic cardioid microphone with 'built-in reverb, or a sort of echo microphone. The

reverb effect could be controlled from zero to  $2\frac{1}{2}$  seconds.

### Ribbon microphone

Operating principle, like the dynamic type, is a conductor moving in the field of a permanent magnet. But in a ribbon type a narrow strip of aluminium, corrugated at right angles to its length, is suspended in the magnetic field between two pole-pieces.

As the active element is virtually a single-turn coil, the basic ribbon impedance is very low—a fraction of an ohm. This necessitates a step-up transformer built into the microphone to provide a more convenient matching impedance, generally around  $30\Omega$ . When both sides of the ribbon have free access to the sound field, the description *pressure gradient* or *velocity* type can be applied. When acoustic pads are fitted on one side of the ribbon, the operating principle becomes *pressure*.

Low-level high-quality output with figure-of-eight polar response are normal characteristics of ribbons. The directional characteristic attenuates reverberant sound and background noise by as much as 4.8dB on the  $90^\circ$  'dead' axis. Ribbons need handling carefully. Do not blow into a ribbon microphone to check whether it is working. They are usually unsuitable for, outdoor conditions. When located very close to the sound source the lower frequencies are emphasised, resulting in 'boomy' speech, for example. This is the so-called *proximity effect*.

### Rifle microphone

Type of microphone transducer consisting of a series of tubes of varied lengths mounted in front of a diaphragm. The transducer may be dynamic or a capacitor. The tubes (say in lengths from 2 to 60in) are bound together in front of the diaphragm to create a distributed sound entrance. The result is that an omni-directional unit becomes highly directional. Electro-Voice and RCA manufacture microphones of this class. See *Line microphone*.

### Romanow surround

Tangential fluted diaphragm surround fitted to high-quality microphones. Invented by F. F. Romanow, of Bell Laboratories, USA. The biscuit (or frontal screen) in the famous STC ball-and-biscuit microphone, which is spaced from the round body of the unit to neutralise diffraction effects and maintain an all-round (omni-directional) response, is also attributed to Romanov.

### Sensitivity

Measure of signal level required at input of a transducer (or amplifier, tuner, etc.) to obtain a stated output. The lower the necessary input, the higher the sensitivity. The two variables that determine absolute sensitivity are the output quantity and the acoustic conditions on which this parameter depends.

Several methods are in use for expressing the output quantity and the acoustic reference pressure, which can lead to confusion in making comparisons. A standard method of assessing microphone sensitivity would be useful.

In the appropriate German DIN standard, this term has been replaced by 'response coefficient' which indicates that the quantity is measured within a free sound field with the microphone open-circuited.

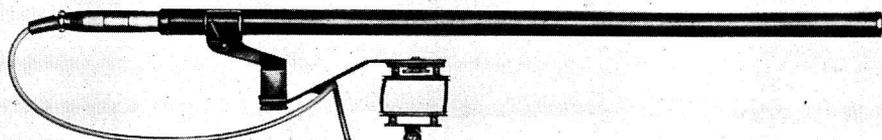
### Silk screen

To neutralise diffraction effects and produce an accurate omni-directional response, a layer of artificial silk between two open-weave wire-mesh screens of suitable size and spacing is fitted to certain high-grade moving-coil microphones.

### SPL

Abbreviation for Sound Pressure Level. Defined as equal to  $20 \text{ Log}_{10} \frac{P}{0.0002} \text{ dB}$ .

Where  $P$  = RMS sound pressure in microbars. At a sound pressure of 0dB the relative pressure in dynes/cm<sup>2</sup> is 0.0002 (reference of 1kHz). This gives a sound particle velocity of 0.0000048cm/S, a pressure gradient of 0.000037 (at 1cm distance),



AKG Model C9 rifle microphone mounted on stand with panning facility

and a particle displacement of  $0.76 \times 10^{-9}$ cm. For a level of 100dB multiply these figures by 100,000. It will be seen that all air movements and pressure variations are minute.

### Stereo microphones

Microphones are inherently single-channel transducers which have to be combined in pairs for stereophony. Several manufacturers have designed dual type units for stereo in which two independent but similar transducing elements are housed in a single case, usually one above the other. In certain models, the upper unit may be rotated to achieve the MS (middle-side) stereo technique, due to the late Holger Lauridsen. The Neumann SM-2 microphone is of this type.

The so-called classical stereo microphone arrangement (sometimes called the AB or XY method), places the units left and right of a line parallel to the sound sources, with the spacing varying from 6 to 8in (binaural reproduction) to some 6 to 30ft apart.

The EMI technique (due to Alan Blumlein) employs two bidirectional ribbon microphones creating a polar pattern resembling a four-leaf clover. Also known as the *coincident microphone* method. Ultra-directional microphones (using the Blumlein difference technique) applied to quadraphonic recording have been described by Michael Gerzon in *Studio Sound* (August/September 1970, and October 1970).

### Throat microphone

Transducer in which the diaphragm is actuated by being directly in contact with the external skin over the throat. The unit may be of the moving-coil or carbon button type and, to achieve maximum intelligibility in noisy environments, high frequencies are attenuated.

### Tubular microphones

Directional microphones with slits or multiple entries come into this category. Originally moving-coil elements were used, but the latest designs incorporate capacitor units that reduce size and weight, and offer improved performance. See *Line microphone*.

### Twister bimorph

Twisting or bending mode of operation of a multiple crystal sandwich, which lowers the mechanical impedance at the driving point, which in turn produces a bigger deflection and greater voltage output. See *Piezo-electric*.

### Ultra-cardioid microphone

The output of a cardioid microphone is 6dB less from the 90° position than from the front axis. This normal cardioid pattern can be modified by varying the controlled rear axis response and it is possible to make the differential between the front and side greater than 6dB, and so enhance the directivity. This does, however, produce a small rear lobe not present in the true cardioid, but this is not usually significant. See *Hyper-cardioid*.

### Ultra-sonic microphone

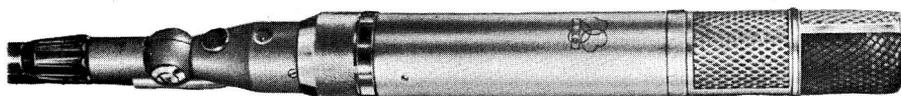
Type of electro-acoustic transducer sensitive to frequencies only in the range 25kHz to 40kHz. Output level is of the order of  $-65$ dB referred to  $1\text{V/dyne/cm}^2$ . Used in systems designed for directing the blind, opening garage doors, operating slide projectors, air-conditioning plant, etc.

### Uni-directional microphone

Type of microphone with greater sensitivity to sound from one direction than another. Average design has a front to rear pickup ratio of 20 to 26dB. The ability to discriminate against sounds from rear and sides makes such microphones particularly suitable for distant sound pickup in TV studios, in sound reinforcement systems and in theatres. One of the first uni-directional units was introduced in 1933 by Weinberger, Olson and Massa. Crystal, dynamic, capacitor or ribbon-velocity designs can have this characteristic.

### Velocity of sound

The propagational velocity of sound in air at  $20^\circ\text{C}$  is 1130ft per second, or 34,400cm/S. The product of wavelength and frequency is the



AKG stereo microphone. In use microphone would be vertical with elements one above the other

velocity:  $c = \lambda f$  (where  $c$  is velocity,  $\lambda$  is wavelength and  $f$  frequency).

**Voice-filter**

A small reactor (choke) connected in parallel with the output of a ribbon-velocity microphone to reduce the low frequency response for close speech.

**Wave type microphone**

Category of microphone designed to have highly directional properties. Their size is larger than the wavelengths over the normal operating range, so taking advantage of wave interference effects. The simplest and oldest of this class is the parabolic reflector model.

**Weighted noise**

Term applied to a noise-level figure or a signal-to-noise ratio which takes into account the ear's decreasing acuity at low frequencies.

**Wind noise**

Low pitched rumbling noise which varies according to wind speed and type of microphone. It is associated with action of wind around a

microphone, particularly outdoors. Wind screens or gags are available of various kinds, from wire frames covered with silk to special foam-rubber compositions. These can reduce such noise by 20 to 30dB. See *Bernoulli*.

**Zener diode**

Type of silicon semiconductor diode (named after C. Zener in 1934) that provides constant voltage drop over a wide range of reverse current. Used for voltage regulation, for example, in circuits providing the polarisation for capacitor microphones where accurate voltage stabilisation is necessary.

**Zero level**

A reference power level ( $N_{vu}$ ) used by professional audio engineers. For instance, with one milliwatt of power in a 600ohm line, zero equals 0.773 volt. Note that zero level does not mean the absence of a signal. With complete absence P (RMS power)=0, and  $N_{vu}$  would be equal to minus infinity. When P exceeds 1mW, values of  $N_{vu}$  are positive, and for values of P less than 1mW,  $N_{vu}$  becomes negative.

**Microphone (and receiver) principles**

Principle	Sub-groups	Reversible or non-reversible	Polarization	Application	Advantages and disadvantages
Variable resistance	(a) Carbon microphone (b) Transistor microphone (junction) (c) Strain gauge	Non-reversible Non-reversible Non-reversible	Current	Communications	Cheap to make but unstable, noisy and non-linear (a) Mechanical construction difficulties (b) Good sensitivity (a) Low efficiency (c)
Moving iron	(a) Single-sided (b) Balanced-armature (c) Rocking-armature	Reversible	Permanent magnetic	Communications	Medium or low impedance Impedance rises with frequency Non-linear at high levels
Piezoelectric	(a) Single crystal (b) Bimorph or multimorph	Reversible	Electric by polarisation of ceramic	Communications, medium-quality, measurements	Compact elements possibly subject to temperature effects Need high input impedance amplifiers
Capacitor	(a) Single-sided (b) Push-pull	Reversible	Constant-charge polarisation	All fields	Small size. Good frequency response Need very high amplifier input impedance
Moving conductor	(a) Moving coil (b) Ribbon	Reversible	Permanent magnetic	All fields	Good response and linearity Low impedance Need relatively large magnets

Reproduced from STC Monograph *ElectroAcoustics* by M. L. Gayford (Newnes-Butterworth, 1970).

# Abbreviations

A	- - ampere	m	- - metres	VHF	- - very high frequency (VHF radio approx 88-108MHz, VHF TV approx 174-216MHz)
A-B	- - comparison test	M	- - megohms (millions of ohms)	V	- - volts or voltage
AC	- - alternating current	mA	- - milliamps (0-001A)	VA	- - volt/ampere
AFC	- - automatic frequency control	mag	- - magnetic	vci	- - voice coil impedance
AGC	- - automatic gain control	ME	- - magic eye	VU	- - volume units
AM	- - amplitude modulation	MC	- - moving coil	W	- - watts
ASA	- - Acoustical Society of America	mg	- - milligram	W and F	- - wow and flutter
aux	- - auxiliary	MHz	- - megahertz (see Hz)	xtl	- - crystal (pickup or microphone)
BAF	- - bonded acetate fibre	mic	- - microphone	Z	- - impedance
CCIR	- - International Radio Consultative Committee	MOS	- - metal oxide semiconductor	<b>Miscellaneous</b>	
char	- - characteristic	mpx	- - multiplex	%	- - per cent
cm	- - centimetre	mV	- - millivolts (0-001V)	>	- - greater than
c/o	- - cut-off frequency	MW	- - medium waves (approx 185-570m)	<	- - less than
coax	- - coaxial	N	- - newton (SI unit of force)	±	- - plus or minus
dB	- - decibel	NAB	- - National Association of Broadcasters (see also NARTB)	≧	- - equal to or greater than
dBm	- - decibel/milliwatt	NARTB	- - National Association of Radio and Television Broadcasters (USA)	≦	- - equal to or less than
DC	- - direct current	NL	- - noise level	μ	- - mu (micro or millionth)
deg	- - degrees	Pat	- - power available for tuner	μA	- - microamp
det	- - detector	pF	- - picofarad (10 <sup>-12</sup> farad)	μV	- - microvolt
DIN	- - Deutscher Industrie Normen (German audio standards)	PPM	- - peak programme meter	μBar	- - microbar (air pressure equal to 1 dyne/cm <sup>2</sup> )
disc	- - discriminator	Psn	- - power supply needed		
FET	- - field effect transistor	PT	- - purchase tax (UK only)		
ffss	- - full frequency stereo sound (Decca)	PU	- - pickup cartridge		
fl oz	- - fluid oz	Pw	- - playing weight		
FM	- - frequency modulation	Q	- - Q-factor (quality of tuned circuit)		
FR	- - frequency response	rcf	- - recommended crossover frequency		
gm	- - gramme	rec load	- - recommended load		
HC	- - handling capacity	Replay	- - replay characteristic		
HD	- - harmonic distortion	char	- - replay characteristic		
HF	- - high frequency	RIAA	- - Record Industry Association of America		
H & N	- - hum and noise	RMS	- - root mean square (0-707 - peak value of AC)		
Hz	- - hertz (cycles per second)	rpm	- - revolutions per minute		
IC	- - integrated circuit	sec	- - second (time)		
IEC	- - International Electro-technical Commission	S/L	- - selector switch		
IF	- - intermediate frequency	S/N	- - signal-to-noise ratio		
IHFM	- - Institute of High Fidelity (USA)	SW	- - short waves (approx 10-60m)		
imp	- - impedance	THD	- - total harmonic distortion		
in	- - inches	thou	- - thousandths of an inch (0-001in)		
ind	- - indicator	tpi	- - turns per inch (screw threads)		
i/s	- - inches per second	UHF	- - ultra high frequency (approx 470-854MHz)		
K	- - kilohms (thousands of ohms)				
k	- - kilohertz (see Hz)				
lb	- - pound (weight)				
L/C	- - inductance/capacitance				
LP	- - long play (records or tape)				
LW	- - long waves (approx 1100-2000m)				

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# Directory of Pickups and Arms

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ ACOS

Cosmocord Ltd, Eleanor Cross Road, Waltham Cross, Herts.

Tel: Waltham Cross 27331. Telex: 24294.

### GP91-1 SC ★

Mono/stereo compatible crystal cartridge. Turnover dual stylus. Pw 3-6gm. Tip mass 2.5 milligram (sapphire), 2.8 milligram (diamond). Dynamic compliance: vertical  $2 \times 10^{-6}$  cm/dyne, lateral  $4 \times 10^{-6}$  cm/dyne. FR 50Hz-12kHz. Output: 178mV. Min load 1 megohm. Approximate prices: (sapphire/sapphire) £1.70 (including PT); (diamond/sapphire) £2.23 (including PT).

### GP92-1 SC

Mono ceramic cartridge. Turnover stylus assembly. Stereo/LP 0.6/0.8 thou diamond or sapphire, 78 2.5 thou sapphire. Pw 4-10gm. Tip mass 2.5mg dynamic. Compliance:  $2.5 \times 10^{-6}$  FR 150Hz-16kHz  $\pm 3$ dB, 12dB down at 30Hz relative to 1kHz. Output: 100mV. Load impedance 1 megohm. Low temperature coefficient. Approximate prices: (sapphire/sapphire) £1.86 (including PT); (diamond/sapphire) £2.50 (including PT).

### GP93 ★

Stereo crystal cartridge. Turnover dual stylus. Stylus 0.6/0.8 thou diamond or sapphire, 2.5 thou sapphire. Pw 4-8gm. Tip mass 2.5mg dynamic. Compliance: vertical  $2.2 \times 10^{-6}$  cm/dyne, lateral  $2.2 \times 10^{-6}$  cm/dyne. FR flat 250Hz-18kHz 3dB down at 100Hz relative to 1kHz. Output: 250mV. Rec load 1 megohm. Low temperature coefficient. Approximate prices: (sapphire/sapphire) £2.50 (including PT); (diamond/sapphire) £3.10 (including PT).

### GP94

Stereo ceramic cartridge. Turnover dual stylus. Stylus 0.6/0.8 thou diamond or sapphire, 2.5 thou sapphire. Pw 2-4gm. Tip mass 2.5mg dynamic. Compliance: lateral  $5 \times 10^{-6}$  cm/dyne, vertical  $6 \times 10^{-6}$  cm/dyne. FR flat 100Hz-12kHz, 7-8dB at 30Hz relative to 1kHz. Separation 20dB at 1kHz, 8dB at 10kHz, minimum. Output: 80mV minimum. Load impedance: 1 megohm

each channel. High capacity ceramic elements (1,000pF). Low temperature coefficient. Approximate prices: (sapphire/sapphire) £2.80 (including PT); (diamond/sapphire) £3.40 (inc. PT).

### GP95

Specification and price as GP93. Stylus (LP) 0.5-0.6 thou; (stereo/LP) 0.6/0.8 thou.

### GP96

Specification and price as GP94. Stylus (LP) 0.5-0.6 thou; (stereo/LP) 0.6/0.8 thou.

### 104 ★

Stereo ceramic cartridge. Two versions; turnover and single-sided. Stylus: 0.5/0.7 thou and 2.5/3 thou. Sapphire or diamond. Pw 3-4gm. Tip mass 2-3mg. Compliance: (static) lateral  $20 \times 10^{-6}$ , vertical  $17 \times 10^{-6}$ ; (dynamic) lateral  $6 \times 10^{-6}$ , vertical  $5 \times 10^{-6}$ . Separation: 20dB at 1kHz, 7dB at 10kHz. FR 70Hz-15kHz  $\pm 5$ dB. Output: 100mV. Rec. load minimum 1 megohm. Approximate prices: (sapphire/sapphire) £3.90 (including PT); (diamond/sapphire) £4.52 (including PT); (diamond/diamond) £4.93 (including PT).

### 104 Transcription ★

Stereo ceramic cartridge. Single sided. Diamond stylus 0.5/0.7 thou. Pw 2-5gm. Tip mass 1.6-2.6mg. Compliance: (static) lateral  $20 \times 10^{-6}$  cm/dyne, vertical  $17 \times 10^{-6}$  cm/dyne; (dynamic) lateral  $6 \times 10^{-6}$  cm/dyne, vertical  $5 \times 10^{-6}$  cm/dyne. FR 70Hz-12kHz  $\pm 5$ dB. Channel separation not less than 20dB at 1kHz. Output: 100mV. Rec. load: 1 megohm minimum. Approximate price: £4.50 (including PT).

## ■ AUDIO DEVELOPMENTS

UK distributors: B. H. Morris & Co (Radio) Ltd, 84-88 Nelson Street, Tower Hamlets, London, E1 2DY. Tel: 01-790 4824.

### AD76K

Moving magnet stereo cartridge for stereo and LP only. FR: 20Hz-20kHz. Sensitivity 5mV at 1kHz. Diamond stylus. Channel balance within 2dB. Separation 20dB. Compliance:  $10 \times 10^{-6}$  cm/dyne. Tracking force 0.5gm. Weight: 5 gm. Dimensions:  $30 \times 10 \times 16$ mm with standard  $\frac{1}{2}$ in centres. Price: £4.50 (including PT). Replacement stylus JS-P1 £2.05 (including PT).

### AD309K ★

11  $\frac{1}{2}$ in precision counterbalanced arm. Chrome plated on brass with needle bearings and weight adjustment. Complete with arm rest and base. Supplied with AD76K cartridge. Price: £9.97 (including PT).

## ■ AUDIO DYNAMICS CORPORATION

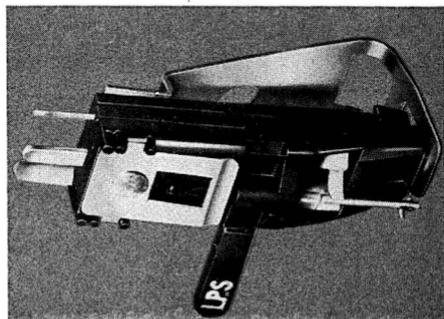
Sole UK agents: Hisonic Ltd, Tovil, Maidstone, Kent. Tel: Maidstone 57258.



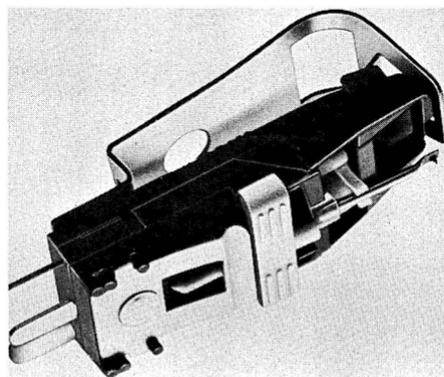
Acos GP91-ISC



Acos GP93 Crystal Stereo



Acos 104



Acos 104 Transcription

#### ADC 25

Stereo cartridge. Induced magnet. Sensitivity 4mV at 5.5cm/sec. Separation: 30dB, 50Hz-15kHz. FR 10Hz-24kHz $\pm$ 2dB. Vertical tracking angle 15°. Pw  $\frac{1}{2}$ -1 $\frac{1}{2}$ gm. Cartridge weight: 8.3gm. Stylus: 0.3 $\times$ 0.7 or 0.3 $\times$ 0.9 or 0.6 thou spherical. Compliance: 50 $\times$ 10<sup>-6</sup>cm/dyne. Price: £69.95 (plus £16.25 PT).

#### ADC 26

Stereo cartridge. Induced magnet. Sensitivity 4mV at 5.5cm/sec. Separation: 30dB, 50Hz-15kHz. FR 10Hz-22kHz $\pm$ 2dB. Vertical tracking angle 15°. Pw  $\frac{1}{2}$ -1 $\frac{1}{2}$ gm. Cartridge weight: 8.3gm. Stylus: 0.3 $\times$ 0.7thou. Compliance: 50 $\times$ 10<sup>-6</sup>cm/dyne. Price: £49.95 (plus £11.60 PT).

#### ADC 27

Stereo cartridge. Induced magnet. Sensitivity 4mV at 5.5cm/sec. Separation: 30dB, 50Hz-15kHz. FR 10Hz-22kHz $\pm$ 2dB. Vertical tracking angle 15°. Pw  $\frac{1}{2}$ -1 $\frac{1}{2}$ gm. Cartridge weight: 8.3gm. Stylus: 0.3 $\times$ 0.7 thou. Compliance: 40 $\times$ 10<sup>-6</sup>cm/dyne. Price: £39.95 (plus £9.28 PT).

#### ADC 10E

Stereo cartridge. Induced magnet. Sensitivity 4mV at 5.5cm/sec. Separation: 30dB from 50Hz-15kHz. FR 10Hz-20kHz $\pm$ 2dB. Vertical tracking angle 15°. Pw  $\frac{1}{2}$ -1 $\frac{1}{2}$ gm. Stylus: 0.3 $\times$ 0.7 thou. Compliance: 35 $\times$ 10<sup>-6</sup>cm/dyne. Price: £29.95 (plus £6.96 PT).

#### ADC 990XE

Stereo cartridge. Induced magnet. Sensitivity 5mV at 5.5cm/sec. Separation: 20dB, 50Hz-10kHz. FR 10Hz-20kHz $\pm$ 3dB. Vertical tracking angle 15°. Pw 1-3gm. Cartridge weight: 8.0 gm. Stylus: 0.3 $\times$ 0.7 thou. Compliance: 25 $\times$ 10<sup>-6</sup>cm/dyne. Price: £11.95 (plus £2.78 PT).

#### ADC 660XE ★

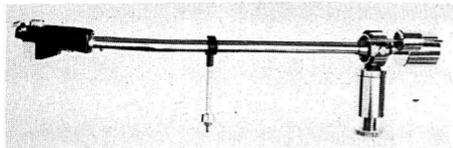
Stereo cartridge. Induced magnet. Sensitivity 5mV at 5.5cm/sec. Separation: 25dB, 50Hz-12kHz. FR 10Hz-20kHz $\pm$ 2dB. Vertical tracking angle 15°. Pw  $\frac{3}{4}$ -2 $\frac{1}{2}$ gm. Cartridge weight: 8gm. Stylus: 0.3 $\times$ 0.7 thou. Compliance: 30 $\times$ 10<sup>-6</sup>cm/dyne. Price: £13.95 (plus £3.24 PT).

#### ADC 550XE

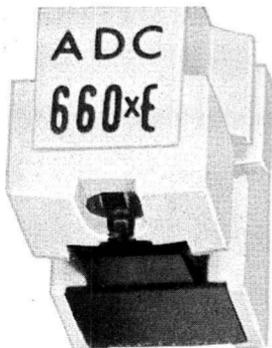
Stereo cartridge. Induced magnet. Sensitivity 5mV at 5.5cm/sec. Separation: 25dB, 50Hz-12kHz. FR 10Hz-20kHz $\pm$ 2dB. Vertical tracking angle 15°. Pw  $\frac{3}{4}$ -2 $\frac{1}{2}$ gm. Cartridge weight: 8.0gm. Stylus: 0.3 $\times$ 0.7 thou. Compliance: 35 $\times$ 10<sup>-6</sup>cm/dyne. Price: £14.95 (plus £3.47 PT).

#### ADC 220XE

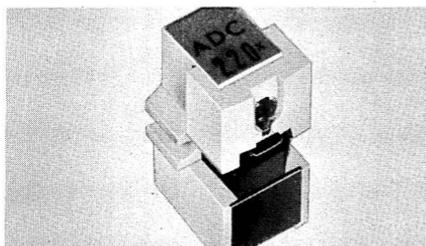
Stereo cartridge. Induced magnet. Sensitivity 6.0mV at 5.5cm/dyne. Separation: 20dB, 50Hz-10kHz. FR 10Hz-18kHz $\pm$ 3dB. Vertical tracking angle 15°. Pw 1 $\frac{1}{2}$ -3gm. Stylus: 0.3 $\times$ 0.7thou. Compliance: 20 $\times$ 10<sup>-6</sup>cm/dyne. Price: £8.95 (plus £2.08 PT).



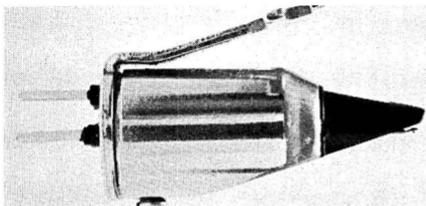
Audio Developments AD309K



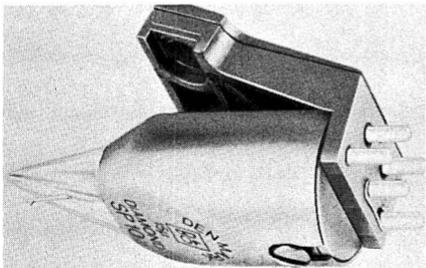
ADC 660XE



ADC 220X



Bang & Olufsen SP6



Bang & Olufsen SP10

**ADC 220X ★**

Stereo cartridge. Induced magnet. Sensitivity 6·0mV at 5·5cm/sec. Separation: 20dB, 50Hz-10kHz. FR 10Hz-18kHz±3dB. Vertical tracking angle 15°. Pw 1½-3gm. Cartridge weight: 8·0gm. Stylus: 0·7 thou. Compliance: 20×10<sup>-6</sup> cm/dyne. Price: £5·50 (plus £1·28 PT).

■ **AUDIO TECHNICA**

Distributors: Shiro (UK) Ltd,  
42 Russell Square, London WC1B 5DF.  
Tel: 01-580 6996.

**AT21**

Stereo magnetic cartridge. Stylus: 0·7 thou (compatible) or 0·5 thou (stereo only). Also available with 0·7×0·3 elliptical stylus. All diamond. Pw: (0·7 and 0·5) 1·2gm, (elliptical) ½-2gm. Effective tip mass: 0·6mg. Compliance: 30×10<sup>-6</sup>cm/dyne. FR: 20Hz-25kHz±2dB. Channel separation: 31dB at 1kHz. Output: 1·6mV/cm/sec. Price: (0·7 and 0·5 thou stylus) £9·50 (plus £2·17 PT); (elliptical) £14·71 (plus £3·37 PT).

**AT66**

Stereo magnetic cartridge. Stylus: (diamond) 0·5, 0·7, 2·5 or elliptical. Pw: 1·2-5gm. Effective tip mass: 0·6mg. Compliance: 30×10<sup>-6</sup>cm/dyne. FR: 20Hz-20kHz±2dB. Channel separation: better than 25dB at 1kHz. Output: 1mV/cm/sec. Price: (0·5, 0·7 and 2·5 thou stylus) £5·45 (plus £1·30 PT); (elliptical) £13·71 (plus £3·17 PT).

**AT1005 Mk II**

Tubular counter-balanced pickup arm. Length 12¾in. Effective length: 9½in. Bias compensation. Calibrated weight adjustment. Hydraulic lift and lowering. Tracking error: <1·5 deg. Price: £16·25 (plus £3·71 PT).

■ **BANG & OLUFSEN UK LTD**

Eastbrook Road, Gloucester, GL47DE.  
Tel: Gloucester 21591.

**SP6, SP7, SP8, SP9 ★**

Stereo cartridges. Moving iron. Pw 1·5-2gm. Tip mass 1·5mg. Compliance 12-15×10<sup>-6</sup>cm/dyne. FR 20Hz-20kHz±2·5dB. Separation approx 20dB at 1kHz. Output: 7mV per channel at 5cm/sec. Rec. load 47K. Diamond 0·6 thou stylus. Fully shielded. Stylus protected against damage if arm dropped on record. SP6 for standard ½in fixing centres. SP7 plug-in fitting for B & O arms. SP8 and SP9 similar to SP6 and SP7 respectively but with elliptical 0·7×0·2 thou stylus and gold plated. Price: SP6 and SP7 £8·90 (including PT); SP8 and SP9 £13·90 (including PT).

**SP10, SP12 ★**

Stereo cartridges. Standard ½in centres. Moving

★ Indicates entry is illustrated

iron. Pw 1-1.5gm. Compliance:  $25 \times 10^{-6}$ cm/dyne. FR 15Hz-25kHz  $\pm 3$ dB. Separation:  $> 25$  dB at 1kHz. Output: 5mV per channel (1mV/cm/sec). Rec. load 47K. Effective tip mass  $< 1$  mg. SP10: 0.6 thou diamond. SP12: 0.7  $\times$  0.2 thou diamond (interchangeable). Price: SP10 £10.90 (including PT); SP12 £16.40 (including PT).

#### SP10A, SP12A

Plug-in versions of the SP10 and SP12, for use with Beogram 1800. Price: (SP10A) £10.90 (including PT); SP12A £16.40 (including PT).

#### SP14, SP14A

Identical to SP10 and SP10A respectively except for compliance which is  $15 \times 10^{-6}$ cm/dyne. Price to be announced.

#### ST/L

Pickup arm. Price: (with SP7 cartridge) £18.90 (including PT).

#### Pickup lift for ST/L arm

Gives hydraulically controlled lowering. Price: £4.50 (including PT).

#### GF2, GF3 Pre-amplifiers for above

See Pickup Accessories section.

### ■ BURNE-JONES & COMPANY LTD

18 Brunswick Road, Sutton, Surrey.

#### B.J. Tan/II arm

Designed to overcome tracking error. Total tracking error less than  $\frac{1}{2}$  degree. Height adjustable. Price: £2.10.

#### B.J. Super 90 Mk II pickup arm

Two models. 12in and 16in. Price (including plug-in shell to carry standard cartridges) £8.40.

### ■ CONNOISSEUR

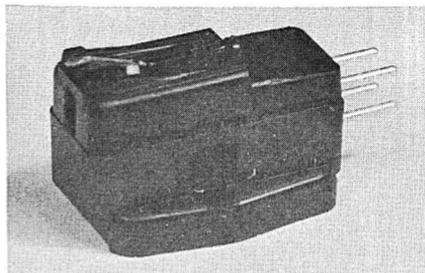
A. R. Sugden & Co (Engineering) Ltd,  
Market Street, Brighouse, Yorkshire.  
Tel: Brighouse 2142. Cables: Connoisseur,  
Brighouse.

#### SCUI ★

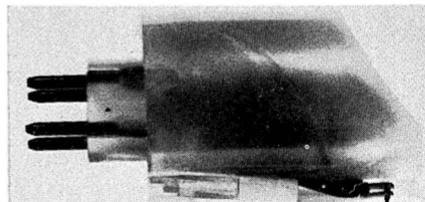
Stereo ceramic cartridge with  $\frac{1}{2}$ in fixing centres. Stylus diamond 0.5-0.6 thou or 1 thou for mono. Pw 2-4gm. Tip mass 1mg. Compliance: lateral  $12 \times 10^{-6}$ cm/dyne; vertical  $8 \times 10^{-6}$ cm/dyne. Range: 25Hz-18kHz  $\pm 3$ dB. Separation (1kHz) 25-30dB; (10kHz) 18dB. Output with rec. load of 100K, 50mV per channel, RIAA equalisation required. Output with 2 megohm load, 150mV per channel, no equalisation required. Features: Four-terminal output, easily replaceable diamond stylus. Price: £5 (plus £1.18 PT).

#### SAU2

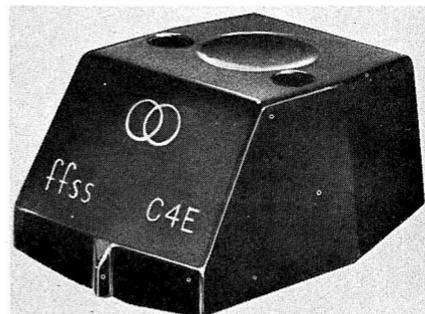
Pickup arm with gimbals mountings on ball bearings set at 45/45. Automatic bias compensator. Hydraulic lowering device. Decoupled counter-balance weight. Additional weight supplied to



Connoisseur SCUI



Decca Deram



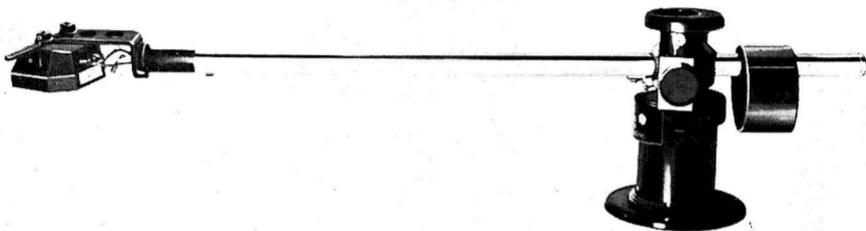
Decca C4E

accommodate different cartridges. Single hole fixing. Height adjustable from 1in to 2in. Lightweight shell with  $\frac{1}{2}$ in fixing centres. Five-pin plug connection to base of pickup. Low resistance self-cleaning contacts. New head shell allows backward-forward horizontal adjustment so that minimum tracking error is obtainable with all cartridges. Alignment protractor provided. Supplied with set of leads and separate precision balance with range 0-6gm. Price: £12 (plus £2.82 PT). Extension stem for use with high turntables: 35p.

### ■ COSMOCORD See Acos

### ■ DECCA

Decca Special Products, Ingate Place,  
Queenstown Road, London, S.W.8.  
Tel: 01-622 6677.



### Decca International Arm

#### Deram ceramic ★

Stereo/mono cartridge. White shell transcription quality. Pw 2.5gm. Tip mass 0.6mg. Compliance:  $9 \times 10^{-6}$  lateral,  $5 \times 10^{-6}$  vertical. FR 18Hz-18kHz  $\pm 3$ dB. Separation better than -20 dB at 1kHz. Output: 35mV per channel. Rec. load impedance 2 megohms. Stylus 0.5-0.6 thou diamond. Price: £4.25 (plus £1 PT).

#### NOTE

All Deram cartridges are of transcription quality, the black shell range intended primarily for cheaper auto-changers is discontinued.

#### Deram ceramic

Mono cartridge. Stylus 1 thou diamond. All other details as for stereo/mono cartridge. Price: £4.25 (plus £1 PT).

#### ffss Mk II head

Variable reluctance stereo/mono head. FR 40 Hz-16kHz. Separation -20dB at 1kHz, -15dB at 50Hz and 12kHz. Output 1.2mV/cm/sec per channel. Stylus 0.5 thou diamond. Pw 3.5gm. Tip mass less than 1mg. Compliance  $10 \times 10^{-6}$  lateral,  $2 \times 10^{-6}$  vertical. Rec. load 50K. Price: £12.95 (plus £3.05 PT).

#### ffss Mk 4 cartridge C4E ★

Stereo/mono cartridge. FR 20Hz-20kHz (20Hz-16kHz  $\pm 2$ dB). Separation as for Mk II. Output: 5mV at 5cm/sec per channel. Stylus  $0.3 \times 0.65$  thou elliptical diamond. Pw 1.2½gm. Compliance  $30 \times 10^{-6}$  lateral,  $6 \times 10^{-6}$  vertical. Rec. load 50K. Output from each channel balanced within 1dB. Price: £18.21 (plus £4.29 PT).

#### ffss Mk 4 cartridge SC4E

Stereo/mono cartridge. FR 20Hz-20kHz  $\pm 2$ dB. Separation as for Mk III. Output: 5mV at 5cm/sec per channel. Stylus  $0.3 \times 0.65$  thou elliptical diamond. Pw 1.2½gm. Compliance  $30 \times 10^{-6}$  lateral,  $6 \times 10^{-6}$  vertical. Rec. load 50K. Output from each channel balanced within 1dB. Available to special order only. Price: £28.34 (plus £6.66 PT).

#### ffss Mk 4 cartridge 4RC

Stereo magnetic head. Diamond stylus 0.5/6

thou. Pw 3.5gm. Tip mass less than 1 milligram. Compliance:  $15 \times 10^{-6}$ cm/dyne lateral,  $4 \times 10^{-6}$  cm/dyne vertical. FR 30Hz-20kHz (30Hz-16 kHz  $\pm 3$ dB). Separation: better than 20dB. Output: 1.5mV at 1cm/sec at 1kHz. Rec. load 47K. Price: £13.76 (plus £3.24 PT).

#### ffss Mono 78

Variable reluctance 78 equivalent of Mk II stereo/mono head. Stylus 2.8 thou diamond. Price: £8.50 (plus £2 PT). Available to special order only.

#### ffss Mk 4 cartridge 78C

Mono magnetic cartridge. Diamond stylus 2.8 thou. Pw 3.5gm. Tip mass less than 1 milligram. Compliance:  $15 \times 10^{-6}$ cm/dyne lateral. FR 30 Hz-16kHz  $\pm 3$ dB. Output: 1.5mV cm/sec. Rec. load 47K. Available to special order only. Price: £8.50 (plus £2 PT).

#### ffss 'International' Arm ★

Stereo pickup arm. Jewelled uni-pivot. Pw ½-3½ gm. Constantly variable magnetic bias compensation. Suspended on magnetic cushion. Provision for damping lateral and vertical resonances. Price: £21.45 (plus £5.05 PT).

#### NOTES

Decca maintains that head and arm should be designed as an entity for optimum results. For this reason Decca ffss arms and heads have an exclusive head fitting, which also ensures accurate alignment. All ffss heads will fit all ffss arms, but heads with elliptical stylus should be used only with 'Professional' arms, or arms reaching the 'Super' specification.

Deram heads are suitable for use with amplifiers having a sensitivity of 100mV.

Diamond styli for all Deram pickup heads, including 78 heads, are £1.50 each including PT. Replacement Deram elliptical styli are now available at £2.50 each inc. PT.

Decca ffss pickup heads can be inspected for a charge of 63p. When the stylus is worn on a Decca ffss head it must be returned to the maker for replacement. The service offered is complete

★ Indicates entry is illustrated

replacement of the head with a reconditioned head having a new stylus. Performance is guaranteed to be as new. Prices for this service are as follows: Mk III elliptical styli £7. Mk I and II spherical styli £5-50. Mono LP and 78 styli £5. Mk 4 H4E and C4E elliptical styli £7-50. Mk 4 SH4E and SC4E elliptical styli £10. Mk 4 78C spherical styli £5. All prices include PT.

Mk I *ffss* heads are no longer in production.

#### ■ EAGLE INTERNATIONAL

Heather Park Drive, Wembley, HAI 1SU.

Tel: 01-903 0144.

#### LC05

Stereo cartridge. Moving magnet. FR 30Hz-18 kHz. Compliance:  $9 \times 10^{-6}$ cm/dyne. Separation: 20dB at 1kHz. Output: 6mV per channel. Rec. load 47K. Price: £4 (plus 99p PT).

#### LC07 ★

Stereo cartridge. Moving magnet. LP and stereo. FR 20Hz-21kHz. Compliance:  $12 \times 10^{-6}$ cm/dyne. Separation: 28dB at 1kHz. Output: 7mV per channel. Rec. load 47K. Price: £5-60 (plus £1-39 PT).

#### ■ EMPIRE SCIENTIFIC

Empire Scientific Corporation, U.S.A.

Distributors: Rank Audio Visual Ltd,

PO Box 70, Great West Road,  
Brentford, Middlesex.

Tel: 01-568 9222. Telex: 24408.

#### 90EE/X

Stereo magnetic cartridge. Elliptical diamond stylus,  $0.4 \times 0.7$  thou. Pw:  $1\frac{1}{2}$ -4gm. Compliance:  $15 \times 10^{-6}$ cm/dyne. FR 15Hz-25kHz. Separation: 30dB. Output: 8mV. Price: £8 (plus £1-91 PT).

#### 909/X ★

Stereo magnetic cartridge. Spherical diamond stylus, 0.7 thou. Pw: 1-4gm. Compliance:  $15 \times 10^{-6}$ cm/dyne. FR 15Hz-25kHz. Separation: 30dB. Output: 8mV. Price: £7-75 (plus £1-85 PT).

#### 909E/X

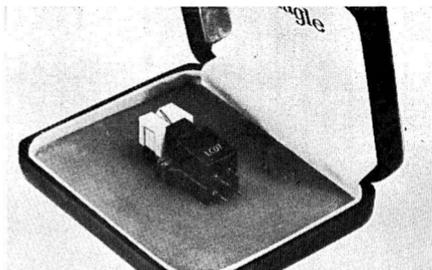
Stereo magnetic cartridge. Elliptical diamond stylus,  $0.4 \times 0.7$  thou. Compliance:  $15 \times 10^{-6}$ cm/dyne. FR 12Hz-25kHz. Separation: 30dB. Output: 8mV. Price: £10-35 (plus £2-47 PT).

#### 999/X ★

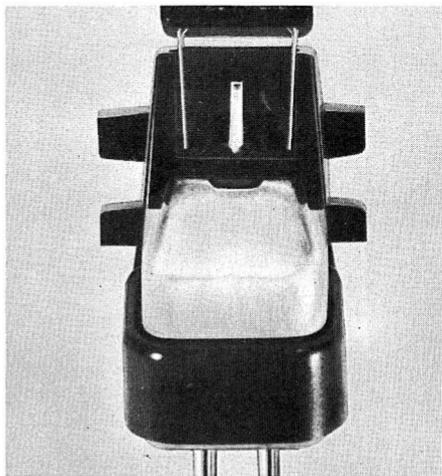
Stereo magnetic cartridge. Spherical diamond stylus, 0.7 thou. Pw:  $\frac{3}{2}$ -2gm. Compliance:  $20 \times 10^{-6}$ cm/dyne. FR 10Hz-30kHz. Separation: 35dB. Output: 8mV. Price: £10-50 (plus £2-50 PT).

#### 999E/X

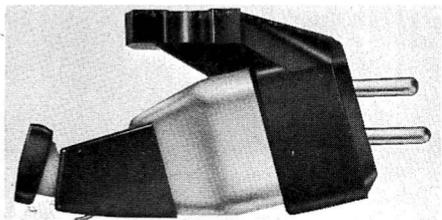
Stereo magnetic cartridge. Elliptical diamond stylus,  $0.3 \times 0.7$  thou. Pw:  $\frac{3}{2}$ -2gm. Compliance:



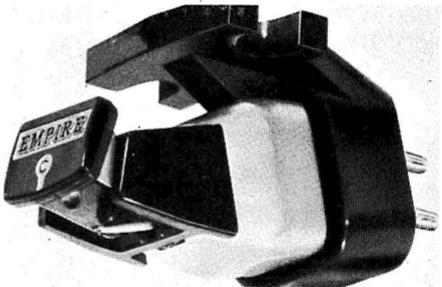
Eagle LC07



Empire 909/X



Empire 999/X



Empire 999VE

25 × 10<sup>-6</sup>cm/dyne. FR 10Hz-30kHz. Separation: 35dB. Output: 8mV. Price: £13.30 (plus £3.17 PT).

#### 999SE/X

Stereo magnetic cartridge. Elliptical diamond stylus, 0.2 × 0.7 thou. Pw: ½-1½gm. Compliance: 30 × 10<sup>-6</sup>cm/dyne. FR: 8Hz-32kHz. Separation: 35dB. Output: 8mV. Price: £17 (plus £4.05 PT).

#### 999TE/X

Stereo magnetic cartridge. Elliptical diamond stylus, 0.2 × 0.7 thou. Pw: ½-1½gm. Compliance: 30 × 10<sup>-6</sup>cm/dyne. FR 6Hz-32kHz. Separation: 35dB. Output: 6mV. Price: £21 (plus £5 PT).

#### 999VE ★

Stereo magnetic cartridge. Hand-polished diamond stylus. Tip: 0.2 × 0.7 thou. Pw: ½-1½gm. Compliance: 35 × 10<sup>-6</sup>cm/dyne. FR 6Hz-36kHz. Separation: 35dB. Output: 6mV. Price: £36 (plus £8.58 PT).

#### 1000ZE/X

Stereo magnetic cartridge. Hand-polished diamond stylus. Tip: 0.2 × 0.7 thou. Pw: ½-1½gm. Compliance: 35 × 10<sup>-6</sup>cm/dyne. FR 4Hz-40kHz. Separation: 35dB at 1kHz, 25dB at 20kHz. Output: 5mV per channel. Price: £50.50 (plus £12.03 PT).

### ■ EUPHONICS

Distributors: Farnell-Tandberg Ltd, 81 Kirkstall Road, Leeds, 3. Tel: Leeds 35111.

#### Miniconic

Semiconductor stereo cartridge. Crystalline silicon element treated so that changing pressures produced by stylus vary the resistance. FR 20Hz-20kHz ±2dB. Pw 0.5gm. Tracks up to 40kHz. Stylus 0.2 × 0.7 elliptical diamond. Compliance 25 × 10<sup>-6</sup>cm/dyne horizontal and vertical. Output dependent on setting of power supply unit and adjustable between 8mV at 47K to 400mV at 500K. Also supplies 100mV at 600 ohms. Must have external power source which may be from a separate unit or derived from associated equipment. Price: U15-LS cartridge £26.56 (including PT); U15-P cartridge £15.56 (including PT); TA15 pickup arm £22.85 (including PT).

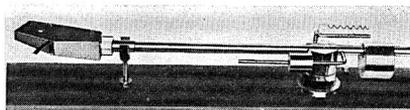
#### Miniconic PS-15F Power Supply

Supplies 6mA polarising current to each element at 14V DC. Inverts phase of one element to provide normal in-phase output signals. Matches impedance and levels to suit any type of pre-amplifier input. Price: £9.45.

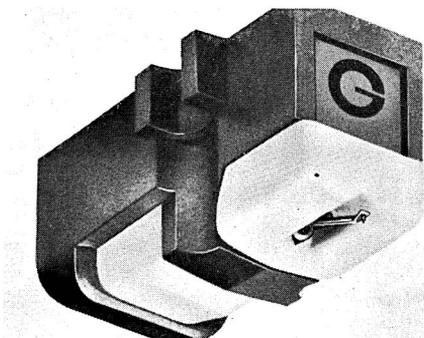
### ■ EXPERT PICKUPS LTD

PO Box No: 3, Ashstead, Surrey.  
Tel: Ashstead 73704.

See entry in Pickup Accessories Section.



Goldring L75 pickup arm



Goldring 800

### ■ GOLDRING MANUFACTURING CO (Great Britain) LTD

10 Bayford Street, London, E8 3SE.  
Tel: 01-985 1152.

#### Goldring/Lenco L75 ★

Transcription pickup arm. Calibrated stylus pressure adjustment. Removable plug-in shell with adjustable stylus position. Anti-skating bias compensator. Price: £11 (plus £2.62 PT).

#### Goldring/Lenco L69

Pickup arm. Stereo. Low mass tubular arm. Removable plug-in shell with stylus position adjustment. Sliding counterweight stylus pressure adjustment, height adjustment. Price: £8 (plus £1.91 PT).

#### CS90

Stereo ceramic cartridge. Stylus 0.5 or 0.7 thou diamond. Pw 2gm. Compliance 8 × 10<sup>-6</sup>cm/dyne. FR 30Hz-18kHz. Separation: 25dB at 1kHz, 10dB at 10kHz. Output: 50mV. Rec. load 1-2 megohms. Price: £4.20 (plus £1 PT).

#### CS91E

Stereo/LP ceramic cartridge. Stylus: elliptical diamond. Pw 1½-3gm. Tip mass 1mg. FR 20Hz-20kHz. Separation 25dB. Output: 20mV. Rec. load 2 megohms. Price: £6.30 (plus £1.50 PT).

#### '800' ★

Stereo magnetic cartridge. Stylus 0.5 thou diamond. Pw 1-3gm. Tip mass less than 1mg. Compliance 20 × 10<sup>-6</sup>cm/dyne. FR 20Hz-20kHz ±3dB. Separation 20dB at 1kHz, 15dB at 10kHz. Output: 1mV. Rec. load 47K. Price: £10.50 (plus £2.50 PT).

★ Indicates entry is illustrated

### **G800E**

Stereo magnetic cartridge. Stylus:  $0.3 \times 0.8$  thou diamond. Pw  $\frac{1}{2}$ - $1\frac{1}{2}$ gm. Tip mass: less than 1mg. Compliance  $30 \times 10^{-6}$ cm/dyne lateral and vertical. FR 10Hz-25kHz. Separation: 25dB at 1kHz, 15dB at 10kHz. Output: 1mV. Rec. load 47K-100K. Price: £15.20 (plus £3.62 PT).

### **G800E Super E ★**

Stereo magnetic cartridge. Single-sided with elliptical diamond,  $0.3 \times 0.8$  thou replaceable. Pw  $\frac{1}{2}$ - $1\frac{1}{2}$ gm. Tip mass less than 1mg. Compliance  $35 \times 10^{-6}$ . FR 10Hz-23kHz. Channel separation 25dB (1kHz) and better than 15dB (10kHz). Output voltage 0.8mV. Rec. load 47K. Price: £21 (plus £5 PT).

### **Goldring G800/H**

Magnetic stereo cartridge. Single-sided with  $0.7$  thou tip radius diamond. Replaceable. Pw  $2\frac{1}{2}$ - $3\frac{1}{2}$ gm. Tip mass 1.2mg. Compliance  $18 \times 10^{-6}$ . FR 20Hz-20kHz. Separation 20dB at 1kHz, 10dB at 10kHz. Output: 1.6mV. Rec. load 47K. Price: £8.60 (plus £2.05 PT).

### **Goldring 850 ★**

Magnetic stereo cartridge. Single-sided,  $\frac{1}{2}$ in fixing centres. Stylus:  $0.7$  thou diamond, replaceable. Pw  $2.3\frac{1}{2}$ gm. FR 20Hz-18kHz. Separation 20dB at 1kHz. Output: 1.6mV. Rec. load 47K-100K. Price: £5.25 (plus £1.25 PT).

## **■ GROSVENOR**

Kelgrove (Sales) Ltd, 25-31 Roman Road, London, E2. Tel: 01-980 7494/1936.

### **MC1-5**

Stereo magnetic cartridge. Stylus:  $0.7$  thou diamond. Pw: 3-5gm. Compliance:  $8 \times 10^{-6}$ cm/dyne. FR: 15Hz-20kHz. Output: 5mV at 1kHz at 5cm/sec. Balance: 1dB at 1kHz. Separation: better than 25dB at 1kHz. Impedance: 2.2K at 1kHz. Rec. load: 50-100K. Tracking angle:  $15^\circ$ . Cartridge weight: 6.5gm. Standard  $\frac{1}{2}$ in centre mounting. Price: £6.20 (including PT).

### **SMC-101**

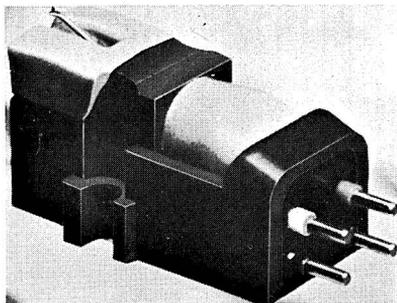
Stereo magnetic cartridge. Stylus:  $0.7$  thou diamond. Pw: 3-5gm. Compliance:  $8 \times 10^{-6}$ cm/dyne. FR: 20Hz-20kHz. Output: 5mV at 1kHz at 5cm/sec. Balance: 1dB at 1kHz. Separation: better than 25dB at 1kHz. Impedance: 2.5K at 1kHz. Rec. load: 50-100K. Cartridge weight: 9gm. Standard  $\frac{1}{2}$ in centre mounting. Price: £4.95 (including PT).

## **■ G. F. C. HADCOCK**

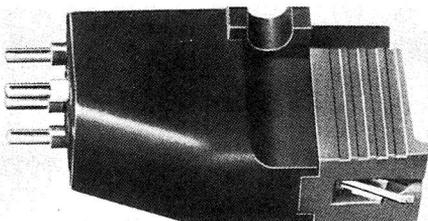
Audio Division, The Old Vicarage, Doveridge, Derby, DE65NN. Tel: Uttoxeter 2452.

### **GH Unipoise ★**

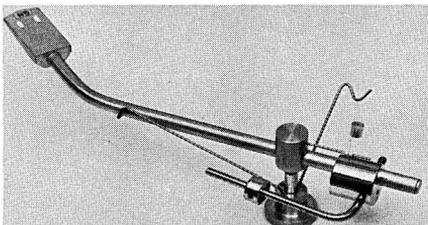
Featuring a new bearing assembly offering friction of less than 6mg at the pivot. Finely



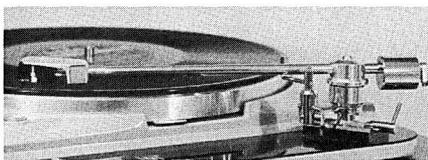
*Goldring G800/E Super E*



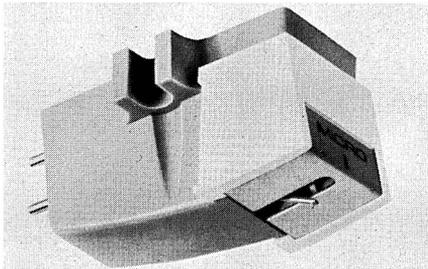
*Goldring 850*



*GH Unipoise*

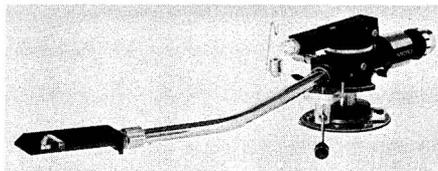


*Keith Monks Laboratory 9*



*Micro-Seiki M2100/E*

engineered tubular aluminium arm with slotted headshell. Accepts all lightweight cartridges down to 0.5gm. Standard  $\frac{1}{2}$ in fixing centres. Easy operation due to simplicity of unipivot design. Bias compensation assembly included. Easily adjusted calibrated weight 0.3gm. GH Unilift lowering device available separately (see pickup accessories section). Size: Length  $12\frac{1}{2}$ in, height  $2\frac{1}{4}$ in, pivot to stylus tip  $9\frac{1}{2}$ in, pivot to centre of turntable  $8\frac{3}{8}$ in. Offset angle  $23^\circ$ . Rear overhang 3in. Price: £13.60 (plus £3.20 PT).



Micro-Seiki MA100

■ **KEITH MONKS (Audio) LTD**  
5 Fleet Road, Fleet, Aldershot, Hants.  
Tel: Fleet 7316.

#### Laboratory 9 ★

9in pickup arm designed for low-mass ultra-high compliant cartridges tracking at very low stylus pressures. Damped unipivot arm with no lead-out wires. Bias correction and lifting device incorporated. Lathe base all fully adjustable by finger locking levers. Price: £25 (plus £6.13 PT).

#### ■ MICRO-SEIKI

Distributors: B. H. Morris & Co (Radio) Ltd,  
84-88 Nelson Street, London, E1 2DY.  
Tel: 01-790 4824.

#### MA-77 MK-11 (SR)

Static balance S-shape arm. Total length  $13\frac{3}{8}$ in, effective length  $9\frac{3}{8}$ in. Split revolving counterweight with spare sub-weight for 2-18gm cartridges. Direct-reading scale ring for playing weight adjustment 0-6gm. Spring anti-skate device with adjustable cancel force (0.0-33gm) to eliminate bias. Oil-damped arm lifter. Price: £25 (including PT).

#### MA-100 ★

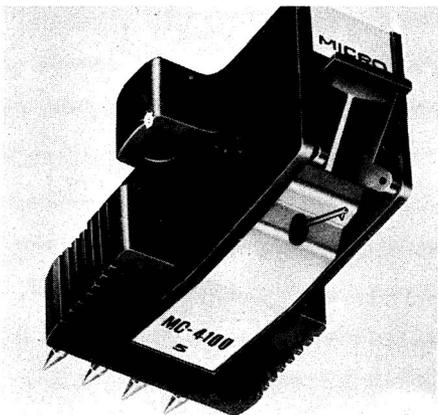
Dynamic balance arm. Total length  $15\frac{1}{2}$ in, effective length  $11\frac{1}{2}$ in. Stylus pressure adjustment in 0.1gm steps. Versatile setting mechanism combines oil-damped lifter, arm rest and arm guide. Anti-skate device with special cam and variable bias gauge. Revolving counterweight adjuster and two sub-weights for 3-23gm cartridges. Unique arm height adjustment. De luxe base. Price: £75 (including PT).

#### MA-101

Static balance S-shape arm. Total length 15in, effective length  $10\frac{1}{2}$ in. Split revolving counterweight for 5-24gm cartridges. Direct-reading scale ring. Spring anti-skate device with special cam and variable bias force (0-6gm). Oil-damped arm lifter. De luxe base with Teflon 'stopper,' three lateral adjustment screws and temporary rest to protect bearings. Price: £34 (including PT).

#### MC-4100 ★

Moving-coil stereo cartridge. Suffix /E indicates



Micro-Seiki MC-4100/5

0.3 × 0.8 thou stylus; /5 has 0.5 thou round diamond stylus. FR (-0.5, +2.5dB): 20Hz-20kHz. Separation: 33dB. Compliance:  $25 \times 10^{-6}$ cm/dyne. Tracking force: 1.5gm. Output: 0.1mV (3.45cm/sec). Price: (MC-4100/E) £21 (including PT); (MC-4100/5) £17.50 (including PT).

#### VF-3100 E11

Variable flux stereo cartridge. /E-11 elliptical, /5-11 round stylus. FR: as above. Sep: 30dB. Compliance:  $20 \times 10^{-6}$ cm/dyne. Tracking force: 2gm. Output: 3mV. Price: £13.50 (including PT).

#### M-2100 ★

Super Micro Trace stereo cartridge. /E indicates elliptical, /5 has round stylus. FR: 10Hz-30kHz (25kHz for /5). Sep: 30dB. Compliance:  $28 \times 10^{-6}$ cm/dyne. Tracking force: 1.5gm. Output: 4mV. Price: (M-2100/E) £11 (including PT); (M-2100/5) £7 (including PT).

#### VF-3100/5

Variable flux stereo cartridge. FR: 5Hz-30kHz Sep: 30dB. Compliance:  $20 \times 10^{-6}$ cm/dyne. Tracking force: 2gm. Output: 4mV. Price: £10 (including PT).

#### M-2100/6

Micro Trace stereo cartridge. 0.6 thou round stylus. FR: 10Hz-28kHz. Sep: 28dB. Compliance:  $23 \times 10^{-6}$ cm/dyne. Tracking force: 2gm. Output: 6mV. Price: £5.75 (including PT).

★ Indicates entry is illustrated

## ■ NEAT CORPORATION

Distributors: Howland-West Ltd, 2 Park End, South Hill Park, London, N.W.3.  
Tel: 01-794 6666 and 6033.

### G30 ★

Transcription arm and shell. Wired for mono or stereo. Easy mounting. Accommodates all standard cartridges. Adjustable tracking weight. Supplied with aluminium head shell, pickup rest, pressure gauge and plug-in leads with phono plugs. Vertical balance by miniature ball bearings, horizontal balance by jewelled pivots. Decoupled balance weight at rear of arm provides coarse adjustment of playing weight, rider weight at side of arm provides fine adjustment. Screw collar permits height adjustment. Pivot to stylus 9 $\frac{3}{4}$ in. Arm length 13in. Leads 56in. Height (adjustable) 1 $\frac{3}{4}$ -3 $\frac{1}{4}$ in. Mounting hole  $\frac{1}{2}$ in dia. Cartridge fixing  $\frac{1}{2}$ in centres. Price: £11 (plus £2.55 PT).

### Lift

Optional oil lift for G30 arm. Price: £3 (plus 70p PT).

### G30B

Same as G30 but with bias adjuster. Price: £13 (plus £3.02 PT).

### V60MH ★

Stereo cartridge. Magnetic. Sensitivity 3.5mV 1kHz at 5cm/sec. Separation 30dB 1kHz. FR 20Hz-20kHz. Rec. load 30-100K. Rec. playing weight 1-3gm. Compliance  $15 \times 10^{-5}$ cm/dyne. Stylus, diamond, spherical. Price: £7 (plus £1.62 PT).

### V60MHE

Stereo cartridge. Magnetic. Sensitivity 3.5mV 1kHz at 5cm/sec. Separation 30dB 1 kHz. FR 15Hz-20kHz. Rec. load 30-100K. Rec. playing weight 1-3gm. Compliance  $15 \times 10^{-5}$ cm/dyne. Stylus, diamond, elliptical. Price: £9.50 (plus £2.20 PT).

### V70

Magnetic stereo cartridge. Stylus 0.5 thou diamond. Pw 1 $\frac{1}{2}$ -3gm. Separation 30dB at 1kHz. Rec. load 50K. Output: 5mV at 100Hz 5cm/sec. Price: £4.25 (plus 98p PT).

### V70E

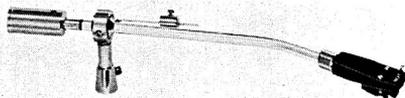
Stereo magnetic cartridge. Elliptical diamond 0.2 x 0.7 thou. Pw 1.5-3gm. Compliance  $5 \times 10^{-6}$ . FR 18Hz-22kHz. Channel separation 30dB at 1kHz. Output voltage: 5mV. Load impedance: 50K. Price: £6.30 (plus £1.46 PT).

## ■ ORBIT

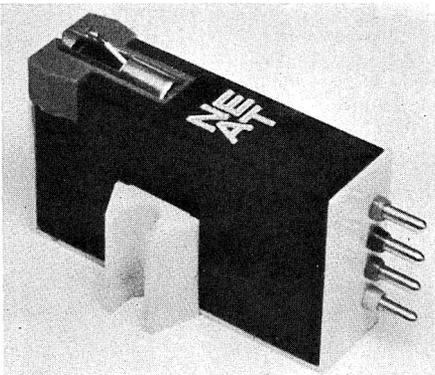
Distributors: Highgate Acoustics, 184-188 Great Portland Street, London, W.1.  
Tel: 01-636 2901.

### NM22

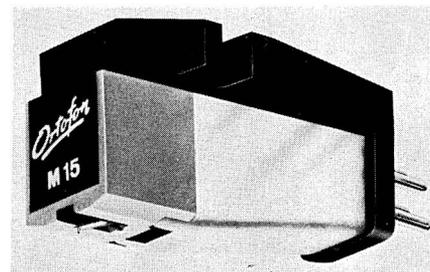
Magnetic stereo cartridge with diamond stylus.



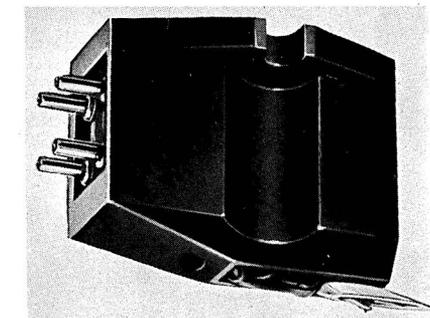
Neat G30



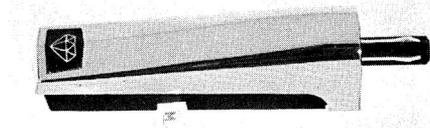
Neat V60MH



Ortofon M15



Ortofon SL 15/E



Philips GP200

FR 20Hz-20kHz. Channel separation 20dB at 1kHz. Output: 5mV. Load: 50K-100K. Playing weight: 2-3gm. Price: £4.75 (including PT). Replacement diamond stylus: £3 (including PT).

### ■ ORTOFON

Distributed in the UK by Metrosound (Sales) Co Ltd, Cartersfield Road, Waltham Abbey, Essex.

Tel: Waltham Cross 31933.

#### Type C (without shell)

Moving coil head. Diamond stylus. Output voltage LP 0.3mV. Range 20Hz-20kHz linear. Pw 3gm. Load impedance 2 ohms (transformer required). Price: £13.25 (plus £3.12 PT).

#### Type CE

Astype C but with elliptical stylus. Price: £18.25 (plus £4.30 PT).

#### M15 ★

Moving magnet cartridge. Replaceable styli (elliptical or conical). Output at 1kHz 0.9mV/cm/sec  $\pm$  1dB per channel. Load 47K. FR 20Hz-20kHz  $\pm$  2dB. 30dB sep. at 1kHz. Tracking angle 15°. Tip mass 0.4mg. Stylus pressure: min  $\frac{3}{4}$ gm, recommended 1 $\frac{1}{2}$ gm. Price: (M15E elliptical) £24 (plus £5.65 PT); (M15 spherical) £19 (plus £4.47 PT).

#### MF15

As M15 above except stylus pressure: min 1gm, rec. 2gm. Price: (MF15E elliptical) £20 (plus £4.70 PT); (MF15 spherical) £15 (plus £3.53 PT).

#### Replacement styli

For M15 and MF15. Price: (M15E grey) £13 (plus £3.06 PT); (M15 blue) £8 (plus £1.88 PT); (MF15E red) £11 (plus £2.59 PT); (MF15 black) £6 (plus £1.41 PT).

#### Shells

Type M metal shells for 15 Series cartridges. Price: £1.25 (plus 29p PT).

#### SL15/E ★

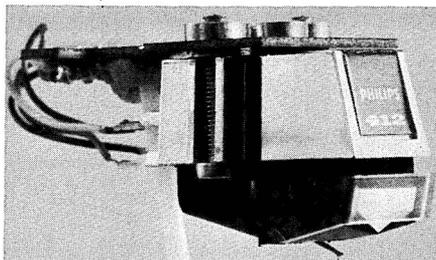
Moving coil stereo cartridge. Pw 1-2gm. Tip mass 0.9mg. Compliance  $25 \times 10^{-6}$ cm/dyne. FR 10Hz-40kHz. Separation 20-30dB. Output 0.04 mV/cm/sec (loaded). Output impedance 2 ohms. Matching transformer required for most amplifiers (see transformer below). Stylus diamond 0.6  $\times$  0.3 thou. Tracking angle 15°. Price: £24 (plus £5.65 PT).

#### SL15

Similar specification to SL15/E but with spherical 0.6 thou diamond stylus. Price: £18.25 (plus £4.30 PT).

#### Transformer module

Primary impedance 2 ohms. Secondary impedance 15K. Load 10K to 50K without change in frequency response. FR 20Hz-40kHz. Price: £7.



Philips GP412

#### RMG/309

16in pick-up arm for stereo and mono cartridges. Playing weight adjustable from 0-12gm. Price: £21 (plus £4.94 PT).

#### RS212

Similar to RMG arm but with the addition of automatic anti-skating device. Length of arm 11.8in. Centre of arm base to turntable centre 8 $\frac{3}{8}$ in. Height adjustable 1 $\frac{3}{8}$ -2 $\frac{3}{8}$ in. Arm base 2in dia. Centre of base to stylus tip 9in. Off-set angle 22-7°. Stylus pressure adjustable 0.4-5gm. Suitable for cartridges weighing 7-19gm. Hi-Jack cueing device built in. Ratio between stylus pressure and anti-skating force is factory adjusted to suit Ortofon cartridge with elliptical stylus. Ratio adjustment screw provided to alter for other cartridges. Price: £25 (plus £5.88 PT).

#### AS212

Specification as for RS212 arm but with new anti-skating device and lightweight shell. Price: £27.50 (plus £6.47 PT).

### ■ PHILIPS ELECTRICAL LTD

Century House, Shaftesbury Avenue, London, WC2. Tel: 01-437 7777.

#### GP200 ★

Plug-in stereo ceramic turnover head. Stylus: diamond 0.7 thou, 78 sapphire 3 thou. Pw: 3-6 gm. Compliance lateral  $2.5 \times 10^{-6}$ , vertical  $1.3 \times 10^{-6}$ . FR: 50Hz-18kHz  $\pm$  3dB. Output voltage 65mV. Rec. load  $\frac{1}{4}$ -1 M. Price: £3.80 (including PT).

#### GP410

Plug-in stereo magneto dynamic head. 45/LP only. Stylus 0.6 thou. Pw 2-4gm. Effective tip mass: 1mg. Compliance lateral  $10 \times 10^{-6}$ , vertical  $8 \times 10^{-6}$ . FR: 30Hz-18kHz  $\pm$  3dB. Channel separation >20dB at 1kHz. >12dB at 10 kHz. Output voltage: 1mV. Rec. load 68K. Price: £11.37 $\frac{1}{2}$  (plus £2.68 PT).

#### GP412 ★

Stereo magneto dynamic cartridge. 45/LP only. Standard  $\frac{1}{2}$ in mounting centres. Stylus: 0.3  $\times$  0.7

★ Indicates entry is illustrated

thou bi-radial diamond. Pw 0.75-1.5gm. Effective tip mass < 0.75mg. Compliance lateral > 20 typical 25; vertical > 15 typical 20. FR: 20 Hz-20kHz  $\pm$  2dB. Channel separation > 25dB at 1kHz, > 16dB at 10kHz. Output: 0.8mV. Rec. load 47K. Price: £31.57½ (plus £7.43 PT).

#### GP400

Stereo magneto dynamic cartridge. ½in fixing centres. Pw: 1.5-3gm. Sensitivity: 1.2µV/cm/sec. Stylus: 15 micron diamond. Compliance: 20mm/N lateral, 16mm/N vertical. Rec. load: 47K. Separation: > 20dB at 1kHz. Dynamic mass: < 0.8mg. FR: 20Hz-20kHz  $\pm$  3dB. Net weight: 7gm. Price: £19.75 (including PT).

#### GP401

Specification as for GP400 but fitted with elliptical stylus 18 micron by 7 micron diamond. Price to be announced.

#### GP213

Stereo ceramic cartridge. ½in fixing centres. Stylus: 18 micron diamond LP, 75 micron sapphire 78° (turnover assembly). Pw: 3-7gm. Sensitivity: 65mV/cm/sec at 1kHz. Compliance: > 5mm/N. Rec. load: 1M. Separation: > 18dB at 1kHz. Net weight: 2.5gm. Price: to be announced.

### ■ PICKERING

Distributors: Highgate Acoustics, 184-188 Great Portland Street, London, W.1. Tel: 01-636 2901.

#### XV-15 DCF Series

With Dustamatic. Stereo magnetic cartridges all with 35dB channel separation. Series comprises the following:

##### 750E

Output 4.4mV. FR 10Hz-25kHz. Pw ½-1gm. Stylus 0.2 × 0.9 thou. Price: £32.17 (plus £6.83 PT).

##### 400E

Output 4.5mV. FR 10Hz-25kHz. Pw ¾-1½gm. Stylus 0.3 × 0.9 thou. Price: £20.62 (plus £4.38 PT).

##### 140E

Output 8mV. FR 10Hz-20kHz. Pw 3-5gm. Stylus 0.4 × 0.9 thou. Price: £17.32 (plus £3.68 PT).

##### 350

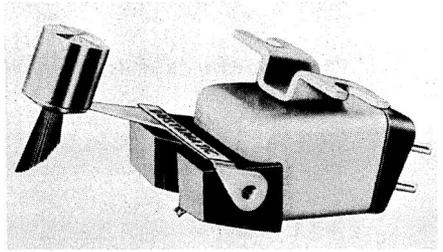
Output 6mV. FR 10Hz-25kHz. Pw 1-3gm. Stylus 0.7 thou spherical. Price: £16.09 (plus £3.41 PT).

##### 150

Output 8mV. FR 10Hz-25kHz. Pw 2-5gm. Stylus 0.7 thou. Price: £14.44 (plus £3.06 PT).

##### 100

Output 8mV. FR 10Hz-20kHz. Pw 3-7gm. Stylus 0.7 thou. Price: £13 (plus £2.75 PT).



Pickering V-15 Series



Shure M3D

### V-15/3 Dustamatic Series ★

With patented 'floating' stylus. This series comprises the following:

#### AME-3

Output 5.5mV. Separation 32dB. FR 10Hz-25 kHz. Pw ¾-1½gm. Stylus 0.3 × 0.9 thou. Price: £17.32 (plus £3.68 PT).

#### ACE-3

Output 7.5mV. Separation 26dB. FR 10Hz-20 kHz. Pw 3-5gm. Stylus 0.4 × 0.9 thou. Price: £12.37 (plus £2.63 PT).

#### AM-3

Output 6.5mV. Separation 32dB. FR 10Hz-23 kHz. Pw 1-3gm. Stylus 0.7 thou spherical. Price: £13 (plus £2.75 PT).

#### AT-3

Output 7.5mV. Separation 32dB. FR 10Hz-23 kHz. Pw 2-5gm. Stylus 0.7 thou. Price: £10.94 (plus £2.31 PT).

#### AC-3

Output 7.5mV. Separation 26dB. FR 10Hz-20 kHz. Pw 3-7gm. Stylus 0.7 thou. Price: £9.90 (plus £2.10 PT).

### ■ SHURE ELECTRONICS LTD

84 Blackfriars Road, London, S.E.1. Tel: 01-928 3424.

#### M3D ★

Stereo Dynetic cartridge. Moving magnet. ½in fixing centres. Stylus 0.7 thou diamond. Pw 3-6 gm. Compliance 4 × 10<sup>-6</sup>cm/dyne. FR 20Hz-

15kHz. Separation 20dB at 1 kHz. Output: 1mV. Load impedance 47K. Price: £6 (plus £1.41 PT).

### M31E

Stereo Dynetic cartridge. Moving magnet.  $\frac{1}{2}$ in fixing centres. Elliptical stylus. Pw 1-2gm. Recommended for the use with transcription automatic changers. Price: £9.75 (plus £2.29 PT).

### M32E

Stereo Dynetic cartridge. Moving magnet.  $\frac{1}{2}$ in fixing centres. Elliptical stylus. Pw  $2\frac{1}{2}$ -5gm. Recommended for use with automatic turntables. Price: £9 (plus £2.12 PT).

### M32-3

Moving magnet cartridge for 78rpm records only. For collectors who wish to own a separate cartridge for this purpose. Price: £8.25 (plus £1.94 PT).

### M44C

Stereo Dynetic cartridge. Moving magnet.  $\frac{1}{2}$ in fixing centres. Stylus 0.7 thou diamond (1 thou and 3 thou styli available). Pw 3-5gm. Compliance  $7.5 \times 10^{-6}$ cm/dyne. FR 20Hz-20kHz. Separation 25dB at 1kHz. Output: 1.8mV. Load impedance 47K. Price: £8.25 (plus £1.94 PT).

### M44E

Stereo Dynetic cartridge. Moving magnet.  $\frac{1}{2}$ in fixing centres. Stylus  $0.7 \times 0.4$  thou bi-radial diamond (3 thou stylus available). Pw  $1\frac{3}{4}$ -4gm. Compliance  $15 \times 10^{-6}$ cm/dyne. FR 20Hz-20kHz. Separation >25dB at 1kHz. Output: 1.8mV. Rec. load 47K. Price: £9.75 (plus £2.29 PT).

### M44-5 ★

Stereo Dynetic cartridge. Moving magnet.  $\frac{1}{2}$ in fixing centres. Stylus 0.5 thou diamond (1 thou and 3 thou styli available). Pw  $\frac{3}{4}$ -1 $\frac{1}{2}$ gm. Compliance  $25 \times 10^{-6}$ cm/dyne. FR 20Hz-20kHz. Separation 25dB at 1kHz. Output: 1.4mV. Load impedance 47K. Price: £9 (plus £2.12 PT).

### M44-7

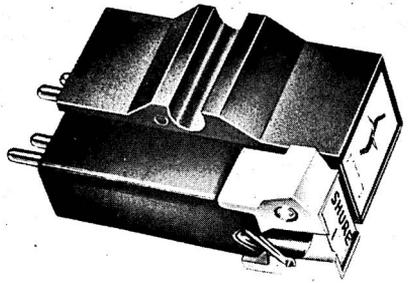
Stereo Dynetic cartridge. Moving magnet.  $\frac{1}{2}$ in fixing centres. Stylus 0.7 thou diamond (1 thou and 3 thou styli available). Pw  $1\frac{1}{2}$ -3gm. Compliance  $20 \times 10^{-6}$ cm/dyne. FR 20Hz-20kHz. Separation 25dB at 1kHz. Output: 2.2mV. Load impedance 47K. Price: £8.25 (plus £1.94 PT).

### M55E ★

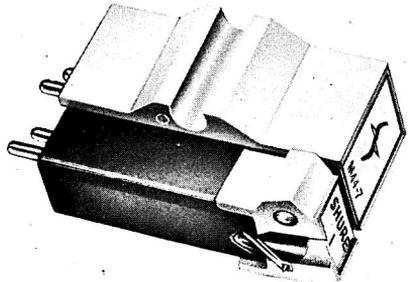
Stereo Dynetic cartridge. Moving magnet.  $\frac{1}{2}$ in fixing centres. Stylus  $0.7 \times 0.2$  thou elliptical diamond (3 thou stylus available). Pw  $\frac{3}{4}$ -2gm. Compliance  $25 \times 10^{-6}$ cm/dyne. Output: 1.3mV. Load imp 47K. Price: £10.50 (plus £2.48 PT).

### M75E Type 2 ★

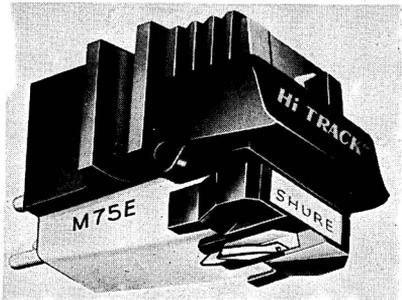
Stereo Dynetic cartridge. Moving magnet.  $\frac{1}{2}$ in fixing centres. Stylus  $0.7 \times 0.2$  thou bi-radial diamond (3 thou stylus available). Pw  $\frac{3}{4}$ -1 $\frac{1}{2}$ gm. Trackability (see note at end) at 1gm in SME



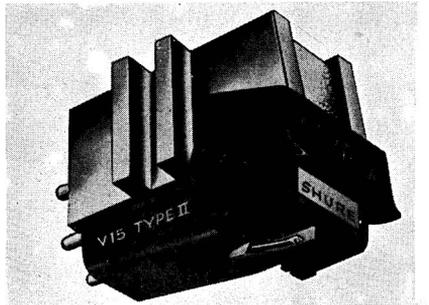
Shure M44-5



Shure M55E



Shure M75E Type 2



Shure V15-11 (improved)

★ Indicates entry is illustrated

3009 arm: 400Hz 20cm/sec, 1kHz 28cm/sec, 10kHz 18cm/sec. FR 20Hz-20kHz. Separation at 1kHz >25dB. Output: 1mV. Rec. load 47K per channel. Price: £17.25 (plus £4.06 PT).

#### M75-6 Type 2

Stereo Dynetic cartridge. Moving magnet  $\frac{1}{2}$ in fixing centres. Stylus 0.6 thou conical diamond (3 thou stylus available). Pw  $1\frac{1}{2}$ -3gm. Trackability (see note at end) at 2gm in SME 3009 arm: 400Hz 28cm/sec, 1kHz 35cm/sec, 10kHz 20cm/sec. FR 20Hz-20kHz. Separation >25dB at 1kHz. Output: 1mV. Rec. load 47K per channel. Price: £13.50 (plus £3.18 PT).

#### M75E-95G Type 2

Cartridge supplied ready-mounted and wired in slide-in carrier for use with Garrard SL95 and SL95B turntables. Gard-a-matic retractile suspension. Price: £18.75 (plus £4.41 PT).

#### M75G Type 2

Stereo Dynetic cartridge. Moving magnet  $\frac{1}{2}$ in fixing centres. Stylus 0.6 thou conical diamond (3 thou stylus available). Pw  $\frac{3}{4}$ - $1\frac{1}{2}$ gm. Trackability (see note at end) at 1gm in SME 3009 arm: 400Hz 20cm/sec, 1kHz 28cm/sec, 10kHz 18cm/sec. FR 20Hz-20kHz. Separation >25dB at 1kHz. Output: 1mV. Rec. load 47K per channel. Price: £14.25 (plus £3.35 PT).

#### M75EJ Type 2

Stereo Dynetic cartridge. Stylus 0.7 × 0.4 thou bi-radial diamond. Pw  $1\frac{1}{2}$ -3gm. Trackability at 2gm in SME 3009 arm 400Hz 28cm/sec, 1kHz 35cm/sec, 10kHz 20cm/sec. Price: £15.75 (plus £3.71 PT).

#### V15-11 (improved) ★

Stereo Dynetic cartridge. Moving magnet.  $\frac{1}{2}$ in fixing centres. Stylus 0.7 × 0.2 thou bi-radial diamond (3 thou stylus available). Pw  $\frac{3}{4}$ - $1\frac{1}{2}$ gm. Trackability (see note at end) at 1gm in SME 3009 arm: 400Hz 28cm/sec, 1kHz 35cm/sec, 5kHz 30cm/sec, 10kHz 22cm/sec. FR 20Hz-25kHz. Separation >25dB at 1kHz, >17dB at 500Hz-10kHz. Output: 0.7mV. Rec. load 47K. Price: £33 (plus £7.76 PT).

#### NOTE

Trackability is a term introduced by Shure to give a measure of the total performance of a cartridge. It takes into account the mechanical design parameters of tip mass, inertia, compliances throughout the system, tracking pressure, recorded velocity, etc. Explanatory leaflet available on request.

#### ■ S.M.E. LTD

Steyning, Sussex BN43LN. Tel: Steyning 2228.

#### Model 3009 ★

(9in). Series II precision pickup arm. Extremely low vertical and lateral friction. Side-thrust com-

ensation. Hydraulically damped lowering control. Tracking force applied precisely, without the need for a gauge. Rapidly adjustable for a wide range of cartridges and heads. Supplied complete with 4ft connecting lead, mounting template, alignment protractor, fixing screws and instructions for use. Price: (with S2 ultra-lightweight shell) £27.70 (plus £6.77 PT); (less shell) £25.50 (plus £6.23 PT).

#### Model 3012

(12in). Series II precision pickup arm. Specification and details as for 3009 except 12in arm: Price: (with S2 ultra-lightweight shell) £29.50 (plus £7.21 PT); (less shell) £27.30 (plus £6.67 PT).

#### Special note

Standard SME arms require  $3\frac{1}{2}$ in clearance under the bedplate. An alternative version (Type HE) has horizontal cable entry and requires only  $2\frac{1}{2}$ in clearance. Type HE can be supplied to order at an additional charge of £1.15 (plus 28p PT).

#### Accessories

S2 ultra-lightweight shell, boxed with mounting hardware and finger lift. Price: £2.20 (plus 54p PT). Precision phono plug. Price: 23p.

#### ■ SONOTONE

Vernitron Ltd, Thornhill, Southampton, Hants, S09 5QF.

Tel: Southampton 44811; Telex: 47138.

#### 2T

Monaural ceramic cartridge with turnover stylus. Stylus sapphire 2.5 thou (78), 0.7 thou (LP). Pw 8-10gm. Compliance  $1 \times 10^{-6}$ cm/dyne. Output: 180mV/cm/sec at 1kHz. Capacitance 650pF. Serviceable under all climatic conditions and compatible for 33 $\frac{1}{3}$ , 45 and 78rpm records. Price: £1.25 (plus 29p PT).

#### 8T4A

Stereo ceramic cartridge with turnover stylus. Sapphire, 2.5 thou (78), 0.7 thou (LP). Pw 4-6 gm. Compliance  $1.4 \times 10^{-6}$ cm/dyne. Separation 25dB at 1kHz. Output: 90mV/cm/sec at 1kHz. Capacitance 650pF. Price: £1.75 (plus 41p PT).

#### 9TA

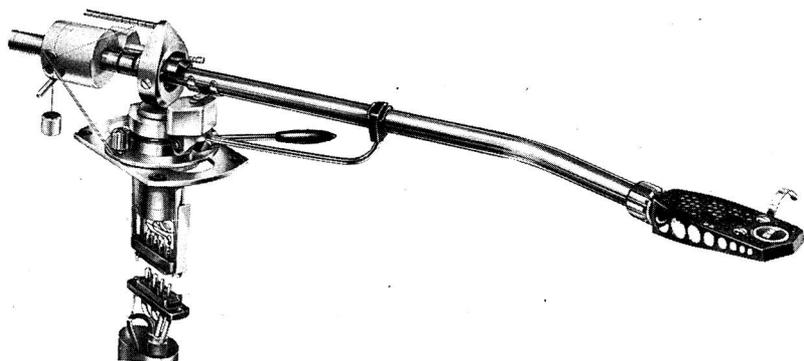
Stereo turnover ceramic cartridge. Sapphire stylus. Pw 2-4gm. Tip mass 3.5mg. Compliance  $5.3 \times 10^{-6}$ cm/dyne. FR 30Hz-15kHz  $\pm 3$ dB. Separation 27dB. Output voltage: 80-120mV. Load imp 2 megohm. Price: £2.50 (plus 59p PT).

#### 9TAD

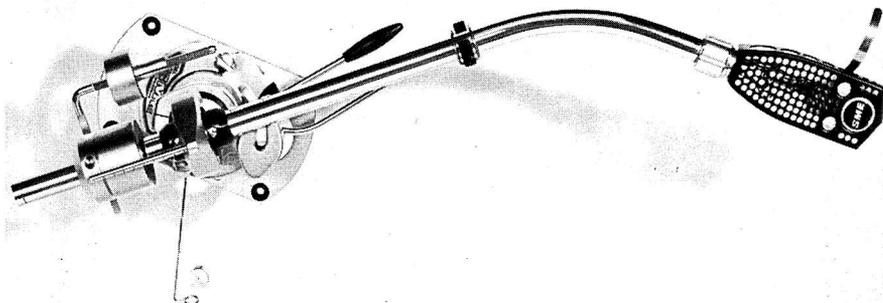
Similar specification to 9TA but with diamond stylus. Price: £3.25 (plus 77p PT).

#### 9TAHC

Stereo turnover ceramic cartridge. Choice of both sapphire styli or sapphire 78/diamond



*SME Series 2 precision pickup arm and shell*



*SME Series 2*

stereo LP. FR 20Hz-20kHz  $\pm 3$ dB from 1kHz. Rec. load 2M. Sensitivity 55-85mV/cm/sec at 1kHz. Lateral compliance  $8.5 \times 10^{-6}$ cm/dyne. Separation 25dB at 1kHz. Pw 1-3gm. Tip mass 2.5mg. Capacitance 800pF. Price: with sapphire stylus £2.50 (plus 59p PT); with diamond stylus £3.25 (plus 77p PT).

#### 2109

Mono Rochelle cartridge. Output at 1kHz 700 mV/cm/sec. Capacitance 800pF. Compliance  $1.5 \times 10^{-6}$ cm/dyne. Tracking  $+12$ dB at 5gm. FR 100Hz-8kHz  $\pm 3$ dB. Rec. stylus force 6-8gm. Price: £1.38 (plus 32p PT).

#### 2509

Stereo Rochelle cartridge. Output at 1kHz: 340mV. Capacitance 1000pF. Channel difference less than 3dB. Separation at 1kHz better than 12dB. Pw 7gm. FR 50Hz-8kHz  $\pm 3$ dB. Price: £1.95 (plus 48p PT).

#### 2539

Stereo Rochelle cartridge. Output at 1kHz 550 mV/cm/sec. Capacitance 800pF. Channel difference less than 3dB. Separation at 1kHz better

than 12dB. Tracking  $+9$ dB at 9gm. FR 100Hz-8kHz. Rec. stylus force 8-10gm. Price: £1.95 (plus 48p PT).

#### 3509

Stereo ceramic cartridge. Output at 1kHz: 140 mV/cm/sec. Channel difference less than 3dB. Separation at 1kHz: better than 15dB, typically 20dB. Capacitance 600pF. Tracking  $+12$ dB, typically  $+15$  at 5gm. FR 100Hz-8kHz  $\pm 3$ dB. Rec. stylus force 5-7gm. Price: (with sapphire stylus) £2.25 (plus 55p PT); (with diamond stylus) £2.59 (plus 63p PT).

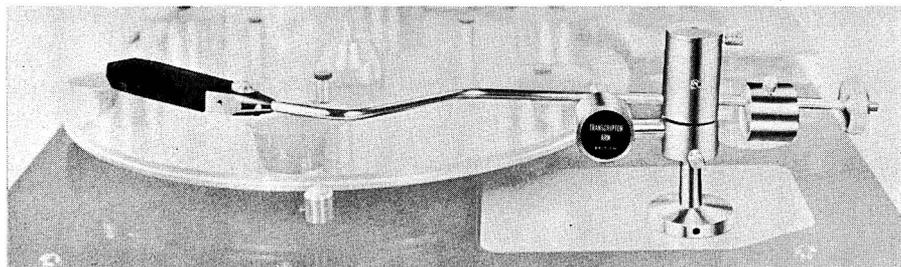
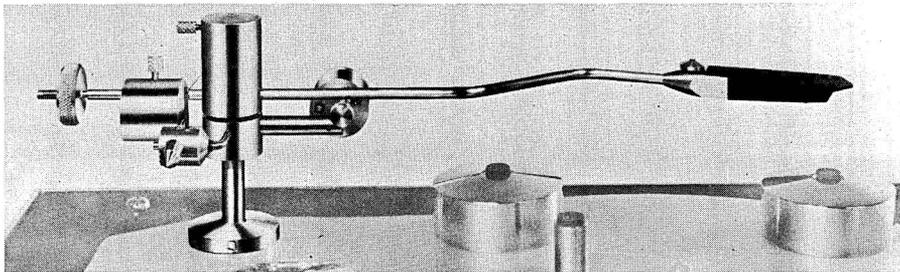
#### 3559

Ceramic stereo cartridge with stylus. Pw: 2½-4gm. FR: 20Hz-12kHz. Separation: better than 15dB at 1kHz. Output: 70mV cm/sec nominal. Rec. load: 2 megohms and 100pF. Price: (sapphire stylus) £2.35 (plus 57p PT); (diamond stylus) £2.69 (plus 65p PT).

#### 3549

Ceramic stereo cartridge with stylus. Pw: 3-5gm. FR: 30Hz-10kHz. Separation: better than 15dB at 1kHz. Output: 100mV cm/sec nominal. Rec.

★ Indicates entry is illustrated



*Transcriptors Fluid Arm*

load: 2 megohms and 100pF. Price: (sapphire stylus) £2-35 (plus 57p PT); (diamond stylus) £2-69 (plus 65p PT).

#### SONY (U.K.) LTD

Pyrene House, Sunbury Cross,  
Sunbury-on-Thames, Middlesex.  
Tel: Sunbury 87644/7.

#### Sony VC-8E

Stereo moving coil cartridge. Stylus 0.2 × 0.8 thou diamond. Pw 0.5-2gm. Lateral and vertical compliance  $10 \times 10^{-6}$ cm/dyne. FR 10Hz-25kHz. Separation 30dB at 1kHz, 20dB at 10 kHz. Output: 4mV ± 2dB. Rec. load approx 40 ohms at 10Hz-25kHz. Price: £28-88 (including PT).

#### TANNOY PRODUCTS LTD

West Norwood, London, SE27.  
Tel: 01-670 1131. Cables: Tannoy, London.

#### Varilutance

Turnover cartridge. Output voltages: LP: 10-12mV; 78 18-20mV. Range 20Hz-16kHz ± 2dB. Pw 5-6gm (less with professional arms). Load imp 50K ohms. Price (with 2 diamonds): £12 (plus £3-18 PT); (with 1 diamond and 1 sapphire): £9-50 (plus £2-52 PT); (with 2 sapphires): £7 (plus £1-85 PT). Compatible styli available £3 (plus 80p PT). Lightweight stereo/mono styli assembly. Price: £3 (plus 80p PT).

Single stylus version of Varilutance for LP also available. Price (with diamond): £6-75 (plus £1-52 PT).

#### TRANSCRIPTORS LTD

2 Theobald Street, Boreham Wood, Herts.  
Tel: 01-953 0771.

#### Transcriptors fluid arm ★

Stereo or mono low-mass arm with fluid Unipivot mount. Modular counter-weight system with fine balance adjustment. Suitable for all cartridges with compliance of  $15 \times 10^{-6}$ cm/dyne or above, tracking at not more than 2.5gm. Hydraulic lowering device with manual override control. Incorporates precise cueing system. Single hole fixing. Integrated leads. Plug-in head shell. Roller-action adjustable bias compensation. British made. Price: £18 (plus £4-30 PT):

#### WORDEN AUDIO DEVELOPMENTS LTD

54 Chepstow Road, London, W2.  
Tel: 01-229 4996.

#### Worden articulated arm Mk III

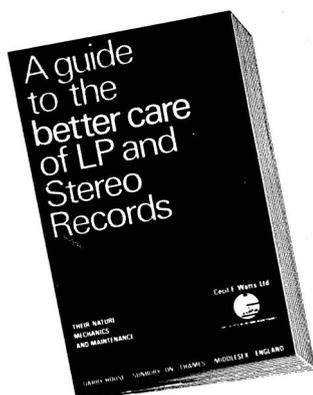
Radially operative single arm with articulated head piece. Tracking correct to  $\pm 4^\circ$ . Vertical and lateral friction less than 50mg. Adjustable counter-balance weight. Height adjustment. Detachable head-shell accepts all standard  $\frac{1}{2}$ in centre fixing cartridges. No resonances above 10Hz. Extra head shells available. Built-in lowering and lifting device. Price: to be announced.



# TAKE CARE OF YOUR RECORDS

*Use the world's best cleaning  
and maintenance devices.*

**WATTS EQUIPMENT CARES FOR YOUR  
RECORDS IN ALL CONDITIONS OF USE**



Only the user knows the local conditions in which his records will be played. A study of the Booklet "A GUIDE TO THE BETTER CARE OF YOUR L.P. & STEREO RECORDS" will, it is hoped supply the necessary information to enable him to choose the appropriate device to suit his particular requirements.

**SEND IMMEDIATELY 15p POST FREE**

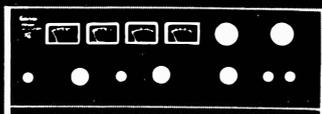
**CECIL E. WATTS LIMITED  
DARBY HOUSE · SUNBURY ON THAMES · MIDDLESEX**

# Sansui break the 4D sound barrier

2-channel stereo signals transformed by a unique reproducing matrix circuit into exactly duplicated sound waves—the multi-dimensional sound field. Obviating the need for and surpassing 4-channel stereo. Yet achieving reproduction so precise it defies comparison. Due to the remarkable technique of 'Phase Modulation'. Another amazing breakthrough for Sansui—makers of quality amplifiers, tuners, speakers, turntables and stereo headphones.

## the Sansui QS-1 synthesizer

Also available—  
**SONOTONE** pick up cartridges, the climax of 40 years experience. One of the most widely sold cartridges in Europe.



Both marketed exclusively by:  
**VERNITRON LIMITED**

Thornhill, Southampton SO9 5QF, England.  
Telephone: Southampton 44811  
Cables: Vernitron Soton. Telex: 47138

# Pickup Accessories

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ ADASTRA ELECTRONICS LTD

Unit 22, Cricklewood Trading Estate,  
Claremont Road, London, NW21TU.  
Tel: 01-452 6288 (answering service 01-452 6289)

### Imp-Verta ★

Matches low impedance PU cartridges, microphones and tape heads into high impedance amplifier inputs. Solid state printed circuit device using silicon transistor. Automatically switched internal 9V battery. Negligible drain. Conversion factor approximately 20 (depending on load). Virtually no hum or signal loss. Metal case, black crackle finish. Size:  $5 \times 1\frac{1}{2} \times 1\frac{1}{2}$ in. £3-50.

## ■ BIB

Multicore Solders Ltd, Bib Division,  
Maylands Avenue, Hemel Hempstead, Herts.  
Tel: Hemel Hempstead 3636.

### Stylus and turntable cleaning kit

Includes: cleaning cloth, non-inflammable anti-static cleaning fluid and small nylon brush applicator. Brush can be fastened to board by small suction pad. Price: 34p.

### Anti-static cleaner

Non-inflammable anti-static fluid with cleaning cloth. Does not smear or scratch. Suitable for instrument panels, plastic, chrome, glass and exteriors of electronic equipment. Price: 22½p.

### Record covers

12in. Shaped containers made from clear plastic sheet. Protects records from dirt and prevents wear. One required for each record. Price: pack of five 12½p.

### Record sleeve protectors

Made from strong clear plastic to fit over record sleeve and keep like new. Price: pack of five 15p.

### Stylus balance ★

Made from non-magnetic material and fitted with non-scratch base. Measures from  $\frac{1}{4}$  to 5gm and calibrated to be accurate to within  $\frac{1}{4}$ gm. Simple to use and supplied with full instructions. In presentation case. Price: £1-80.

### Groov-Kleen Model 40

Automatic record cleaner in the form of a minia-

ture pickup arm equipped with brush to loosen the dust and a non-revolving roller which sets the height and collects the dirt. Self-adhesive base for fitting to motor board. Finished in anodised aluminium with chromium-plated adjustable pillar. Swivelling armrest provided for use when cleaner is not traversing a record. Designed to fit any make and model of turntable, including the Garrard SP25 Mk III. Packed in transparent plastic box. Price: £2-08 (plus 51p PT).

## ■ BLACK KNIGHT RUMBLECURE

Bank Top, Currier Lane,  
Ashton-under-Lyne, Lancs.  
Tel: 061 330 2836 (24-hour service).

Specialists in curing rumble due to acoustic feedback through floors and cabinets.

Kits and items designed to isolate and acoustically damp pickup arms, turntables, motor units, plinth assemblies, tape recorders, speaker enclosures and other audio equipment.

Plinths fitted with Rumblecure equipment available. Details on request. Many standard items now available and more being added all the time. Quotations on receipt of full details of equipment.

## ■ BURNE-JONES & CO LTD

18 Brunswick Road, Sutton, Surrey.

### Alignment protector ★

For measuring the tracking accuracy of all pickup assemblies. Made in plastic ivory. Price: 50p.

## ■ B. & W. ELECTRONICS

Bowers & Wilkins Electronics Ltd,  
Littlehampton Road, Worthing, Sussex.  
Tel: Worthing 66830.

### SE/A

A special equaliser for the Shure V15/11 and similar cartridges designed for use with SME Series II pickup arms.

## ■ CLENDISC (Mail Order) LTD

7 Trinity Court, Gray's Inn Road,  
London, WC1. Tel: 01-837 9088.

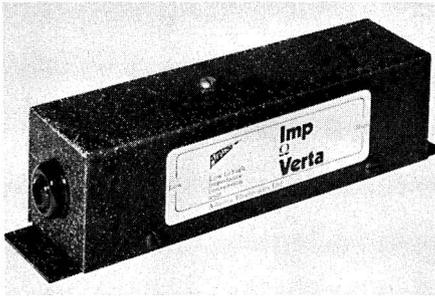
### Clendisc

An anti-static cleaner and preservative for records, photographic and optical lenses, copying machines, tape heads and computers. 4 fl oz bottles. Price: 22½p.

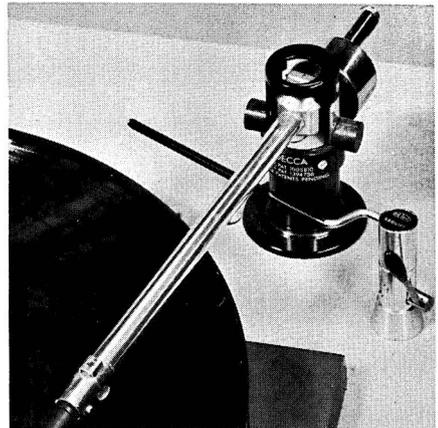
### Clendisc Cleaning Pad

Pad impregnated with Clendisc fluid which assists in the removal of dust and dirt and also neutralises any electrostatic charges present. Price: 16½p (including PT).

★ Indicates entry is illustrated



Adastra Imp-Verta



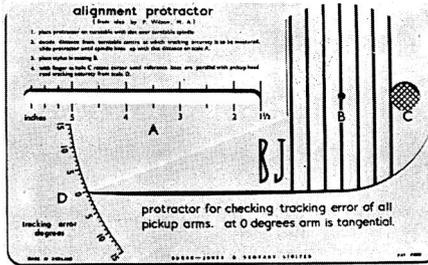
Colton Varilift



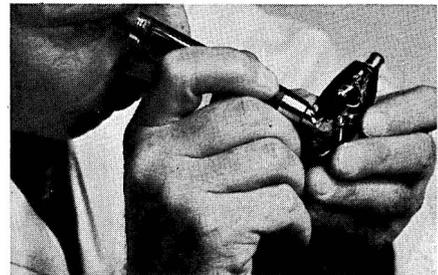
Bib Stylus Balance



Colton Precision level



B-J alignment protractor



Colton Times-Fifty Stylus Viewer



Colton Antistaticcloth



Colton Magnalift

## ■ COLTON

Musonic Ltd, 34-38 Verulam Road, St Albans, Herts. Tel: St Albans 50611/2.

### Antistaticloth ★

A soft cloth impregnated with an anti-static material, for cleaning records. Price: 14p.

### Record adaptors

EP record centre adaptors (45rpm). Small plastic centre-pieces which enable EP records to be used again on slim spindle changers after the large centre-piece has been removed. Price: 16p per packet of one dozen (plus 4p PT).

### Varilift Mk II ★

Fluid damped pickup lift and lowering device, lever operated. Replaces the previous button-operated hydraulic device, and is basically smaller, neater and utilises an offset fixing bracket permitting it to be fixed directly under pickup in the most effective position. Price: £3.04 (plus 71p PT).

### Precision level ★

Circular bubble-type spirit level in white plastic case  $1\frac{1}{8}$ in diameter,  $\frac{1}{2}$ in high. Three fixing holes provided or it may be fixed with adhesive. Ensures accurate levelling in all directions. Price: 34p.

### Antistatimat

All-rubber 12in turntable mat. Accurately balanced and moulded with guard edge recess. Introduction of certain materials into the rubber renders it conductive to static charges on micro-groove records. When a record is placed on the mat static charges are dispersed freeing the record from induced noises without use of sprays, etc. Price: 67p (plus 17p PT).

### Plastisleeves

Made from 200-gauge polythene and designed to protect micro-groove records from dust and damp. Supplied in packets of 12. Prices: 7in round bottom 14p, 12in round bottom 28p.

### Plasticovers

Made from 200-gauge polythene and designed to protect record sleeves against rubbing and scratching. Supplied in packets of 12. Price: 7in square bottom 8p, 12in square bottom 17p.

### Times-Fifty ★

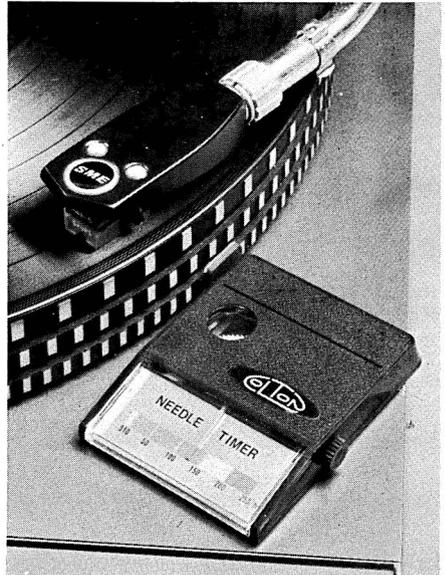
Miniature pocket microscope with stylus locating slot and adjustable focus. Gives clear picture of stylus tip at X50 magnification.  $4\frac{1}{2}$ in long and fitted with pen clip. Price: 88p.

### Magnalift ★

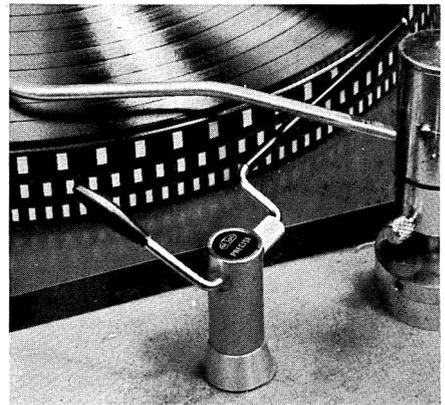
Centre lift-off device. Fixes beside pickup and automatically lifts arm off record at end of playing cycle. Finished in black wrinkle and satin chrome. Latest version is smaller and lower than earlier models. Can be used with players having close-fitting clear plastic cover. Price: £2.62 (plus 62p PT).



Colton Varilift



Colton Stylus timer



Colton Precise lift

★ Indicates entry is illustrated

### Variscale ★

Tracking force indicator. Simple and accurate stylus balance measuring from  $\frac{1}{2}$  to 6gm. Finish: black wrinkle and satin chrome. Price: 97p (plus 23p PT).

### Precise ★

Manually operated pickup lifting device. Simple precise movement. Singlehole mounting. Finish: satin chrome. Price: £1.49 (plus 35p PT).

### Superactive

New formula anti-static fluid. For cleaning and neutralising static in records and other plastic surfaces. Can be applied with sponge or cloth, leaves no sticky deposit. Suitable for recharging anti-static devices. Supplied in dispenser with dropper nozzle. Price: ( $\frac{1}{2}$ oz) 13p, (1oz) 23p.

### Stylus Life Timer ★

This unique device measures only  $2 \times 2\frac{3}{4} \times \frac{3}{8}$  in. The magnetically actuated precision mechanism registers in playing hours on a scale 0-400. At 400 hours it can be reset to 0. Finish: black with silver dial. Price: £2.18 (plus 51p PT).

### Gripex

Anti-slip dressing. A spirit suspended solution supplied in 1 fl oz bottles with brush. Applied thinly to drive surfaces of belts or friction wheels, it dries in 10-15 minutes. Price: 25p per bottle.

### Coltonian record racks

Heavy gauge steel wire welded at all joints. Available plated or plastic coated, gilt, copper, black, red, grey or blue and fitted plastic feet. Prices: from 35p (plus 9p PT).

### Record carrying cases

Three basic sizes: 12in  $\times$  50, 12in  $\times$  25 and 7in  $\times$  50. Finish: padded PVC in red, blue, black and brown. Prices: from £1.39 (plus 33p PT).

## ■ CONNOISSEUR

A. R. Sugden & Co (Engineers) Ltd,  
Market Street, Brighouse, Yorkshire.  
Tel: Brighouse 2142. Cables: Connoisseur,  
Brighouse.

### Connoisseur Stylus Balance ★

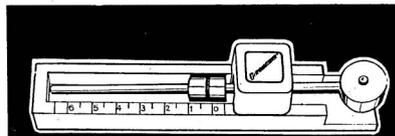
Precision stylus balance with sliding weight adjustment. Scale calibrated 0-6gm. Simple operation giving accurate stylus pressure settings. Price: 90p (plus 21p PT).

## ■ DECCA

Decca Special Products, Ingate Place,  
Queenstown Road, London, SW8.  
Tel: 01-622 6677.

### Magnetic bias compensator

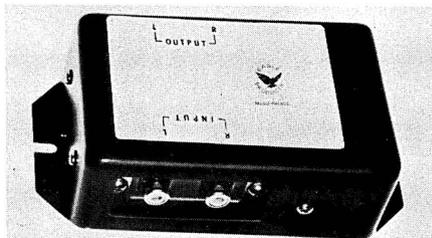
Neat, simple, unobtrusive device using magnetism precisely to neutralise the forces which draw a pickup towards the centre of the turntable. Type A for Mk I and Mk I 'Super' *ffss* arms, and



Connoisseur stylus balance



Decca Microlift



Eagle PRE402 pickup preamp

for Deram ARI arm. Price: £1.01 (plus 24p PT).

### Centre locator

Fits on *ffss* arm like *ffss* head. Pickup arm is correctly positioned when the locator moulding fits the turntable centre spindle. Price: 24p (plus 6p PT).

### Decca Microlift ★

A device for raising and lowering a manual pickup arm at any point on the record for minimising risk of damage either to record or stylus through handshake. Easy to fit to most types of back-pivoted pickup. It does not hinder record handling by over-lapping the turntable. Price: £1.42 (plus 33p PT).

### Deccalift

Motorised lifting and lowering device which can be controlled at the turntable and/or remotely. Requires 6-3V AC. Transformer optional extra. Price: £6.88 (plus £1.62 PT).

### ■ EAGLE INTERNATIONAL

Heather Park Drive, Wembley, HA1 1SU.  
Tel: 01-903 0144.

#### PRE 402 ★

Mains powered stereo pickup preamplifier for magnetic cartridges including Eagle LC 05 and LC 07. Provided with dual phono sockets  
Price: £4.95.

### ■ EXPERT PICKUPS LTD

PO Box No. 3, Ashstead, Surrey.  
Tel: Ashstead 73704.

#### Expert moving coil pickups serviced

Full details on request.

#### Replacement stylus service

For detachable cantilever systems using client's own stylus assembly. Radius to choice; from 0.5 thou (stereo) to 4 thou (78 oversize). Ellipticals where suitable. Radius checked using X 500 magnification.

#### Grade A transcription diamond styli

Finest quality, highly polished, giving minimum background noise and optimum results. Spherical or elliptical tip.

#### Grade B

Commercial standard, 0.5 thou to 2.5 thou only. Oversize sapphires and diamonds (Grade A only) for Pathe and Edison reproducers formed and fitted. Expert Pickup diamonds are manufactured only to customers' specifications.

Special quotations and prospectus on request.

#### To collectors of 78rpm records

Advice available as to the best methods of reproducing from old 78rpm records.

#### Replacement stylii

Complete range of replacement stylii in sapphire and commercial diamond, also professional Grade A diamonds of our own manufacture.

#### Disc-cutting stylii

Cutters to CBS specification. Development to other specifications carried out.

#### Leak pickup servicing

Sole agents for the servicing of Leak Mk I and Mk II pickups.

### ■ GOLDRING MANUFACTURING CO (Great Britain) LTD

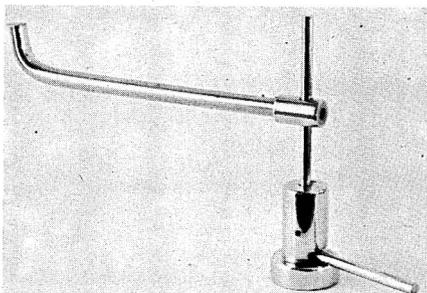
10 Bayford Street, Hackney, London, E8 3SE.  
Tel: 01-985 1152.

#### Lenco STB.2

Stylus pressure balance. A simple and accurate device, not relying on springs. Price: 75p (plus 18p PT).

#### Lencoclean

Record cleaning device mounted on turntable. Tracks in front of the pickup, dispensing a



*Hadcock GH Uni-lift*

narrow band of special fluid. Leaves no deposit on record, cleans the groove and cools the point contact. Keeps stylus point clean. Price: £2.50 (plus 60p PT).

#### Lencoclean refill £1.

#### Goldring/Lenco VV7

Stereo preamplifier for magnetic cartridges. Input: 1mV 47K. Noise level: —60dB. Output: 100mV RMS. Mains: 200-240V 50Hz. Size:  $4\frac{1}{2} \times 2 \times 1\frac{1}{2}$ in. Price: £8.50 (plus £2.03 PT).

### ■ GRUNDIG (Great Britain) LTD

Newlands Park, Sydenham, London, SE26.  
Tel: 01-778 2211.

#### MV3

Transistorised stereo preamplifier for magnetic cartridges. Designed to convert radios and amplifiers designed for crystal PU only. Corrected to CCIR standards of 3180, 318 and 75µ secs. Operates from external supplies of 27-40V DC, or 200-240V DC. Amplification factor: 38 dB. Separation: 46dB from 30Hz-16kHz. Maximum input: 50mV at 1kHz. Consumption: 2.5-11mA. Size:  $3\frac{1}{2} \times 1\frac{1}{4} \times 2\frac{3}{4}$ in. Price: £5.77.

### ■ G. F. C. HADCOCK

Audio Division, The Old Vicarage, Doveridge, Derby, DE65NN. Tel: Uttoxeter 2452.

#### GH Uni-lift ★

Raising and lowering device suitable for use with all pickup arms. Two-hole fixing for stability. Ensures accurate lowering and easy cueing. Allen key provided for height adjustment of horizontal arm. Finish: chromium-plated brass. Price: £2.35 (plus 63p PT).

### ■ JOHN HORWITZ

305 Kenton Road, Kenton, Harrow, Middlesex. Tel: 01-907 6667.

#### Stereo stamp

Rubber stamp to enable record collectors to

★ Indicates entry is illustrated

label stereo discs to make them immediately visible. Price: 40p including postage.

### ■ HOWLAND-WEST LTD

2 Park End, South Hill Park, London, NW3.  
Tel: 01-794 6666/6033.

#### Howland-West Alignment Protractor ★

Made in laminated Perspex. Provides facilities for checking: (1) vertical tracking angle, (2) lateral tracking angle and (3) channel balance and separation. Price: 52½p.

### ■ LENNARD DEVELOPMENTS LTD

Lockfield Avenue, Brimsdown, Middlesex.  
Tel: 01-804 8141.

#### Play-fair Stylus Timer

Manually operated device which indicates when stylus is due for replacement. Self-adhesive to attach to motor board if desired. Swiss mechanism. Neat plastic case with instructions. Two models: one for sapphires, one for diamonds. Price (either model): 81p (plus 17p PT).

#### Play-fair Cleaning Pad

Anti-static. Price: 10p.

#### Play-fair Stylus Cleaners

Cleaning fluid with separate brush. In presentation case. Price: 30p.

#### Play-fair Antistatic Cleaning Fluid

30cc polythene bottle. Price: 23p.

#### Play-fair Discoda

Record sleeve indexing device for quick identification of records. Price: 3 for 13p, 12 for 40p. (Bulk prices on application).

#### Micro-Diamond replacement styli

Comprehensive range. Also retipping service. Price: on application.

### ■ METRO SOUND

Metrosound Audio Products Ltd,  
Cartersfield Road, Waltham Abbey, Essex.  
Tel: Waltham Cross 31933.

#### M.2 Record Cleaning Sponge

Special soft texture for cleaning of records. Price: 13p (plus 3p PT).

#### M.3 Record Care Kit

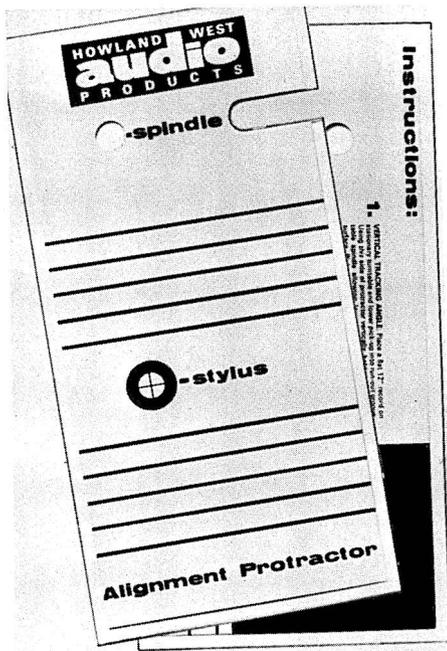
Comprising bottle of Metro-Spray spirit-based anti-static record cleaning fluid; special texture sponge applicator with moulded handle; and soft stylus cleaning brush. Price: 35p (plus 4p PT).

#### M.10 Metro-Mat ★

Ribbed rubber full transcription size anti-static turntable mat, complete with separate stroboscope. Price: 63p (plus 15p PT).

#### M.11 Hi-Fi Stylus Cleaning Kit ★

Bottle of specially developed mild solvent fluid.



Howland-West Protractor



Metrosound Metro-mat



Metrosound stylus cleaning kit

Moulded plastic retaining clip-on bottle for soft nylon-cleaning brush. Price: 35p (plus 9p PT).

**M.21 Metro Scale Stylus Balance**

Works on knife edge balance principle. Supplied with eight plastic weights enabling checking from ¼gm to 4½gm. Price: 35p (plus 9p PT).

**M.23 Spirit level**

Plastic spirit level for use on turntables, etc. Price: 35p.

**M.24 Lubricating Kit**

Suitable for transcription turntables and mechanical moving parts. Comprises small bottle each of R.O.B. and R.O.G. oil and container of Starfax. Price: 35p.

**M.26 Ioniser**

High-fidelity record cleaner. Permanently anti-static, humid soft velvet enclosed in plastic moulding. Price: 37½p.

**M.27 Anti-static cleaning cloths**

Permanently impregnated anti-static record cleaning cloth. Price: 15p.

**M.28 High Fidelity Maintenance Kit**

Designed for optimum maintenance of transcription record players and discs. Contents: ioniser, hi-fi cleaning kit, Metro Scale stylus balance, lubricating kit, and spirit level. Price: £1.75 (plus 18p PT).

**M.31 Thorens anti-skating device**

For use with T.P.13 pickup arm as supplied with Thorens T.D.150A and T.D.150AB transcription turntables. Price: £1.25 (plus 33p PT).

■ **MICRO-SEIKI**

Distributors: B. H. Morris & Co (Radio) Ltd, 84-88 Nelson Street, London, E1 2DY. Tel: 01-790 4824.

**MSB-1 ★**

Micro shock absorber. Microsorber employs air-damped high efficiency materials to eliminate acoustic feedback to the record playing deck. Is adjustable for height to equalise unbalanced weight of turntable. Price: (set of four) £4.94 (including PT).

**MTA-41 ★**

Solid-state stereo preamplifier for use with MC-4100 moving coil or similar cartridges. By-pass switch permits use of higher output cartridges. Operation from two 1.5V batteries. Grounded base transistor circuits. Price: £11.

■ **KEITH MONKS (Audio) LTD**

5 Fleet Road, Fleet, near Aldershot, Hants. Tel: Fleet 7316.

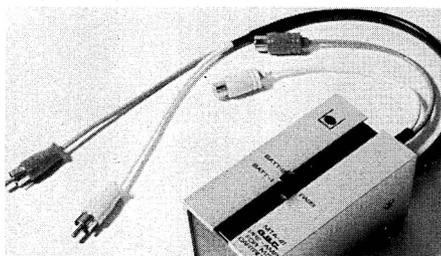
**Professional Record Cleaning Machine ★**

Used by broadcasting companies, sound studios, record retailers and gramophone libraries.

Special washing, scrubbing and suction action



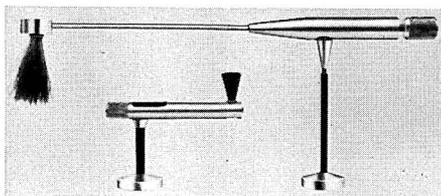
Micro-Seiki MSB-1



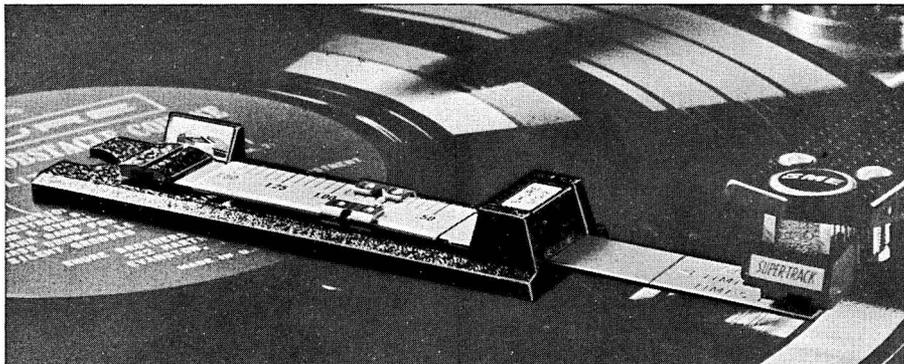
Micro-Seiki MT4-41



Keith Monks Record Cleaning Machine



Transcriptors sweep arm and stylus brush



Shure SFG2 Stylus Tracking Force Gauge

leaves record clean and dry. Retail price: (single) £225; (double) £306-67.

The following dealers offer a record-cleaning service to the public using Keith Monk's equipment. The list is not necessarily comprehensive and other shops with the equipment installed are invited to submit details for publication in future issues of the Year Book.

- Central Records, Ashton-under-Lyne.
- Curtiss Records, Sheffield.
- Grahams, Pentonville Road, London, N1.
- Griffin Radio, Birmingham.
- J. Windows, Newcastle upon Tyne.
- Ken Rose, Fleet, Hants.
- Marble Arch Cameras, Edgware Road, London.
- Sound Incorporated, Wimbledon, London, SW19.
- Sound Studios, Crawley, Sussex.
- Vallances, Leeds.

■ **MULTICORE** See Bib.

■ **PLAY-FAIR** See Lennard Developments.

■ **SCHWEIZER**  
Highgate Acoustics Ltd,  
184-188 Great Portland Street, London, W1.  
Tel: 01-636 2901.

**Record Fluid**  
Distilled and demineralised water for cleaning records. Completely harmless to record surface. The fluid evaporates leaving the disc clean and free from residue. Price: 32½p.

**Record grip**  
Designed to grip records firmly and correctly, preventing fingers from coming into contact with the surfaces. Available in white, blue, orange and yellow. Price: 29p.

**Record system**  
Record storage system comprising five single

units that join together to form a stable rack. Space between each unit holds six LPs or twelve 7in records. Available in blue, grey, white, orange, yellow or green. Price: 60p (plus 15p PT).

■ **SHURE ELECTRONICS LTD**  
84 Blackfriars Road, London, SE1.  
Tel: 01-928 3424.

**SFG2 Stylus gauge ★**  
Accurate beam balance type gauge designed for measuring tracking force in the range of 0.5gm to 3gms. Measures existing playing weight of arm, or can be used to adjust arm to a desired tracking force. Price: £3-60 (plus 85p PT).

**M64-E**  
Preamplifier for use with magnetic pick up head and amplifier not having sensitive enough input. Full specification and price in Amplifier Section.

■ **TRANSCRIPTORS LTD**  
2 Theobald Street, Boreham Wood, Herts.  
Tel: 01-953 0771.

**Transcriptors Stylus Scale**  
Precision scales in polished aluminium with jewelled pivot. Sensitive to less than 0.01gm. Accuracy better than 0.02gm. Measures 0.5gm in increments of 0.05gm. Bubble read-out. Supplied with reference calibration check weights. British made. Price: £3 (plus 70p PT).

**Transcriptors Sweep Arm ★**  
Record cleaning device for permanent fixing. Height adjustable over 3½in. Tracks at ¼-½gm. Balance cursor. Integrated parking device. Precision unipivot construction. Polished aluminium. British made. Price: £3 (plus 70p PT).

**Transcriptors Stylus Brush ★**  
For permanent installation. Comprises squirrel hair brush for cleaning stylus. Adjustable for height. Single hole fixing. Polished aluminium

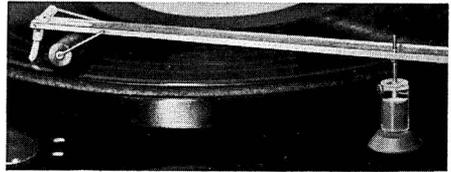
construction. British made. Price: £1.85 (plus 45p PT).

## ■ WAL

Sole distributor: A. C. Farnell Ltd,  
Consumer Division, Farnell House,  
81 Kirkstall Road, Leeds, LS31HR.  
Tel: Leeds 35111.

### Universal WAL Gain stereo pre-amplifier unit

For amateur tape, cine and professional sound recording. RIAA equalisation for magnetic cartridges. Flat response pre-amp for low impedance microphones. Equalised inputs for magnetic pickups for transfer to sound on film. Equalised CCIR built-in correction, for tape heads, 2 or 4 track. Monitoring pre-amp for use direct from tape head to enable one track to be synchronised with another. Transfer from tape deck mechanism to tape recorder. Track-to-track transfer equalised to CCIR for transferring information on 4-track tape recording equipment. Mixer for low impedance microphones, gramophone or tape, RIAA, CCIR, or flat response. Headphone monitoring facilities. Psn 220-245V. Price: £10.97½.



Watts 'Dust Bug'



Watts Disc Preener

## ■ CECIL E. WATTS LTD

Darby House, Sunbury-on-Thames, Middx.  
Tel: Sunbury 3252.

### Watts Dust Bug ★

Claimed to be the most efficient method of removing static and dust from records as they are played. Instantly fitted, suitable for all types of records. Record quality is improved, surface noise and wear reduced. Price: £1 (plus 24p PT).

### Watts Disc Preener ★

For record maintenance where anti-static agents are not desirable (where stylus force is less than 2gm). Price: 35p.

### Watts Manual Parastat with Humid Mop ★

Manual model Parastat record cleaning machine. For cleaning and applying anti-static agents to LP records. Complete with humid mop for cleaning bristles and velvet pads. Price: £2.65.

### Watts Manual Parastat ★

Available separately (without Humid Mop). Price: £2.40.

### Watts Humid Mop ★

Available separately. Price: 25p.

### Hi-Fi Parastat Model Mk 4 ★

Gramophone record maintenance and stylus cleaning kit. Designed for use on records in new condition which are played with pickups requiring very low tracking pressures. Price: £2.20 (plus 6p PT).



Watts Manual Parastat with Humid Mop



Watts Manual Parastat

★ Indicates entry is illustrated



Watts Humid Mop and new formula fluid



Watts Hi-Fi Parastat

### Watts Stylus Cleaner

As included with Hi-Fi Parastat kit. Price: 25p (plus 6½p PT).

### Watts Spares and Replacements

Dust bug nylon bristle and plush pad. Price: 10p.

New Formula Dispenser. Price: (½oz) 15p; (1oz) 25p.

Preener Wicks. Price: (packet of four) 10p.

Manual Parastat Brush. Price: 65p.

Parastat Nylon Velvet Pad Covers. Price: 20p a pair.

Parastat White PVC Sponge. Price: 5p.

Humid Mop (sponge and four wicks). Price: 15p.

Hi-Fi Parastat Distilled Water Dispenser. Price: 20p.

Hi-Fi Parastat pad cover and ribbons. Price: 10p.

### ■ WILSON STEREO LIBRARY LTD

104-106 Norwood High Street, London, SE27.  
Tel: 01-670 6394.

### W.S.L. Blank Disc

Highly polished blank vinyl disc for adjusting side thrust and alignment. Indicates the amount of side thrust to be corrected. Mirror-like surface reflects underside of cartridge and stylus and assists in accurate alignment. Supplied with instructions for correcting side thrust. Price: 70p, postage and packaging included.

### W.S.L. Side Thrust Corrector

Pulley device which may be fitted to any pickup to correct side thrust. Should be used in conjunction with W.S.L. Blank Disc for precise elimination of side thrust. Price: 45p (including PT), postage and packing included.

## PLAY FAIR

Record Accessories. Stylus Timers, Stylus Cleaners, Antistatic Cleaning Pads, Antistatic Fluid, Discodas.

## MICRO-DIAMOND

Replacement Styli. Most comprehensive range, best quality, reliable service, keen prices; also MICRO-DIAMOND retipping service.

## WALTON

M.I. Pickup cartridges.

## DRY-SPLICE

Tape Accessory and MINIFLUX Tapeheads.

Manufacturers and Distributors:

**LENNARD DEVELOPMENTS LTD**  
LOCKFIELD AVENUE, BRIMSDOWN,

ENFIELD, MIDDLESEX

Tel: (01) 804 8141

# A. C. FARNELL LIMITED

## WAL D-MAG

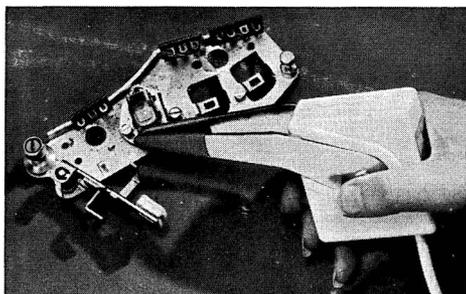
### PIN POINT ERASER FOR STRIPED FILM AND TAPE RECORDING

WAL D-MAG has been developed to deal with the two most common problems that occur when recording sound on film or tape viz., the removal of background noise and the demagnetisation of tape heads.

#### OPERATION DETAILS

Simply place tape or film between probes checking that it lies on one of the arms. Switch on. Move arms slowly along films or tape. Keep pressed against one side of the arm. When area to be erased is complete remove D-MAG. Switch off only when at least 12" away from tape or film.

Recommended Retail Price £3.77 inc. P/T.



## WAL PROFESSIONAL TAPE ERASER

It will erase both sides of a 7" tape reel in only 30 seconds, and sound from 16 mm 10" aluminium reels.

The WAL Professional Tape Eraser saves time and expense when overhauling single or multiple tapes.

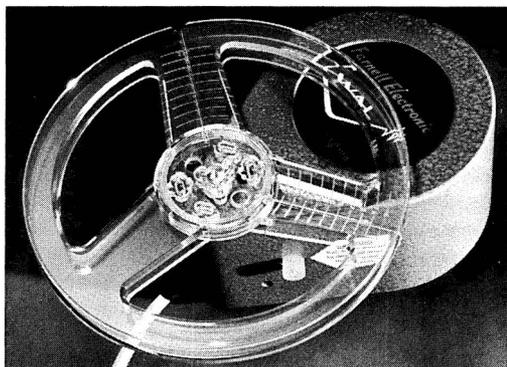
#### OPERATION DETAILS

When erasing tape, just place the reel on the mounting pin, press switch and rotate reel in any direction about 10 revolutions at about 60 r.p.m. Remove tape and switch off only when tape is well clear of the eraser head.

Three positions are provided for reel mounting pin to ensure optimum positioning in magnetic field for 8½" or 10" reels.

In severe cases of over-modulation, 2 pin positions can be used consecutively.

Recommended Retail Price £11.27 inc. P/T.



## TUDOR MAGNETIC RECORDING TAPE

Superb quality for 2 & 4 track recordings

Sizes	Type	Footage
3"	STANDARD	150'
3"	LONGPLAY	250'
5"	STANDARD	600'
5"	LONGPLAY	900'
5"	TRIPLEPLAY	1200'
5½"	LONGPLAY	1200'
5½"	DOUBLEPLAY	1800'
7"	LONGPLAY	1800'
7"	DOUBLEPLAY	2400'

In colour coded boxes for your easy selection



A. C. FARNELL LTD

Farnell House,  
81 Kirkstall Road,  
LEEDS 3.

Tel: Leeds 35111 (10 lines)

Telex: 55147

A. C. FARNELL (LONDON) LTD

25A Hermitage Road,  
LONDON N.4.

Tel: 01-802 4181

A. C. FARNELL (SHEFFIELD) LTD

Kenyon Street,  
SHEFFIELD 1.

Tel: 78901 (7 lines)

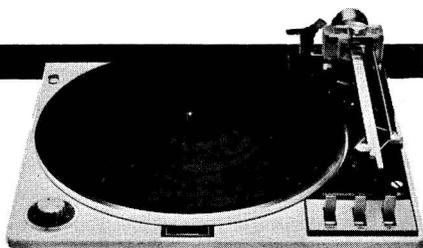
# The finest start to your hi-fi system

Four Garrard decks. All different, but all the same when it comes to quality, reliability and value for money. See them and the other models in the Garrard range at your Hi-Fi dealer.

## Garrard Zero-100

The new Zero-100 offers the greatest combination of advanced features available in any turntable today. It is a two speed (45 and 33 $\frac{1}{3}$ ) automatic transcription unit which incorporates an ingenious pickup arm design that virtually eliminates tracking error.

Features include magnetic bias compensation, illuminated strobe and fine speed control, stylus force adjustment from 0-3 grammes and an adjustable cartridge carrier for optimum vertical tracking angle.

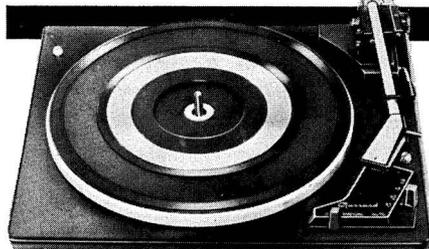
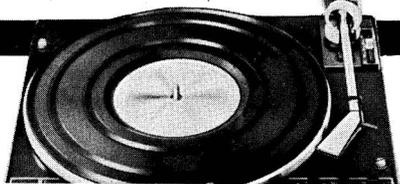


## Garrard 401

With its heavily-shielded 4-pole induction motor, precise speed control, non-magnetic diecast turntable, built-in stroboscopic light and elegant styling, the 401 is the ultimate in transcription turntables. It meets the most exacting requirements of radio, television and recording studios throughout the world and of hi-fi enthusiasts everywhere. Each unit is supplied with its own individual test report.

## Garrard AP76

A transcription quality three-speed (78, 45 and 33 $\frac{1}{3}$ ) single record playing unit, which features automatic play of single records when required. The tubular pickup arm, fitted with a slide-in cartridge carrier is counter balanced by decoupled weight, and incorporates a bias compensator (calibrated for spherical and elliptical styli) and fine stylus force adjustment. Other features include non-magnetic turntable, fluid-damped cue and pause facility and tab controls. Optional extras: Wood base and rigid clear plastic cover.



## Garrard SP25 MK III

The successor to the SP25 MK II, probably the most popular single record playing unit in the moderate price range. Features include non-magnetic turntable, calibrated fine stylus force adjustment, bias compensator, viscous damped cue and pause facility, decoupled weight counter balanced pickup arm with slide-in cartridge carrier. Plays single records automatically when required. Optional extras: Wood base and rigid plastic cover.



Garrard, Newcastle Street,  
Swindon, Wiltshire.  
Telephone: Swindon 5381

**Garrard**  
A PLESSEY QUALITY PRODUCT

# Directory of Motor Units

★ Indicates entry is illustrated.

Abbreviations used in this section are given on page 46.

## ■ ACOUSTIC RESEARCH

Distributors: Bell & Howell Ltd, Audio Products Division, Alpertown House, Bridgewater Road, Alpertown, Middlesex, HAO1EG.

Tel: 01-902 8812. Telex: 261378.

### AR Universal ★

Two-speed turntable, pickup arm, plug-in cartridge shell, plinth and transparent plastic cover. Speeds: 33½ and 45rpm. W and F: <0.1% (combined wow and flutter measured to NAB standards). Rumble: at least 35dB below 1cm/second (measured to NAB standards). Speed accuracy: ±0.3% of absolute speed. Turntable: 12in non-magnetic. Belt drive. Miniature synchronous motor. Adjustable playing weight. Internal adjustable viscous damping. Decoupled turntable isolated from plinth. Adjustable stylus pressure with built-in gauge. Finish: walnut. Performance guaranteed to exceed NAB broadcast equipment standard for three years after purchase. Price: £61.08½ (plus £16.37 PT).

## ■ BANG AND OLUFSEN UK LTD

Eastbrook Road, Gloucester, GL47DE.

Tel: Gloucester 21591.

### Beogram 1000LM

Plinth mounted motor unit with arm and SP14A magnetic cartridge. Speeds: 78, 45 and 33½rpm with 12% vernier adjustment. Wow: ±0.2% peak. Rumble >32dB below 10cm/sec PU output. Belt drive. B and OST/L 15° arm with micro-lift. Anti-static mat with strobe disc. Anti-microphonic suspension. Built-in 45rpm disc insert. Power supply and socket for GF3 preamp. Price (teak): £46.90 (including PT); (rosewood) £47.90 (including PT). GF3 preamplifier to slot into socket under Beogram 1000. Price: £7.50 (no PT).

## ■ BSR McDONALD

(McDonald Division) BSR Ltd, Cradley Heath, Warley, Worcs. Tel: Cradley Heath 69272.

### HT70 ★

Four-speed single player. Wow: <0.2% RMS

(0.4% peak). Flutter: 0.06%. Rumble -35dB to DIN 45-500 specification. Speed constant down to 16% reduction in mains voltage. Turntable: 11in diameter diecast alloy weighing 5lb. Pulley drive. Synchronous dynamically balanced four-pole motor. Double ballrace mounted pickup arm. Plug-in head. Counter-balanced arm. Bias compensator. Tracking control. Viscous damped cue control. Anti-skate device. Muting switch. Adjustment for playing weight. Rotating record stub spindle to combat drag. Price: £17.72 (plus £4.27 PT).

### MP60

Four-speed single player. Wow: <0.2% RMS (0.4% peak). Flutter: 0.06%. Rumble: -35dB to DIN 45-500 spec. Speed constant down to 16% reduction in mains volts. 11in diecast turntable. Pulley drive. Four-pole motor. Double ball-race mounted pickup arm. Plug-in head. Counterbalanced. Bias compensator. Tracking control. Viscous damped cue control. Anti-skate device. Muting switch. Price: £12.69 (plus £3.06 PT).

### 610

Automatic four-speed changer. Wow: <0.2% RMS (0.4% peak). Flutter: 0.06%. Rumble: -29dB ref 1kHz recorded laterally at 1.2cm/sec. Speed constant down to 16% reduction in mains voltage. 11in diecast turntable. Pulley drive. Synchronous motor. Double ballrace pickup mounting. Anti-skate device. Counter-balanced. Plug-in head. Viscous damped cue control. Muting switch. Price: £16.10 (plus £3.90).

### 510 ★

Automatic four-speed changer. Wow: <0.2%. Flutter: 0.06%. Rumble: -29dB ref 1kHz recorded laterally at 1.2cm/sec. Speed constant down to 16% reduction in mains volts. 11in pressed steel turntable. Pulley drive. Synchronous motor. Counterbalanced arm. Plug-in head. Double ball-race mounting. Viscous damped cue control. Anti-skate device. Muting switch. Swing-away record control arm to facilitate single play. Price: £13.68 (plus £3.32 PT).

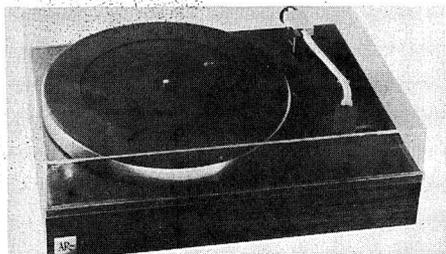
All BSR McDonald record units are also available on plinth with clear plastic cover and ready wired. Details on request.

## ■ CONNOISSEUR

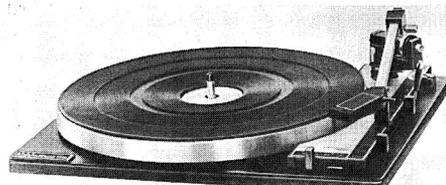
A. R. Sugden & Co (Engineers) Ltd, Market Street, Brighouse, Yorkshire. Tel: Brighouse 2142. Cables: Connoisseur, Brighouse.

### BD1 ★

Two-speed motor unit supplied as motor only or plinth mounted with any Connoisseur arm. Two fixed speeds, 33½ and 45 rpm. Wow: <0.1%. Flutter: <0.1%. Rumble: -50dB measured at



Acoustic Research Turntable



BSR McDonald HT70



BSR McDonald 510



Connoisseur BD1



Connoisseur BD2

RIAA characteristics ref 7cm/sec at 1kHz. No change in speed for 20% variation in supply voltage. 10½in non-ferrous lathe-turned turntable. Precision ground belt drive. Unique drive arrangement eliminates transmission noise. Simple manual speed change. Low hum field. Slim line construction. Only 1½in required below mounting platform. Mains: 100-120V and 200-240V, 50 or 60Hz. Price: £13.40 (plus £3.15 PT). Price of assemblies on application.

**BD2 ★**

Integrated transcription unit. Includes a BD1 motor unit (mounted on a larger platform) and a type SAU2 pickup arm. Hydraulic arm lift operated from front. Anti-vibration springs. Supplied either chassis only or plinth mounted. Perspex cover optional. Size: 12½ × 14 × 4½in (2in below and 2½in above the platform). Price: (chassis model) £23.35 (plus £5.96 PT); (assembly mounted on plinth complete with transparent plastic cover) £32.40 (plus £7.62 PT).

**■ DECCA**

Decca Special Products, Ingate Place, Queenstown Road, London, SW8. Tel: 01-622 6677.

**Studio turntable ★**

Combination of Decca Mk 4 ffs cartridge and Garrard AP75 three-speed single record playing unit. Speed 33½, 45 and 78rpm. Automatic motor switch off and return of pickup at end of record. Cue and pause facility, calibrated pickup arm bias compensation, calibrated stylus weight adjustment. Price: £32.30 (plus £7.60 PT).

**■ DUAL ELECTRONICS LTD**

St Georgen House, Mill Road, Stokenchurch, High Wycombe, Bucks. Tel: Radnage 3467/8.

**1214**

Three-speed turntable with pickup arm and cartridge. Manual or semi-automatic operation. Counter-balanced tubular pickup arm. Fine speed control. Silicon damped cueing device. Jam-proof controls. Specification exceeds in all respects requirements of DIN 45 500. Shure M75D magnetic cartridge. Headshell accepts all cartridges with ½in fixing centres. Speed control provides approx one semitone variation. Speeds: 33½, 45, 78rpm. Four-pole asynchronous motor with radially elastic suspension. Turntable: 10½in diameter, 3¼lb. Mains: 110/117, 220/240 50/60Hz. Consumption: 10W. Rumble: (weighted) > -55dB. Size: (chassis) 13 × 11in. Base type CK6. Cover type CK6 or CK20. Price: (chassis plus cartridge) £42 (plus £8 PT).

**1215**

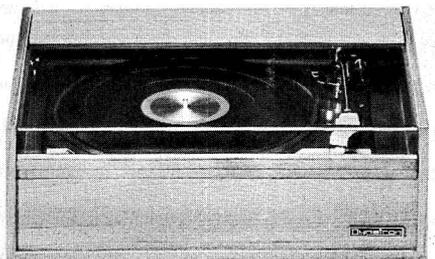
Three-speed turntable with pickup arm and cartridge. Manual, semi-automatic or fully auto-



Decca Studio



Dual 1219



Dynatron P100 teak

matic operation. Featherlight controls. Speed control provides variation of approximately one semitone. Clip-in headshell. Damped cueing control. Anti-skating device coupled to tracking weight control. New design lightweight cast alloy pickup arm with decoupled counterweight assembly. Playing weight adjustable 1-8gm. Headshell accepts all cartridges with  $\frac{1}{2}$ in fixing centres. Speeds: 33 $\frac{1}{3}$ , 45, 78rpm. Four-pole asynchronous motor with radially elastic suspension. Turntable: 10 $\frac{1}{2}$ in diameter, 4 $\frac{1}{2}$ lb, non-magnetic. Rumble: > -57dB (weighted). Mains: 110/117, 220/240V 50/60Hz. Consumption: 10W. Size: (chassis) 13 x 11in. Base type: CK6. Cover type: CK6 or CK20. Price: (chassis plus cartridge) £46-47 (plus £8-85 PT).

**1218**

Three-speed turntable with pickup arm and cartridge. New design pickup based on the 1219 arm. Tubular aluminium arm supported at the rear in four micro-races set in a two-ring gimbal system. Headshell incorporates mechanism, operated by small side knob, which tilts cartridge to compensate tracking angle when playing a stack of discs. Anti-skating adjustment, calibrated for spherical or elliptical stylus. Speed control provides variation of approximately one semitone. Speeds: 33 $\frac{1}{3}$ , 45, 78rpm. Four-pole synchronous motor with ferrite ring rotor and suspension by radially elastic supports. Mains: 110/117, 220/240V 50/60Hz. Consumption: 10W. Turntable: 10 $\frac{1}{2}$ in diameter, 4 $\frac{1}{2}$ lb, non-magnetic. Rumble: (weighted) > -59dB. Size: (chassis) 13 x 11in. Base type: CK6. Cover type: CK6 or CK20. Price: (chassis plus cartridge) £65-96 (plus £12-56 PT).

**1219 ★**

Three-speed turntable with pickup arm and cartridge. 12in diecast turntable. Extra long lightweight tubular aluminium pickup arm. Effective pivot to stylus tip length 8 $\frac{3}{4}$ in. Maximum tracking error over record diameter of 4 $\frac{1}{2}$ -11 $\frac{1}{2}$ in is 1 $\frac{1}{2}$ deg. Speed control giving variation of approximately one semitone. Cueing device damped on lowering and raising. Adjustment for playing single records or a stack to keep tracking angle correct. Accepts all standard  $\frac{1}{2}$ in fixing centre cartridges. Speeds: 33 $\frac{1}{3}$ , 45, 78rpm. Built-in stroboscope. Four-pole synchronous motor with ferrite ring rotor and suspension by radially elastic supports. Mains: 110/117V, 220/240V 50/60Hz. Consumption: 8W. Turntable weight: 7lb approx. Rumble: (weighted) -60dB (DIN). W and F: 0-06% or less (DIN 45 507). Cartridge: Shure M91MG-D, or DM101MG, or DM103ME. Size: 14 $\frac{3}{4}$  x 13 $\frac{1}{2}$ in. Price: (chassis plus M91 cartridge) £77-37 (plus £14-73 PT); (chassis plus DM101 cartridge) £81-90 (plus £15-60 PT); (chassis plus DM103 cartridge) £85-44 (plus £16-27 PT).

**■ DYNATRON RADIO LTD**

St Peter's Road, Furze Platt, Maidenhead, Berks. Tel: Maidenhead 23331.

**Dynatron P.100 Teak ★**

Plinth unit comprising Goldring-Lenco GL75 mechanism with Goldring G800 cartridge. Four speeds, fully variable. Fitted with mains lead and plug, also audio lead and DIN plug. Price: £47-75 (plus £11-25 PT).

**■ EMT WILHELM FRANZ KG**

Sole UK agents: F. W. O. Bauch Ltd, 49 Theobald Street, Boreham Wood, Herts. Tel: 01-953 0091.

★ Indicates entry is illustrated

### EMT 930st ★

Professional transcription turntable fitted with pickup arm and equaliser amplifier, chassis construction. Speeds: 33 $\frac{1}{3}$ , 45 and 78rpm with fine speed control. W and F max: 0.075%. Rumble: referred to a peak velocity  $V=10\text{cm/s}$  at 1kHz 58dB (weighted) (0dB=0.775V). Speed constancy: max  $\pm 0.15\%$ . Turntable: 13in dia heavy cast non-magnetic with light perspex auxiliary turntable on top. Drive: pulley. Motor: EMT manufacture with artificially aged shaft. Pickup arm: S-shaped Ortofon Type RMA 229. Features: stroboscope, quick start, remote start, pickup illumination, scratch filter and equalisation control on deck, headphone sockets, pickup lowering device. Price on application.



EMT 930st

### ■ GARRARD ENGINEERING LTD

Swindon, Wiltshire, England.

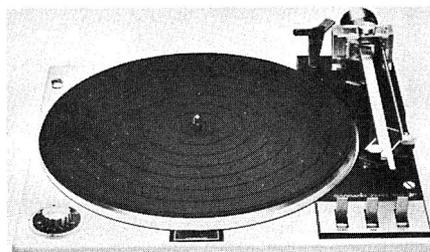
Tel: Swindon 5381. Cables: Garrard, Swindon.

### Zero 100★

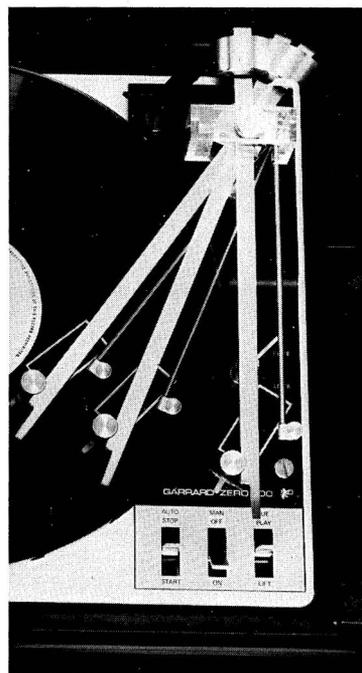
Two-speed transcription record unit with tangential pickup arm. Speeds: 33 $\frac{1}{3}$  and 45rpm. Fine speed adjustment giving  $\pm 3\%$ . Stroboscopic neon speed indicator. W and F: better than 0.1% RMS. Rumble: better than -51dB relative to 1.4cm/sec at 100Hz. Garrard Synchro-Lab two-section motor. Tangential pickup head incorporating an automatic pivoting device that keeps the cartridge in precisely the correct attitude and so virtually eliminates tracking error. Stylus angle adjustable for single records or for playing a number of discs on automatic. Provided with gauge for exact positioning of cartridge in head. Magnetic bias compensation calibrated for spherical and elliptical stylus. Adjustable playing weight calibrated in  $\frac{1}{4}\text{gm}$  steps from 0.3gm over 3in. Non-magnetic 11 $\frac{1}{2}$ in turntable. Pulley drive. Three brass tab keys for controls. Functions provide automatic operation, manual operation, cue, pause and stop. Fluid damped lowering device. Price: (approximate) £55 including PT.

### Model 401

Transcription motor. Three speeds: 33 $\frac{1}{3}$ , 45, 78rpm. Adjustable by eddy current brake. 6lb machined aluminium turntable with gear-cut illuminated strobe markings on rim. Statically balanced. Die-cast aluminium unit plate. Completely screened spring-mounted shaded-pole motor. Styled by Eric Marshall and finished in metallic charcoal with chrome relief. W. and F. less than 0.05% RMS. Rumble almost non-existent. Mains: 110-125V and 220-250V, 50 or 60Hz according to pulley fitted. Size: 13 $\frac{1}{2}$ in wide, 14 $\frac{1}{2}$ in front to rear, 2 $\frac{1}{2}$ in above and 3 $\frac{1}{2}$ in below lower edge of unit plate. Price: £30.58 (plus £7.48 PT).



Garrard Zero 100



Garrard Zero 100 Pickup arm

**SP25 Mk III ★**

High quality single record playing unit with performance to DIN 45-500. Non-magnetic turntable. Three-speed. Four-pole screened motor. Cueing device to raise or lower pickup arm where required. Counter-balanced tubular aluminium arm. Slide-in cartridge carrier. Integral calibrated stylus pressure adjustment. Bias compensator. Automatic play of single records. Wired for stereo and mono. Mains: 100-125V, 220-250V, 50 or 60Hz according to pulley. Size:  $15\frac{1}{8}$ in wide,  $12\frac{1}{2}$ in front to rear,  $2\frac{7}{8}$ in above,  $2\frac{1}{2}$ in below lower edge of unit plate. Plus clearances. Price: £13-21 (plus £3-23 PT).

**WB1**

Wood base for SP25 Mk II. Price: £3-09 (plus 76p PT).

**SPC1**

Rigid transparent plastic dust cover for WB1. Price: £3 (plus 87p PT).

**SL95B**

Transcription turntable with autochange facility and automatic single record play. Combined record size and speed selector.  $11\frac{1}{2}$ in aluminium turntable. Weight-counterbalanced wood and aluminium pickup arm with gimbal type pivots. Calibrated fine stylus force adjustment. Calibrated bias compensator. Slide-in cartridge carrier accepts most makes and types. Cue and pause facility. Wired for mono and stereo. Synchro-Lab constant speed motor. Size (including rear and side overhang of pickup arm):  $15\frac{7}{8}$ in wide,  $14\frac{1}{2}$ in front to rear,  $4\frac{1}{2}$ in above,  $2\frac{1}{8}$ in below lower edge of unit plate. Plus clearances. Price: £40-19 (plus £9-82 PT).

**WB4 Mk II**

Wood base for SL95B. Price: £4-57 (plus £1-12 PT).

**SPC4 Mk II**

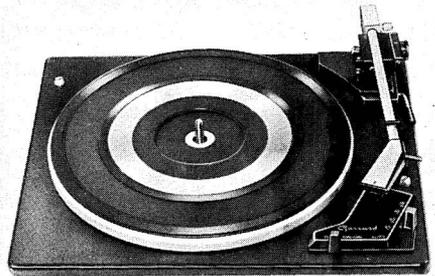
Rigid transparent plastic dust cover for SL95B. Price: £3-56 (plus 87p PT).

**SL75B**

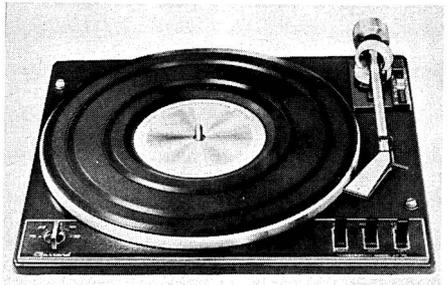
Transcription turntable with autochange facility and automatic single record play. Combined record size and speed selector.  $11\frac{1}{2}$ in diameter aluminium turntable. Diecast aluminium pickup arm. Counterbalanced. Calibrated fine stylus force adjustment. Calibrated bias compensator. Slide-in cartridge carrier accepts most makes and types. Cue and pause facility. Wired for stereo and mono. Synchro-Lab constant speed motor. Size (including rear and side overhang of pickup arm):  $15\frac{9}{16}$ in wide,  $14\frac{1}{16}$ in front to rear,  $4\frac{1}{2}$ in above,  $2\frac{1}{8}$ in below lower edge of unit plate. Plus clearances. Price: £31-50 (plus £7-70 PT).

**WB4 Mk II**

Wood base for SL75B. Price: £4-57 (plus £1-12 PT)



Garrard SP25 Mk III



Garrard AP76

**SPC4 Mk II**

Rigid transparent plastic cover for SL75B. Price: £3-56 (plus 87p PT).

**SL72B**

Transcription turntable with autochange facility and automatic single record play. Combined record size and speed selector. Non-magnetic turntable. Aluminium pickup arm is weight counterbalanced, fitted with slide-in cartridge carrier and features gimbal type pivots. Calibrated stylus force adjustment. Calibrated bias compensator. Cue and pause facility. Wired for stereo and mono. Size (including rear and side overhang of pickup arm):  $14\frac{1}{8}$ in wide,  $12\frac{1}{2}$ in front to rear,  $4\frac{1}{8}$ in above and  $2\frac{1}{8}$ in below lower edge of unit plate, plus clearances. Price: £26-61 (plus £6-50 PT).

**WB4 Mk II**

Wood base for SL72B. Price: £4-57 (plus £1-12 PT).

**SPC4 Mk II**

Rigid plastic cover for SL72B. Price: £3-56 (plus 87p PT).

**AP76 ★**

Single record playing unit complying with DIN 45-500 standards. Manual or automatic play of single records. Combined record size and speed selector.  $11\frac{1}{2}$ in diameter aluminium turntable.

★ Indicates entry is illustrated

Aluminium pickup arm. Counter-balanced. Calibrated fine stylus force adjustment. Calibrated bias compensator. Slide-in cartridge carrier accepts most makes and types. Cue and pause facility. Wired for stereo and mono. Four-pole induction motor. Size (including rear and side overhang of pickup arm):  $14\frac{1}{8}$ in wide,  $12\frac{1}{8}$ in front to rear,  $2\frac{3}{8}$ in above,  $2\frac{1}{8}$ in below edge of unit plate. Plus clearances. Price: £23.21 (plus £5.67 PT).

#### WB4 Mk II

Teak finish wood base for AP76. Price: £4.57 (plus £1.12 PT).

### ■ GOLDRING MANUFACTURING CO (Great Britain) LTD

10 Bayford Street, Hackney, London, E83SE.  
Tel: 01-985 1152.

#### Goldring-Lenco GL75 ★

Integrated turntable and pickup arm. Four speeds, infinitely variable. Wow:  $<0.2\%$ . Flutter:  $<0.2\%$ . Speed change less than  $1\%$  for  $13\%$  voltage change. 12in diameter diecast zinc turntable, 8lb. Vertical pulley drive. Four-pole 15W induction motor. L75 pickup arm. Counter-balance weight adjustment, knife-edge bearing, plug-in shell. Hydraulic lowering device. Price: £31.50 (plus £7.50 PT). Available on plinth as GL75/P. Price: £38.50 (plus £9.17 PT).

#### Goldring G99 ★

Transcription motor only. Infinitely variable speeds 30-80rpm. Wow  $0.1\%$ . Speed remains constant with  $13\%$  voltage change. Turntable 12in die-cast zinc. Vertical idler wheel with provision for disengagement. Four-pole motor. Built-in illuminated strobe. Pushbutton on-off. Price: £21 (plus £5 PT).

#### Goldring-Lenco GL69 Mk II

Integrated turntable unit complete with pickup arm. Available also mounted on plinth as GL69/P. Infinitely variable speed adjustment with click-in positions for  $16\frac{2}{3}$ ,  $33\frac{1}{3}$ , 45 and 78 rpm. Wow and flutter:  $0.12\%$ . Speed constancy:  $0.3\%$  for a  $10\%$  change in voltage. Turntable: 12in pressed steel, weight 3lb. Drive: vertical pulley, running on conical motor spindle. Motor: induction 15VA. Pickup arm: L69, sliding counter-weight stylus pressure adjustment, knife-edge bearings, lightweight pickup headshell with adjustment for stylus position. Price: £21.50 (plus £5.12 PT). Price of GL69/P Mk II £28.50 (plus £6.79 PT). Plastic dust cover, price: £3.50 (plus 83p PT).

### ■ JAPAN PHONO MOTOR CO LTD

Distributors: Howland-West Ltd, 2 Park End, South Hill Park, London, NW3.  
Tel: 01-794 6666 and 6033.



Goldring GL75/P



Goldring G99



JP TP-601



Micro-Seiki MR-111

**JP TP-601 ★**

Turntable with pickup arm. Plinth and cover available as extras. Speeds: 33 $\frac{1}{3}$  and 45rpm. Wow: <0.1%. Rumble: <40dB. Turntable: 12in diecast aluminium, approximately 3 $\frac{1}{2}$ lb. Belt drive. Four-pole synchronous motor. Lightweight pickup arm with damped lowering device. Plinth fitted with Bulgin mains plug and socket, colour-coded phono plugs and sockets for PU. Price: (motor and pickup unit) £34.50 (plus £8.01 PT); (plinth) £10 (plus £2.44 PT).

**■ MICRO-SEIKI**

Distributors: B. H. Morris & Co (Radio) Ltd, 84-88 Nelson Street, London, E1 2DY. Tel: 01-790 4824.

**MR-111 ★**

Turntable, arm and cartridge. Speeds: 33 $\frac{1}{3}$ , 45rpm. Belt drive from four-pole synchronous motor. Auto stop. Static balance type tubular arm with anti-skate device. Oil-damped lifter. Direct-reading stylus pressure adjuster. Revolving type counterweight. Accepts 4-8gm cartridges. Fitted with Micro Trace cartridge M-2100/7 with 8mV output. Weight: 10lb. Dimensions: 15 $\frac{1}{4}$  × 12 $\frac{1}{8}$  × 5 $\frac{3}{8}$ in. Price: (unit only) £40 (including PT); (teak plinth and transparent plastic dust cover) £9.95 extra (including PT).

**MR-211**

Turntable, arm and cartridge. Silver-finish turntable board on oil-finished walnut plinth. Speeds: 33 $\frac{1}{3}$ , 45rpm. Belt drive from heavy-duty four-pole hysteresis motor. Static balance type S-shape arm with spring-type anti-skate device with adjustable bias cancel force. Micro Trace cartridge tracks at  $\frac{3}{4}$ -4gm. Weight: 16lb. Dimensions: 17 $\frac{5}{8}$  × 13 $\frac{1}{4}$  × 6 $\frac{3}{8}$ in. Price: (with plinth and cover) £72 (including PT).

**■ NIVICO**

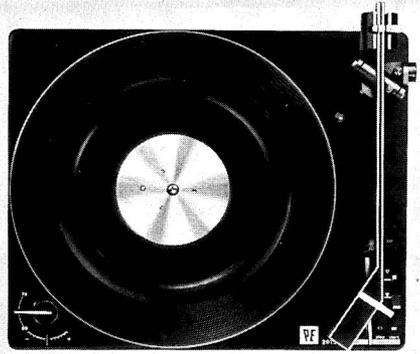
Denham & Morley Ltd, Denmore House, 453 Caledonian Road, London, N7. Tel: 01-607 6568. Telex: 24562.

**5220**

Two-speed turntable with pickup arm and cartridge mounted in plinth with transparent cover. Belt-drive. Four-pole synchronous motor. 12in diecast aluminium turntable. Weight: 3 $\frac{1}{2}$ lb. Automatic cut-off and arm return. Magnetic cartridge. Compliance: 20 × 10<sup>-6</sup>cm/dyne. FR: 20Hz-20kHz. Output: 3mV. Pw: 3 $\frac{1}{2}$ -4 $\frac{1}{2}$ gm. W and F: <0.1% RMS. Counterbalanced arm with anti-skating device. Finish: walnut. Size: 19 $\frac{1}{4}$  × 15 $\frac{1}{2}$  × 7 $\frac{1}{4}$ in. Weight: 19.8lb. Price: £75.57 (including PT).

**5240B**

Two-speed turntable with pickup arm and cartridge mounted in plinth with transparent cover.



*Perpetuum-Ebner 2015*

Belt drive. Four-pole synchronous motor. 12in diecast aluminium turntable. Automatic cut-off and arm return. W and F: 0.08%. S/N: >60dB. Tubular counterbalanced arm with bias compensation. Hydraulic lowering device. Induced magnet cartridge. Output: 3mV. FR: 20Hz-20kHz. Compliance: 25 × 10<sup>-6</sup>cm/dyne. Pw: 3gm. Finish: walnut. Size: 19 $\frac{1}{4}$  × 15 $\frac{1}{2}$  × 7 $\frac{1}{4}$ in. Weight: 21lb. Price: £99.75 (including PT).

**SRP-471E-5**

Three-speed turntable unit with pickup arm and cartridge in plinth with transparent cover. Six-pole outer rotor motor. 11in turntable. Speeds: 16, 33 $\frac{1}{3}$ , 45rpm. W and F: <0.1%. S/N: better than 50dB. Lightweight tubular arm. Moving magnet cartridge. Output: 5mV. FR: 20Hz-20kHz ± 2dB. Pw: 3gm. Automatic cut-off and return of arm. Size: 19 $\frac{1}{2}$  × 15 $\frac{1}{2}$  × 7 $\frac{1}{4}$ in. Weight: 22lb. Price: to be announced.

**■ PERPETUUM-EBNER**

Highgate Acoustics Ltd, 184-188 Great Portland Street, London, W1. Tel: 01-636 2901 (4 lines).

**PE 2015 ★**

Motor unit with base, dust cover and pickup arm (less cartridge). Speeds: 33 $\frac{1}{3}$ , 45 and 78rpm with fine speed adjustment. Wow: <0.15%. Flutter: <0.15%. Rumble: >-56dB at 10cm/sec and 1kHz. Turntable: 10 $\frac{3}{8}$ in cast aluminium weighing approximately 4 $\frac{1}{2}$ lb. Pulley drive. Four-pole synchronous motor. Tubular lightweight pickup arm mounted on low-friction ball bearings. Price: £36.95 (plus £8.05 PT).

**PE 2016**

Motor unit with base, dust cover and pickup arm (less cartridge). Speeds: 33 $\frac{1}{3}$ , 45, 78rpm with ±3% fine speed adjustment. Wow: <0.15%. Flutter: <0.15%. Rumble: >-56dB

★ Indicates entry is illustrated

at 10cm/sec and 1kHz. Turntable: 10 $\frac{3}{4}$ in. approx. cast aluminium weighing approx. 4 $\frac{1}{2}$ lb. Pulley drive. Four-pole synchronous motor. Tubular lightweight pickup arm mounted on low-friction ball bearings. Price: £40.65 (plus £8.85 PT).

#### PE 2018

Motor unit with base, dust cover and pickup arm (less cartridge). Speeds: 33 $\frac{1}{3}$ , 45, 78rpm with  $\pm 3\%$  fine speed adjustment. Wow: <0.15%. Flutter: <0.15%. Rumble: > -56dB at 10cm/sec and 1kHz. Turntable: 10 $\frac{3}{4}$ in approx. cast aluminium weighing approx. 4 $\frac{1}{2}$ lb. Pulley drive. Four-pole synchronous motor. Tubular lightweight pickup arm mounted on low-friction bearings. Price: £45.57 $\frac{1}{2}$  (plus £9.92 $\frac{1}{2}$  PT).

#### PE 2020

Motor unit with base, dust cover and pickup arm (less cartridge). Speeds: 33 $\frac{1}{3}$ , 45, 78rpm with  $\pm 3\%$  fine speed adjustment. Wow: <0.1%. Flutter: <0.1%. Rumble: > -58dB at 10cm/sec and 1kHz. Turntable: 11 $\frac{1}{2}$ in approx. cast aluminium weighing approx. 7lb. Pulley drive: Four-pole synchronous motor. Tubular lightweight pickup arm mounted on low-friction ball bearings. Price: £53.38 (plus £11.62 PT).

#### ■ PHILCO-FORD

Philco International Ltd,  
42 Leicester Square, London, WC2H 7LR.  
Tel: 01-930 7667.

#### 1660

Garrard single-play deck in white satin finish shelf-mounting case with tinted plastic dust cover. 10 $\frac{1}{2}$ in turntable. Counterbalanced pickup arm. Bias compensation. Integral calibrated stylus pressure adjustment. High compliance stereo magnetic cartridge. AC mains 220-240V 50Hz. Size: 16 $\frac{1}{8}$   $\times$  7 $\frac{1}{8}$   $\times$  15 $\frac{1}{4}$ in. Connecting leads: 7ft mains lead, 5ft audio output with DIN plug. Price: £31.95 (including PT).

#### ■ PHILIPS ELECTRICAL LTD

Century House, Shaftesbury Avenue,  
London, WC2. Tel: 01-437 7777.

#### GA105

Player complete with arm, plinth, ceramic cartridge and with Perspex cover. Speeds: 33 $\frac{1}{3}$ , 45 and 78rpm. W and F: <0.25%. Rumble: < -52 dB (DIN 'B'). Turntable: 8 $\frac{3}{4}$ in. Drive: via rubber idler wheel. Tubular aluminium arm, direct-reading playing-weight adjustment, damped pickup lowering device and auto switch-off for all sizes of record including 4in. Mains: 110-127V, 220-240V AC. Price: £20 (inc. PT).

#### GA202

Transcription unit with arm, pickup, plinth (teak veneered) and lid. Speeds: 33 $\frac{1}{3}$ , 45 and 78



Philips GA160



Philips GA308

rpm with individual fine control  $\pm 2\%$ . W and F <0.13% (DIN). Rumble: < -60dB (DIN 'B'). Electronic control maintains speed over normal mains voltage variations. Long-term drift better than  $\pm 0.2\%$ . Turntable: 11 $\frac{1}{2}$ in steel, 2 $\frac{1}{2}$ lb. Electronic control obviates need for large flywheel. Drive: two-stage belt drive. DC motor with transistor regulator circuit. Pickup arm: lightweight tubular, gimbal mounted, decoupled counterweight, stylus pressure and side thrust adjustment. Standard  $\frac{1}{2}$ in head shell with slide-in cartridge carrier. Full electronic control for start, stop and speed control. Light beam operated autostop. Supplied complete with GP400 magneto-dynamic cartridge. Viscous damped pickup manipulator (cueing device). Price: £69 (inc. PT).

#### GA160 ★

Single-play record deck with autochange facility. Complete with pickup arm and cartridge on teak veneered plinth with Perspex dust cover. Speeds: 16 $\frac{2}{3}$ , 33 $\frac{1}{3}$ , 45, 78rpm. Maximum loading: 7 records. W and F: <0.2%. Rumble: -55dB (DIN). Turntable: 9 $\frac{1}{2}$ in. Size: 14 $\frac{1}{2}$   $\times$  12 $\frac{1}{2}$   $\times$  6in.

Mains: 110, 120, 220, 240V 50Hz. Short single-play centre spindle supplied. Price: £35 (inc. PT).

#### GA308 ★

Transcription motor unit with arm and headshell on teak veneered plinth with hinged cover. Slide-in cartridge carrier. Speeds: 33 $\frac{1}{3}$ , 45rpm. W and F: <0.2%. Rumble: <-55dB (DIN). Pickup arm friction: lateral <0.1gm, vertical <0.15gm (measured at stylus tip). Tracking error: <0' 8"/cm. Turntable: 10 $\frac{1}{4}$ in steel. Low speed synchronous motor. Adjustable bias compensation for spherical and elliptical stylus. Calibrated playing weight adjustment. Automatic lift-off and switch-off at end of record. Mains: 110, 120, 220, 240V 50Hz. Consumption: 1.7W. Size: 14 $\frac{1}{2}$  × 12 $\frac{1}{2}$  × 5 $\frac{1}{2}$ in. Price: £39 (inc. PT).

#### ■ PIONEER

Distributors: Shriro (UK) Ltd,  
42 Russell Square, London, WC1B 5DF.  
Tel: 01-580 6996.

#### PL12AC

Two-speed record deck with pickup arm on plinth with cover. Speeds: 33 $\frac{1}{3}$  and 45rpm. Wow: <0.12%. Flutter: <0.12%. S/N ratio better than 45dB. 12in aluminium turntable. Belt drive. Four-pole synchronous motor. Static balanced pickup arm, incorporating bias compensation and hydraulic lift device. Price: £41.20 (plus £8.73 PT).

#### PL15

Two-speed record deck with pickup arm on plinth with cover. Speeds: 33 $\frac{1}{3}$  and 45rpm. W and F: <0.1%. S/N ratio better than 47dB. 12in diecast aluminium turntable. Belt drive. Four-pole synchronous motor. Static balanced arm incorporating automatic return, bias compensation, hydraulic lift and direct weight calibration. Price: £57.52 (plus £12.18 PT).

#### PL25

Two-speed record deck with pickup arm and cartridge mounted on plinth with cover. Speeds: 33 $\frac{1}{3}$  and 45rpm. W and F: <0.1%. S/N ratio better than 46dB. 12in diecast aluminium turntable. Belt drive. Four-pole synchronous motor. Static balanced pickup arm incorporating bias compensation, automatic cue-in and return, hydraulic lift device and adjustable weight. Price: £73.94 (plus £15.66 PT).

#### PL31D

Two-speed record deck with pickup arm and cartridge mounted on plinth with cover. Speeds: 33 $\frac{1}{3}$  and 45rpm. W and F: <0.1%. S/N ratio better than 50dB. 12in diecast aluminium turntable. Belt drive. Four-pole synchronous motor. Static balanced tubular pickup arm incorporating calibrated weight adjustment, overhang indicator, hydraulic lift device, magnetic bias

compensation and lateral balance. Price: £91.13 (plus £19.30 PT).

#### PL41A

Two-speed record deck with pickup arm and cartridge mounted on plinth with cover. Speeds: 33 $\frac{1}{3}$  and 45rpm. W and F: <0.08%. S/N ratio better than 50dB. 12in diecast aluminium turntable. Belt drive. Four-pole synchronous motor. Static balanced pickup arm incorporating bias compensation, lateral balance, calibrated weight adjustment and hydraulic lift device. Price: £114.27 (plus £24.20 PT).

#### PL50

Two-speed record deck with pickup arm and cartridge mounted on plinth with cover. Speeds: 33 $\frac{1}{3}$  and 45rpm. W and F: <0.08%. S/N ratio better than 50dB. 12in diecast aluminium turntable. Belt drive. Four-pole synchronous motor. Static balanced arm incorporating magnetic bias compensation, lateral balance, automatic return and calibrated weight adjustment. Price: £115.22 (plus £24.40 PT).

#### ■ RADON

Radon Industrial Electronics Co Ltd,  
Orme Road, Worthing, Sussex.  
Tel: Worthing 34904.

#### RP60

Record deck in plinth cabinet with lift off lid. Designed for use with Radon System 60 amplifier. Motor unit: Garrard SP25. Contemporary styled cabinet in teak/leather cloth finish. Size: 7 × 16 × 14in. Price: £24 (plus £6.34 PT).

#### P100

Lowline cabinet in teak with black inset and transparent plastic cover designed for use with Radon System 500 amplifier. Motor unit: Garrard SP25 Mk II or Garrard SL65B. Lift-off lid. Cartridge: Goldring G800H. Size: (excluding lid) 3 × 14 × 15in. Price: (P100/SP25 Mk II) £28 (plus £7.39 PT); (P100/SL65) £30 (plus £7.92 PT).

#### ■ SANSUI

Vernitron Ltd, Thornhill, Southampton,  
SO9 5QF. Tel: Southampton 44811.

#### SR1050C ★

Complete turntable and pickup arm on plinth with transparent dust cover. Pushbutton controls. Oil-damped arm raising and lowering device. W and F: <0.07%. S/N: better than 40dB. Four-pole motor. 12in aluminium turntable. Statically balanced pickup arm. Speeds: 33 $\frac{1}{3}$  and 45rpm. Price: £80.30 (including PT).

#### SR2050C ★

Complete turntable and pickup arm on plinth with transparent dust cover. Magnetic cartridge.

★ Indicates entry is illustrated

Speeds: 33½ and 45rpm. W and F: <0.07%. 12in aluminium turntable. Belt drive. Four-pole motor. Statically balanced arm. Tracking error 1.5% maximum. Price: £99.78 (including PT).

### ■ SANYO

Sanyo Marubeni (UK) Ltd, Sanyo House, Bushey Mill Lane, Watford, Herts.  
Tel: Watford 25354/6.

#### TP-78 ★

Turntable with PU and arm on base with tinted Perspex cover. 2-speed, 4-pole motor. Wow and flutter less than 0.3%. Static balance arm with counterbalance weight and lateral balance. Cueing system. Magnetic cartridge MG15 5mV. FR 20Hz-20kHz. Tracking 0.2gm. Price: £55.95 (including PT).

### ■ SONAB LTD

136 Mansfield Road, Acton, London, W3.  
Tel: 01-993 0849.

#### 75-S Mk I ★

Transcription turntable unit with pickup arm and cartridge mounted in plinth with transparent plastic dust cover. Speeds: 33½ and 45rpm. Wow: <0.08% (DIN). Flutter: <0.08% (DIN). Rumble: <60dB (weighted). Speed constancy: better than ±1%. Turntable: 12in diameter non-magnetic, 2½lb. Belt drive. Four-pole synchronous motor. Lightweight tubular arm balanced statically and dynamically. Adjustable for stylus pressures 0.5-3.5gm. Fitted with Shure M75MG type II cartridge with spherical diamond stylus. Price: £67.95 (including PT).

### ■ SONY (UK) LTD

Pyrene House, Sunbury Cross, Sunbury-on-Thames, Middlesex.  
Tel: Sunbury 87644/7.

#### TTS-3000 ★

Turntable and motor unit only. Speeds: 33½ and 45rpm. Fine speed control ±5%. W and F <0.05% RMS. Signal/noise ratio over 60dB. Speed constancy: 0.05%. 12in diameter die-cast aluminium turntable. Weight: 3lb 5oz. Belt drive. Servo-controlled DC motor. Illuminated strobe. Built-in spirit level indicator. Price: £81.50 (including PT).

#### ES1800 ★

Turntable and motor unit on plinth. Size: 19¾ × 16¼ × 7½in. Fine speed control. 12in diameter turntable. Speeds: 33½ and 45. Other details similar to TTS-3000. Price: £120 (including PT).

#### PS1500

Turntable and motor unit with pickup arm on plinth with lid. Speeds: continuously variable 15-18rpm and 30-86rpm, with click stops for 16, 33½, 45 and 78rpm. Motor: four-pole con-



Sansui SR 1050



Sansui SR 2050



Sanyo TP78



Sonab 75-S Mk I

stant velocity. W and F: 0.06% (DIN). Rumble: -60dB (DIN). Speed constancy:  $\pm 0.2\%$  for 10% mains voltage change. Offset pickup arm. Tracking error:  $\pm 0.8\%$ . Stylus pressure adjustment: 0.5-5gm. Bias compensation adjustment. Magnetic cartridge fitted (see Pickup Cartridge Section for details). Finish: cabinet in Eurasian teak with satin silver trim. See-through lid. Mains: 200-240V. 50Hz. Size:  $18\frac{3}{4} \times 16\frac{1}{4} \times 7$ in. Price: £68.75 (including PT).

## ■ THORENS

Metrosound (Sales) Co Ltd,  
Cartersfield Road, Waltham Abbey, Essex.  
Tel: Waltham Cross 31933.

### TD150A Mk II

Transcription turntable with integrated pickup arm. Two speeds,  $33\frac{1}{3}$  and 45rpm. New lowering device, controlled from front panel, and anti-skating device, fitted. Patented plug-in shell with adjustable vertical tracking angle. Stylus pressure adjustable  $\frac{1}{2}$ -4gm. Rumble -65dB DIN. Price: £36.50 (plus £9.66 PT).

### TD150AB Mk II ★

Details as for TD150A Mk II, but plinth mounted. Price: £39.50 (plus £10.46 PT).

### TD150 Mk II

Details as for TD150A Mk II but less pickup arm. Price: £28.50 (plus £7.54 PT).

### TD125 ★

Transcription turntable. Three speeds:  $33\frac{1}{3}$ , 45 and  $16\frac{2}{3}$ rpm. With  $\pm 2\%$  electronic speed control. Low speed synchronous motor, belt driven. Motor is transistor governed. Neon-lit strobe. 12in non-ferrous turntable. W and F 0.09%. Plinth and cover available, also mounting frame if cabinet mounted. Price: £62.50 (plus £16.54 PT).

### TD125AB

Details as for TD125 but complete with TP25 pickup arm and plinth. Price: £95 (plus £25.20 PT).

### Teak Plinth

Suitable for TD125 unit. Price: £6 (plus £1.59 PT).

### Perspex cover

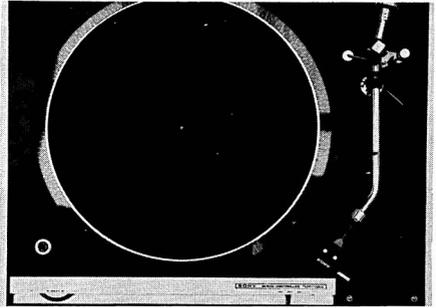
Suitable for TD125 unit. Price: £4.50 (plus £1.19 PT).

## ■ TOSHIBA

Distributors: Hanimex (UK) Ltd,  
Hanimex House, 15-24 Great Dover Street,  
London, SE1. Tel: 01-407 8161.

### SR40

Transcription motor unit in shelf mounting cabinet with pickup. Speeds:  $33\frac{1}{3}$  and 45rpm.



Sony turntable TTS 3000



Sony PS 1800

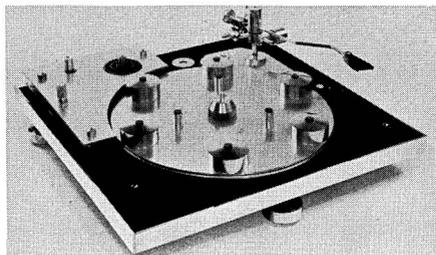


Thorens TD150AB Mk II

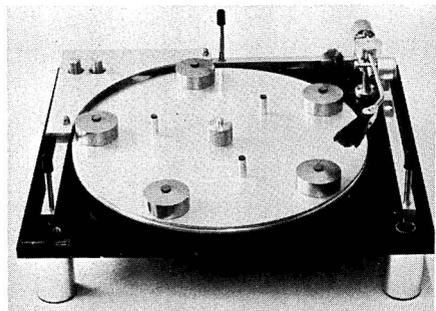


Thorens TD125 and plinth

★ Indicates entry is illustrated



*Transcriptors Reference turntable*



*Transcriptors Saturn*

12in diecast turntable. Belt drive. Rocker switches. Bias compensation. Hydraulically damped lift and lower device. Special Toshiba IC cartridge with FET preamplifier. Whole unit on double-floating suspension. Automatic pickup return and switch-off. Finish: American walnut with clear plastic lid. Size:  $7\frac{3}{4} \times 18\frac{3}{4} \times 15\frac{3}{4}$  in. Price: £87 (including PT).

#### SR50

Transcription motor unit in shelf mounting cabinet with pickup arm and photo-electric cartridge. Speeds:  $33\frac{1}{3}$  and 45rpm. 12in diecast turntable. Belt drive. Brushless servomatic DC motor with electronic control. Fine speed adjustment. Rocker switches. Low-mass resonance-free tubular arm. Bias adjustment. Hydraulic lift. Toshiba Photo-Electronic cartridge with moving mass of only 0.3mg. Built-in preamplifier. Finish: American walnut plinth with hinged clear plastic lid. Size:  $7\frac{1}{2} \times 22\frac{1}{4} \times 15\frac{1}{4}$  in. Price: £175 (including PT).

#### ■ TRANSCRIPTORS LTD

2 Theobald Street, Boreham Wood, Herts.  
Tel: 01-953 0771.

#### Hydraulic reference turntable ★

Self-standing unit, on adjustable acoustic feedback legs, level incorporated. Speeds:  $33\frac{1}{3}$  and

45 only,  $\pm 3\%$  fine speed adjustment by the incorporated hydraulic speed stabiliser. Soft rubber belt, drives 11lb non-ferrous platter via a neon idler stroboscope from a synchronous motor. Strobe geared up 6:1 ratio, resulting in indications more accurate than any measuring instrument. Slipping clutch recoil start motor operated via a vacuum switch. P.T.F.E. main bearing, solid brass gold-plated platter weights. Fabricated Perspex top hinged at rear with swing leg support. Finish Black and Aluminium. All mains voltages and frequencies available. Rumble not measurable. Speed stability 0.005% short term, 0.01% long term. Size:  $17 \times 17 \times 7$  in. Price: (less pickup arm) £63 (plus £15 PT); (with pickup arm) £79.20 (plus £18.90 PT).

#### Saturn turntable ★

Self-standing turntable unit with pickup arm, cover and anti-feedback legs. Speeds:  $33\frac{1}{3}$  and 45rpm. No fine speed adjustment. Wow: better than 0.03%. Flutter: not measurable. Rumble: not measurable. Speed remains constant with variation of mains voltage. 12in diecast aluminium turntable. Weight: 6 $\frac{1}{2}$ lb. Belt drive. Mains: 100-110V or 200-240V 50 or 60Hz. Pickup arm has low-friction stabilised unipivot mounting. Hydraulic lowering. Cueing. Full adjustments. Unit fully suspended. Arm and turntable float free at under 5Hz for acoustic feedback damping. Price: £46.50 (plus £11.10 PT).

#### ■ YAMAHA

Distributor: Jonathan Fallowfield Ltd,  
56-60 St John Street, London, EC1.  
Tel: 01-253 7591.

#### YP70

Two-speed motor unit fitted with arm and cartridge. Mounted on plinth with hinged smoke-tinted cover. Speeds:  $33\frac{1}{3}$  and 45rpm. W and F: 0.08%. Rumble: -46dB (DIN). 12in diecast aluminium turntable. Belt drive. Four-pole motor with three main bearings. Mains: 110-240V AC. Statically balanced tubular pickup arm. Stylus pressure adjustable 0.5gm. Universal plug-in shell. Shell weight: 12gm. Accepts cartridges 5-12gm. Fitted with Yamaha CG5000 magnetic cartridge. Output: 4mV. FR: 10Hz-20kHz. 0.7 thou diamond stylus. Double suspension system to eliminate acoustic feedback, noise from vibration, etc. Size:  $19 \times 16 \times 6$  in. Weight: 20lb. Price: £55.50 (plus £13.23 PT).

# BSR's HT 70 deck: precision for the perfectionist.



The HT 70 is a luxury single player with a fully counterbalanced pickup arm, deep rim 4½ lb die cast turntable, rotating record stub spindle, viscous damped cueing device, slide-in cartridge holder, anti-skate control, and a 4 pole dynamically balanced synchronous motor.

Other high-precision decks in the BSR McDonald range include the MP 60 single player, with many of the HT 70's quality controlled features, and 3 automatics – the 610, 510 and 310. Plus the 210 Micro-minichanger, a total turntable package complete with ceramic stereo cartridge, plinth and smoked styrene cover.

Write now for further information to:  
BSR Limited, McDonald Division, Monarch Works,  
Cradley Heath, Warley, Worcs.  
Tel: Cradley Heath 69272



**BSR** **McDONALD**

It's a sound start.

**Our most expensive bargain.**



It costs far less than other high quality stereo magnetic cartridges that in no way approach its superb performance.

All the other cartridges in our Series 800 stereo magnetic range offer the same value even the G850 which gets the best out of budget Hi-Fi systems.

Seems we have world-beating magnetic bargains here at all levels. Full details on request.

**Goldring  Series 800**

Stereo Magnetic Cartridges

Goldring Manufacturing Company (Great Britain) Ltd, 10 Bayford St, Hackney, London E8 3SE. Tel: 01-985 1152.

# Directory of Radio Tuners

★ Indicates entry is illustrated.

Abbreviations used in this section are given on page 46.

■ **ACOUSTICAL** See Quad.

## ■ **A/R/D**

Audio Research and Development Ltd,  
PO Box 73, Hounslow, Middlesex.  
Tel: 01-570 0471.

### **2000**

Stereo FM/VHF tuner with pushbutton station selector. Designed to operate with A/R/D 2000 amplifier system. Price: (grey case) £56 (plus £11 PT); (teak veneered case) £59 (plus £11.60 PT).

## ■ **ARMSTRONG AUDIO LTD**

Wartlers Road, London, N7. Tel: 01-607 3213.

### **Model 523 ★**

AM/FM tuner. Range: VHF 86-109 MHz, MW 185-590 metres, LW 1000-2000 metres. Variable tuning. FM ratio detector. Meter tuning indicator. Sensitivity: FM 1.5µV for 30dB quieting, AM 5µV for 20dB quieting. Aerial input: 75 ohms coaxial and 300 ohms balanced. Output: 0-1V variable. Stereo multiplex decoder optional (see M8 Decoder below). FM quiet-tuning control. Stereo indicator light. Edge connector for plug-in decoder. Mains: 100-125V and 200-250V AC. Size: 11½in wide, 10½in deep, 4½in high. Price: £43 (plus £10.76 PT).

### **Model 524 ★**

FM tuner. Range: 86-109MHz. Variable tuning. Ratio detector. Meter tuning indicator. Sensitivity: 1.5µV for 30dB quieting. Aerial input: 75 ohms coaxial and 300 ohms balanced. Output: 0-1V variable. Stereo multiplex decoder optional extra (see M8 Decoder below). Quiet-tuning control. Stereo indicator light. Edge connector for plug-in decoder. Mains: 100-125V and 200-250V AC. Size: 11½in wide, 10½in deep, 4½in high. Price: £33.50 (plus £8.38 PT).

### **Model M8**

Plug-in stereo multiplex decoder for 523 and 524 tuners, 525 and 526 tuner/amplifiers. Price: £9.50.

## ■ **BANG & OLUFSEN UK LTD**

Eastbrook Road, Gloucester, GL47DE.  
Tel: Gloucester 21591.

## **Beomaster 5000 ★**

Transistor stereo FM tuner. FM/VHF only. Variable tuning. Ratio detector. Meter tuning indicator. Sensitivity: 0.8µV for 20dB quieting. Aerial input: 75 ohms coaxial and 300 ohms balanced. Output: 55mV-1V adjustable. Stereo multiplex decoder incorporated. AFC. Inter-station muting. Mains supply. Automatic stereo/mono switching. Matches Beolab amplifier. Teak or rosewood finish. Size: 18½ × 4 × 9½in. Price (teak): £107.75 (including PT); (rosewood) £108.75 (including PT).

## ■ **BRYAN AMPLIFIERS LTD**

18 Greenacres Road, Oldham, Lancs.  
Tel: 061-624 4074.

### **FET 1500**

Stereo FM tuner incorporating FET front end. Full details and price not available as this edition went to press.

## ■ **CROWN RADIO CO LTD**

128-129 Shoreditch High Street,  
London, E16JE. Tel: 01-739 2382.

### **FM-500 ★**

Solid state stereo tuner. Range: 87-108MHz, 187-570m. AFC. Output: 0.5V 10K. Stereo indicator glows automatically. Finish: oiled walnut. Dimensions: 4½ × 15½ × 10½in. Weight: 8½lb. Price: £42.45 (plus £10.48 PT).

## ■ **EAGLE INTERNATIONAL**

Heather Park Drive, Wembley, HA1 1SU.  
Tel: 01-903 0144.

### **AFT60 ★**

Transistorised AM/FM stereo tuner. Range: FM 88-108.5MHz, MW 187-500m. Variable tuning. Meter tuning indicator. Stereo beacon. Sensitivity: FM 2µV, AM 500µV. Aerial input: 75 ohms coaxial. Output: 50-200mV variable. Decoder included. Four double-tuned IF stages. Switchable AFC. 13 silicon transistors. Mains: 220/240V AC. Size: 12½ × 4½ × 9½in. Price: £43 (plus £10.94 PT).

### **TST152 ★**

AM/FM stereo tuner matching the Eagle TSA-149 and TSA151 integrated amplifiers. Range: FM 87-109MHz, MW 182-572 metres. Variable tuning. AFC. Inter-station muting. Sensitivity: FM 2µV for 20dB quieting, AM 300µV. Stereo separation: 28dB at 1kHz. Aerial input: 75 ohms coaxial. Output: 0-500mV adjustable. Size: 13 × 3½ × 8½in. Wood shelf-mounting cabinet. Price: £31 (plus £7.60 PT).

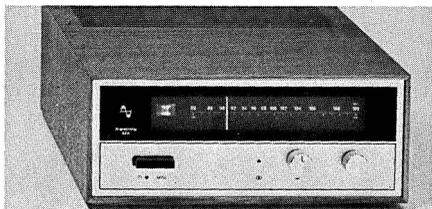
## ■ **GOODMANS LOUDSPEAKERS LTD**

Downley Road, Havant, Hampshire, PO9 2NL.  
Tel: Havant 6344. Telex: 86296.

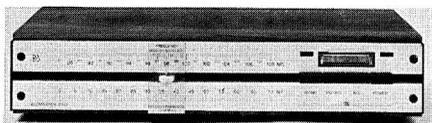
★ Indicates entry is illustrated



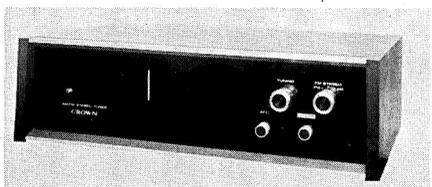
Armstrong Audio 523 AM-FM



Armstrong Audio 524 FM



Bang & Olufsen 500



Crown FM-500



Eagle TST 152



Eagle AM/FM stereo tuner AFT60

### Stereomax ★

All-silicon transistor AM/FM stereo tuner. Ranges: VHF 87.5-108MHz, MW 186-550 metres. Variable tuning with separate dials and drives for AM and FM. Ratio detector on FM. Meter tuning indicator, lamp stereo indicator. Sensitivity:  $2\mu\text{V}$  f or 30dB quieting. Aerial input: FM/VHF 70 ohms coaxial, 300 ohms balanced. Output: 250mV for 30% modulation. Multiplex decoder fitted but version without decoder available. AFC on both wavebands. Controls: AM tuning, FM tuning, wavechange switch including mono/stereo, on/off push-button, AFC, local-distant switch, quiet tuning switch. Mains: 105, 120, 200, 220, 240V AC 40-60Hz. Size:  $5\frac{1}{2}$ in wide,  $10\frac{1}{2}$ in high,  $7\frac{1}{4}$ in deep. Finish: teak or walnut. Price: £65.25 (plus £17.27 PT).

### GRAMPIAN REPRODUCERS LTD

19 Hanworth Trading Estate, Feltham, Middx. Tel: 01-894 9141. Cables: Reamp, Feltham.

#### FM tuner 571

Free-tuned. Range: 85-98MHz. Ratio det. Magic eye ind. Psn 300V at 35/40mA; 6.3V at 2.5 amps. Size:  $10\frac{1}{4} \times 5\frac{1}{2} \times 6\frac{1}{4}$ in. Price: £25.40 (plus £6.28 PT). Power pack £9.95.

### GRUNDIG (Great Britain) LTD

Hi-Fi Division, 15 Orchard Street, London, W1. Tel: 01-935 4898.

#### RT100 ★

AM/FM stereo tuner. Pre-selection of five VHF stations. Range: 87.5-108MHz, MW 185-587m, LW 680-2050m, SW1 34-99m, SW2 13.5-35m. Tuning meter. Stereo indicator beacon. Sensitivity: VHF  $1.5\mu\text{V}$  at 15kHz deviation and 26dB quieting; AM  $5\text{-}12\mu\text{V}$  for 10mV audio. Stereo multiplex decoder fitted. Switched AFC. 45 transistors, 37 diodes. Image rejection: FM 60dB, AM 12-56dB. Distortion factor:  $<0.5\%$  for 40kHz deviation. Output: FM 650mV, AM 800mV. Output impedance: 2K, rec. load  $>22\text{K}$ . Mains: 110, 130, 220, 240 50/60Hz. Finish: oiled teak (matt walnut to special order). Size:  $6 \times 20 \times 12$ in. Price: £182.15.

### HEATHKIT

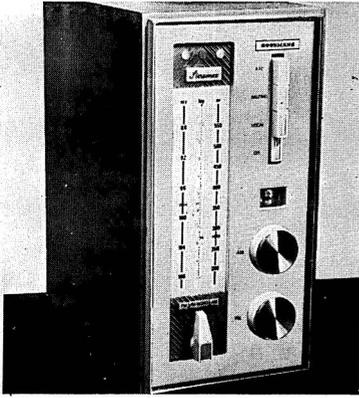
See Constructional Kits Section.

### KLINGER CONTROLS LTD

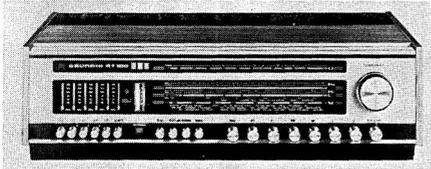
Chalcot Centre, 7 Chalcot Road, London, NW1 8LU. Tel: 01-586 2922/3.

#### KC91 ★

FM/VHF tuner. Bands: 87.5-108MHz. Five preset stations on pushbuttons. Ratio detector. Sensitivity:  $1\mu\text{V}$  for 20dB quieting. Aerial input: 75 ohm coaxial and 300 ohm balanced. Output: variable up to 2V. Stereo decoder fitted. Switch-



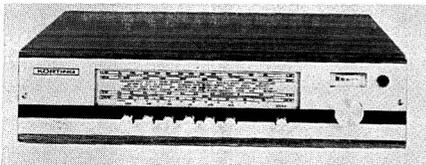
Goodmans Stereomax AM/FM



Grundig RT 100



Klinger KC 91



Korting T500



Leak Stereofetic

able AFC. Mains: 110-130V and 200-250V AC. Circuit includes integrated circuits (IC), ceramic filters and variable capacity diode tuning. Stereo beacon fitted. Size:  $13 \times 4\frac{1}{2} \times 8\frac{1}{2}$  in. Finish: teak veneer. Price: £38.85 (plus £9.15 PT).

■ **KORTING**

Distributors: Europa Electronics Ltd, Howard Place, Shelton, Stoke on Trent, ST14NW. Tel: Stoke on Trent 29316.

**T500, Type 29813 ★**

AM/FM stereo tuner. Range: FM 87.5-104 MHz; SW 40-51 metres, MW 185-587 metres, LW 850-2070 metres. 12 silicon transistors, 11 diodes and one rectifier. Four-stage IF amplifier. Automatic band-width control on AM, dependent on signal strength. Tuning meter. Sensitivity:  $3\mu\text{V}$  for 20dB quieting on FM. Internal ferrite aerial for AM bands. Stereo decoder fitted. Automatic stereo beacon. Finish: satin walnut. Size:  $14 \times 3\frac{1}{2} \times 9$  in. Price: approximately £54 (including PT).

■ **LEAK**

Rank Wharfedale Ltd, Bradford Road, Idle, Bradford, Yorks. Tel: Bradford 612552. Telex: 51407.

**Stereofetic ★**

Transistorised FM stereo tuner. Variable tuning. Range: 87-108MHz. Sensitivity:  $2.5\mu\text{V}$  for 30dB signal to noise. 75 ohms unbalanced aerial input. Output: 0.9V RMS per channel. Distortion:  $<0.5\%$  for full deviation. Tuning meter. Price: chassis model £66.50 (including PT), in wood case £72.50 (including PT).

■ **L & H**

Distributors: Britimpex Ltd, 8-12 Rickett Street, London, SW6. Tel: 01-3850883. Telex: 22758 Brytron, London.

**Signalmaster Mk III 6087 ★**

Self-contained battery-operated FM/VHF tuner. Will also operate from 32V from L & H Audiomaster amplifier. Plug-in V aerial. Socket for 70 ohm external aerial. Push-button on/off and AFC. Illuminated tuning scale. Transistors. Range: 86-104MHz. PP9 or equivalent battery. Consumption 9mA. Teak case. Size:  $11\frac{1}{4} \times 3\frac{1}{2} \times 7\frac{1}{8}$  in. Price: £25.90 (plus £5.55 PT).

**Stereo decoder module**

Plug-in type suitable for Signalmaster Mk III. Fits inside case. Channel separation better than 32dB at 1kHz. Consumption 3mA. Automatic stereo beacon. Price: £7.87. Connecting lead with 5-pin plug. Price: 75p.

■ **LOWTHER MANUFACTURING CO**

Lowther House, St Mark's Road, Bromley, Kent, BR29HQ. Tel: 01-460 5225. Cables: Lowther, Bromley.

★ Indicates entry is illustrated

### FM Tuner Mk VII ★

Self-powered transistorised VHF/FM tuner. Range: 87.5-108MHz. Variable tuning with switchable AFC. Stereo decoder fitted. Aerial input: 72 ohms coaxial. Output: 0.75V RMS. Stereo beacon. Tuning meter. Finish: teak or walnut with satin chrome panel. Size:  $10\frac{3}{8} \times 5\frac{1}{2} \times 5\frac{1}{2}$ in. 200-240V 50Hz. Price: £40 (plus £10.45 PT).

### TV Sound Tuner

Self-powered TV tuner. Range: UHF bands IV and V. Push-button tuning, adjustable to all channels. Output: preset gain control 0-500mV RMS. Output socket for tape recorder. Aerial input: 72 ohms coaxial. Size:  $10\frac{3}{8} \times 5\frac{1}{2} \times 5\frac{1}{2}$ in. Finish: teak or walnut with satin chrome panel. 200-240V 50Hz. Price: £38 (plus £9.93 PT).

### ■ LUX

Howland-West Ltd,  
2 Park End, South Hill Park, London, NW3.  
Tel: 01-794 6666/6033.

### WL717 ★

AM/FM stereo tuner. Range: 88-108MHz, 187-572 metres. Variable tuning. Meter tuning indicator. Sensitivity:  $3\mu\text{V}$  for 20dB quieting. Output: 700mV. Stereo decoder fitted. FET cascode amplifier in front end. Mains: 240V AC. Size:  $15\frac{3}{8} \times 5\frac{1}{2} \times 9\frac{1}{8}$ in. Price: £60 (plus £14.63 PT).

### WL515 ★

AM/FM stereo tuner. Range: 88-108MHz, 187-572 metres. Variable tuning. Meter tuning indicator. Sensitivity:  $2.5\mu\text{V}$  for 20dB quieting. Aerial input: 75 ohms coaxial or 300 ohms balanced. Output: 1V. Stereo decoder fitted. FET cascode front end. Five IF amplifier stages. Mains: 100, 117, 220, 240V AC. Size:  $17\frac{3}{8} \times 5\frac{7}{8} \times 10\frac{1}{8}$ in. Price: £88 (plus £21.46 PT).

### WL212

AM/FM stereo tuner. Range: 88-108MHz, 187-572 metres. Variable and preset tuning. Meter tuning indicator. Sensitivity:  $1.7\mu\text{V}$  for 20dB quieting. Aerial input: 75 ohm coaxial or 300 ohm balanced. Output: 1V. Stereo decoder fitted. Five preset station stations on FM. Mains: 100, 117, 220, 240V AC. Size:  $18\frac{3}{8} \times 6\frac{1}{2} \times 11$ in. Price: £200 (plus £48.75 PT).

### ■ MOTION ELECTRONICS

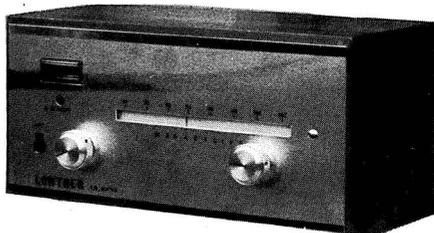
Addlestone Farm, Tonbridge Road,  
East Peckham, Kent. Tel: East Peckham 354.

### Television Sound Monitor ★

Tuner unit designed to receive VHF and UHF television sound broadcasts. Varicap tuning with six preset pushbuttons, all manually adjustable. Ratio detector for FM, diode detector for AM. Centre-zero tuning meter. Sensitivity: 10 microvolts. Aerial input: 75 ohm coaxial or 300 ohm balanced. Output adjustable up to 0.5V.



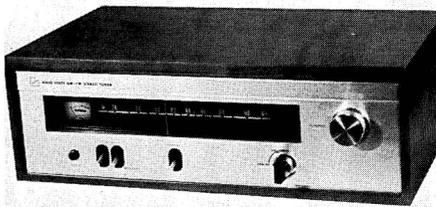
L & H Signalmaster 6087



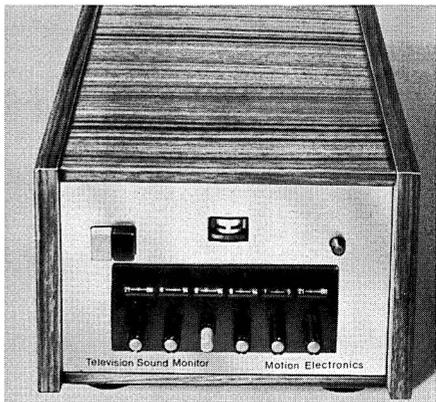
Lowther Stereo tuner Mk VII



Lux WL717



Lux WL515



Motion Electronics TV Tuner

Mains: 110/240V AC. Consumption: 5W. Available in cabinet or chassis form for building-in. Cabinet teak veneered with finely grained silver finished front panel. Suitable for vertical or horizontal mounting. VHF coverage: 41-66.75MHz and 176-215MHz. UHF coverage: 470-846 MHz. Prices: (VHF-only chassis) £36.10 (plus £9.26 PT); (VHF-only in cabinet) £39.56 (plus £10.15 PT); (UHF-only chassis) £35.65 (plus £9.15 PT); (UHF-only in cabinet) £39.15 (plus £10.15 PT); (VHF and UHF chassis) £40 (plus £10.26 PT); (VHF and UHF in cabinet) £43.50 (plus £11.15 PT).

■ NATIONAL PANASONIC

UK distributors: Unamec Ltd, PO Box 1, United Africa House, Blackfriars Road, London, SE1. Tel: 01-928 2070.

**Panasonic SA-54**

Solid state stereo FM. Range: 88-108MHz. Variable tuning with Luminaband indicator. FM detector: Foster-Seeley. Sensitivity: 1.8µV. Aerial: 300 ohms balanced. Output: 32W per channel. Multiplex decoder. AFC. Psn mains. Dimensions: 5½ × 19¾ × 14in. FETs. Full-range controls: high/low filter, muting, loudness, ceramic filter, three switched aux, power sockets, ceramic-magnetic input. Price: £123.52 (plus £30.52 PT).

■ NIKKO ELECTRIC MFG CO LTD

Distributors: Howland-West Ltd, 2 Park End, South Hill Park, London, NW3. Tel: 01-794 6666 and 6033.

**Nikko FAM-12F ★**

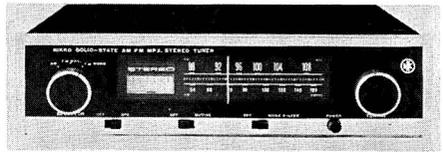
AM/FM transistorised tuner. Range: VHF 88-108MHz, MW 182-566 metres. Variable tuning. Meter indicator. Sensitivity: 2µV for 20dB quieting. Output: 0.5V. Stereo multiplex decoder fitted. Switchable AFC. Mains: 200-240V 50/60Hz. Local-distance control. Noise filter. Stereo indicator. 17 transistors, 16 diodes. Size: 12 × 10 × 3½in. Weight: 7¼lb. Price: £55 (plus £13.41 PT).

**Nikko FAM-14**

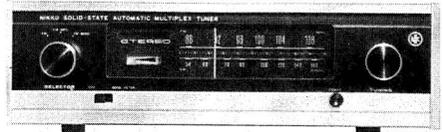
AM/FM tuner. Range: 88-108MHz, 187-567m. Variable tuning with meter indicator. Sensitivity: 1.8µV. Output: FM 1.2V; AM 0.5V. Multiplex decoder fitted. AFC. Mains powered. Dimensions: 13 × 9½ × 3¾in. Panel dimmer control. Stereo output 10mV. Price: £75 (plus £18.29 PT).

**Nikko FAM-10 ★**

AM/FM tuner. Range: VHF 88-108MHz, MW 187-561 metres. Variable tuning. Meter tuning indicator. Sensitivity: 1.8µV (IHF 2.5µV). Aerial impedance 300 ohms balanced. Output: 1V. Stereo decoder fitted. Mains powered. Size: 12 × 10 × 3½in. Price: £39 (plus £9.51 PT).



Nikko FAM-12F



Nikko FAM10



Nivico MCT-V7E

■ NIVICO

Denham & Morley Ltd, Denmore House, 453 Caledonian Road, London, N7. Tel: 01-607 6568. Telex: 24562.

**MCT-V7E ★**

AM/FM stereo tuner. Range: FM 88-108MHz, MW 187-567 metres. Variable tuning. Two tuning meters. Aerial input: 300 ohms balanced and 75 ohms coaxial. Sensitivity: 1.71µV for 20dB quieting. Capture ratio: 0.8dB. HD: (mono) <0.4%, (stereo) <0.6%. S/N: better than 65dB. Separation: better than 35dB at 1kHz, better than 22dB at 10kHz. FET front end. Four-gang tuning. Two ICs and four filters in IF amplifier stage. Inter-station muting. Stereo beacon. Centre-zero meter for FM tuning. Price: £125.95 (inc. PT).

■ PEAK SOUND

Peak Sound (Harrow) Ltd, 32 St Judes Road, Englefield Green, Egham, Surrey. Tel: Egham 5316.

**840T**

Stereo FM tuner. Range: 88-108MHz. Four tunable push-button station selectors. Switchable AFC. Sensitivity: 1µV for 30dB quieting. Stereo sub-carrier rejection: 48dB at 19kHz. S/N: 60dB. FR: 10Hz-15kHz — 3dB. Separation: better than 22dB at 10kHz.

★ Indicates entry is illustrated

tion: -35dB (100Hz-10kHz). Aerial input: 75 ohms coaxial and 300 ohms balanced. Tuning meter. Automatic stereo beacon. Designed for use with the Peak Sound Englefield stereo amplifier 840A, but suitable for use with other amplifiers. Incorporates dual gate FET and IC circuitry, back-to-back variable capacity diodes and ceramic filters. Guaranteed for five years. Price: £45 (inc. PT).

## ■ PHILIPS

Philips Electrical Ltd, Century House,  
Shaftesbury Avenue, London, WC2.

Tel: 01-437 7777.

### RH690 ★

Three waveband stereo tuner. 87.5-108MHz, 187-577m and 1,154-2,000m with variable tuning and ratio FM det. Sensitivity:  $7\mu\text{V}$  (VHF) for 26dB quieting;  $500\mu\text{V}$  (AM). Aerial 300 ohm balanced and ferrite rod. Switchable decoder with indicator lamp. AFC. Output: 250 mV, 10K. Psn: 110, 127, 220, 240V AC. Dimensions:  $13\frac{1}{2} \times 2\frac{7}{8} \times 8\frac{1}{2}$  in. Price: £47.50 (inc. PT).

### RH691 ★

Four waveband stereo tuner: 87.5-108MHz, 187-571m, 750-2,000m, 16.2-50.8m. Variable tuner with duplex flywheel control and tuning indicator meter. Ratio FM det. Sensitivity:  $7\mu\text{V}$  (VHF) for 26dB quieting;  $90\mu\text{V}$  (AM). Aerial 300 ohm balanced and switchable ferrite rod. Decoder with indicator lamp. Switchable AFC. Outputs: 1.4V (FM), 600mV (AM), 10K. Psn: 110, 127, 220, 240V AC. Dimensions:  $14\frac{1}{8} \times 3\frac{7}{8} \times 10\frac{3}{8}$  in. Price: £89 (inc. PT).

## ■ PIONEER

Distributors: Shriro (UK) Ltd,  
42 Russell Square, London, WC1B 5DF.

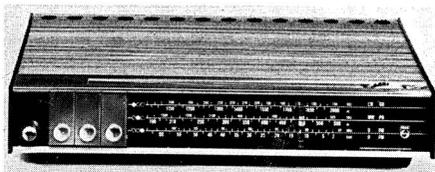
Tel: 01-580 6996.

### TX500

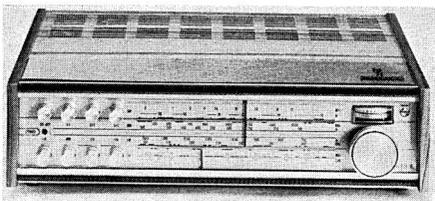
AM/FM stereo tuner. Range: FM 87-108MHz, MW 187-562 metres. Variable tuning. Meter indicator. Sensitivity:  $2.5\mu\text{V}$  for 20dB quieting. Aerial input: 300 ohms balanced. Output: 1V. Stereo decoder fitted. AFC. FET input with three-gang tuning. Multiplex noise filter. Outlet for tape recorder. Mains: 110, 117, 220 and 240V AC. Size:  $13 \times 5 \times 13$  in. Price: £65.83 (plus £13.44 PT).

### TX700

FM stereo tuner. Range: FM 87.5-108MHz. Variable and preset tuning. Meter tuning indicator. Sensitivity:  $2.2\mu\text{V}$  for 20dB quieting. Aerial input: 300 ohms balanced. Output: 1V. Stereo decoder fitted. FET front end. Variable capacity diode tuning. Up to five preset stations. Mains: 110, 120, 130, 220, 240V AC. Size:  $10\frac{3}{8} \times 4\frac{1}{8} \times 13\frac{1}{4}$  in. Price: £94.40 (plus £19.99 PT).



Philips RH690



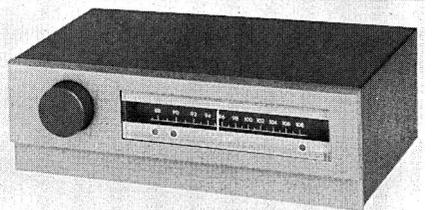
Philips RH691



Pioneer TX900



Quad AM3



Quad FM3

**TX900 ★**

AM/FM stereo tuner. Range: FM 87.5-108 MHz, MW 187-562 metres. Variable tuning. Two tuning meters. Sensitivity:  $1.7\mu\text{V}$  for 20dB quieting. Aerial input: 300 ohms balanced. Output: 1V. Stereo decoder fitted. AFC. Three FETs. Two crystal filters. Four ICs. Muting control. Gain controls for AM and FM outputs. Mains: 110, 117, 130, 220, 240V AC. Size:  $16 \times 5\frac{1}{2} \times 14\text{in}$ . Price: £125.42 (plus £26.56 PT).

**■ QUAD**

Acoustical Manufacturing Co Ltd, St Peter's Road, Huntingdon, Hunts. Tel: Huntingdon 2561/2. Cables: Acoustical.

**Quad AM3/European ★**

Variable tuning. Range: LW 800-2070m, MW 185-588m, SW 16.2-52m. Tuning indicator. Aerial/earth sockets. Output: 100mV nominal for 30% modulation. Output impedance: 15K. Switched variable selectivity. 9kHz filter for adjacent channel heterodyne. IF: 470. kHz. Mains: 100-130V or 200-250V 50-60Hz. Consumption: 25W. Three valves plus magic eye. Removable metal cover permits mounting through cabinet cut-out. Size: (free standing)  $3\frac{5}{8}\text{in}$  high,  $10\frac{1}{4}\text{in}$  wide, 8in deep; (panel mounting)  $3\frac{1}{2}\text{in}$  high,  $10\frac{1}{4}\text{in}$  wide,  $7\frac{1}{8}\text{in}$  deep. Weight: 8lb. Price: £38 (plus £10.45 PT).

**Quad AM3/Overseas ★**

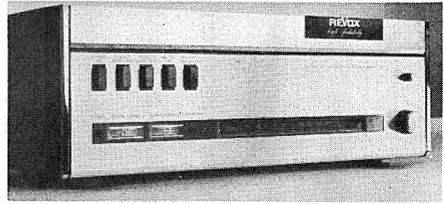
Range: MW 185-588m, SW1 45-136m (2.2-6.6 MHz), SW2 16.2-52m (5.8-18.5MHz). 10kHz filter for adjacent channel heterodyne. All other details as for AM3/European. Price: £38 (plus £10.45 PT).

**Quad FM3 ★**

Stereo FM tuner. Range: 88-108MHz. Variable tuning. High stability tuned stages maintain accuracy without AFC. Twin neon tuning indicator. Sensitivity:  $2\mu\text{V}$  for full limiting. Aerial input: 75 ohm coaxial and 300 ohm balanced. Output: 100mV per channel for 30% modulation. Stereo decoder fitted. Image rejection: 56dB. IF rejection: 80dB. Capture ratio: 3dB. FR: 20Hz-15kHz  $\pm 1\text{dB}$ . Separation: 40dB at 1kHz. Distortion: 1kHz at 40kHz deviation, 0.2%. Recommended load: greater than 50K. De-emphasis: 50 $\mu\text{Sec}$  or 75 $\mu\text{Sec}$  as required. Mains: 100-125V, 200-250V 50-60Hz. Dual gate MOS FET input stage. Integrated circuits (ICs) in IF and decoder. Ceramic filters in IF chain. Output via 5 pin DIN connector. Size:  $10\frac{1}{4} \times 3\frac{1}{4} \times 5\frac{1}{2}\text{in}$ . Price: £58 (plus £15.95 PT).

**■ RADFORD**

Radford Audio Ltd, Ashton Vale Road, Bristol BS32HZ. Tel: Bristol 662301.



Revox A76

**FMT-3**

Stereo FM tuner. Range: 88-108MHz. Variable tuning. Ratio detector. Meter tuning indicator. Sensitivity:  $2\mu\text{V}$  for 20dB quieting. Aerial input: 75 ohms coaxial, 300 ohms balanced twin. Output: 1V. Stereo decoder fitted. AFC. Mains: 110, 125, 140, 235, 250. Size:  $6\frac{1}{4} \times 15 \times 14\frac{1}{2}\text{in}$ . Price: £60 (plus £15.68 PT).

**■ RADON**

Radon Industrial Electronics Co Ltd, Brooklands Trading Estate, Orme Road, Worthing, Sussex. Tel: Worthing 34904/5/6.

**Series 404 Mk II**

Solid state FM tuner. Range: 87-106MHz. Sensitivity:  $15\mu\text{V}$  for limiting. AFC. Aerial: 75 ohms coaxial. AGC: 6dBf or 60dB input change. Fuse protected power pack. Modular construction. Controls: tuning, on-off, AFC. Cabinet finish: blond oak or teak with satin lacquer. Stereo decoder fitted. AFC. Price: £22 (plus £5.50 PT).

**■ REVOX**

Distributors: C. E. Hammond & Co Ltd, Lamb House, Church Street, London, W4. Tel: 01-995 4551. Telex: 934047.

**Revox A76 ★**

Stereo FM tuner. Range: 87.5-108MHz. Sensitivity:  $1\mu\text{V}$  for 30dB S/N. Distortion: 0.2% for 40kHz deviation at 1kHz. S/N (unweighted) 70dB. Stereo separation 40dB. Output: 0-1V for 75kHz deviation (adjustable). FR: 30Hz-15kHz  $\pm 1\text{dB}$ . De-emphasis: 50 $\mu\text{Sec}$ . 41 silicon transistors, 27 diodes, 6 integrated circuits, 2 dual insulated-gate FET, 2 rectifiers. Mains: 110, 130, 150, 220, 240, 250V 50/60 Hz. Consumption: 20W. Size:  $6\frac{1}{8} \times 16\frac{3}{8} \times 9\frac{5}{8}\text{in}$ . Weight: 17 $\frac{1}{2}\text{lb}$ . Price: £162.75 (including PT).

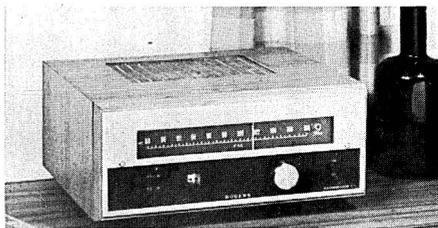
**■ ROGERS DEVELOPMENTS (Electronics) LTD**

4-14 Barmeston Road, Catford, London, SE6. Tel: 01-698 7424/4340. Cables: Rodevco, London, SE6.

★ Indicates entry is illustrated

### Ravensbrook FET FM tuner

Range: 88-108MHz. Variable tuning. Ratio detector. Centre-zero meter. Sensitivity: better than  $5\mu\text{V}$  (IHFM). Aerial impedance: 75 ohms coaxial and 300 ohms balanced. Output: 200 mV for 30% modulation. Stereo decoder fitted. Switchable AFC. Three-gang FET front-end. Integrated circuit IF strip. Switchable inter-station noise suppression. Mains: 105/125V, 200/250V, 50-60Hz. Consumption: 7.5W. Size: (chassis)  $3\frac{3}{4} \times 10\frac{3}{4} \times 10$ in; (cabinet)  $5 \times 11\frac{1}{2} \times 10$  in. Prices: (chassis) £45.01; (in cabinet) £51.26. Both prices include PT.



Rogers Ravensbourne 2FET

### Rogersbourne 2 FET tuner, Series II ★

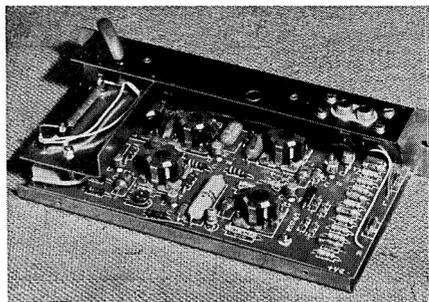
Range: 88-108MHz. Variable tuning. Wide-band ratio detector. Centre-zero tuning meter. Sensitivity:  $2.7\mu\text{V}$  for 30dB quieting. Aerial impedance: 75 ohms coaxial and 300 ohms balanced. Output: 200mV average for 30% modulation. Integrated circuits in IF strip. Multiplex decoder. Switched AFC. FET front end. Inter-station noise suppression. Mains: 200-250V AC. Consumption: 8W. Size: (chassis)  $11\frac{1}{2} \times 11 \times 4$ in; (case)  $12\frac{1}{2} \times 11\frac{1}{2} \times 5\frac{1}{4}$ in. Prices: (chassis with decoder) £61.89; (in cabinet with decoder) £66.89. Both prices including PT.



Rogers stereo decoder

### Multiplex stereo decoder Mk II ★

Designed for use with Rogers FM tuners but also suitable for operation with other makes of tuner. Unpowered and self-powered versions. Automatic electronicswitching for stereo broadcasts. Mullard Vinkor tuned circuits. Seven silicon planar transistors. Selective anti-noise filter. High degree of filtering permits tuner to be connected to tape recorder without interference (input impedance to recorder must be over 100K). Stabilised 12V supply. Input signal level: 0.5-1V. Input imp 30K approx. Output: 700mV RMS for input of 350mV RMS per channel. Separation: better than 30dB at 1kHz. Total spurious output (including 19/38kHz): better than -50dB. Mains: 105-125V, 200-250V AC. Price: £14.50.



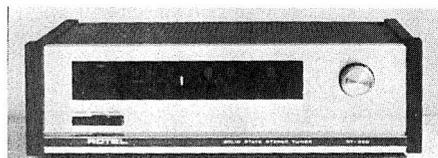
Rogers stereo decoder

### ROTEL

Rank Audio Products,  
PO Box 70, Great West Road,  
Brentford, Middlesex.  
Tel: 01-568 9222. Telex: 24408.

### RT620

AM/FM stereo tuner. Range: FM 88-108MHz, MW 187-562 metres. Variable tuning. Meter indicator. Sensitivity:  $1.7\mu\text{V}$  for 20dB quieting. Aerial input: 300 ohms balanced (can be changed to 75 ohms coaxial). Stereo decoder fitted. FET input. Integrated circuits. Four-gang variable capacitor tuning. Two-stage RF amplifier. Ceramic filters. Variable muting. Adjustable output voltages for AM and FM. Mains: 100-



Rotel RT320



Sansui TU555

240V AC. Size:  $16\frac{1}{2} \times 8\frac{3}{4} \times 4\frac{7}{8}$ in. Price: to be announced.

**RT320 ★**

AM/FM stereo tuner. Range: FM 88-108MHz, MW 187-562 metres. Variable tuning. Meter indicator. Sensitivity:  $8\mu\text{V}$  for 20dB quieting. Aerial impedance: 300 ohms balanced (can be changed to 75 ohms coaxial). Stereo decoder fitted. FET front end. Integrated circuits. FM stereo/mono switching. Illuminated dial pointer. Mains: 117, 240V AC. Size:  $13\frac{3}{8} \times 4\frac{3}{8} \times 9\frac{1}{8}$ in. Price: to be announced.

■ **SANSUI**

Vernitron Ltd, Thornhill, Southampton, SO9SQF. Tel: Southampton 44811.

**Sansui TU555 ★**

Stereo AM/FM tuner. Range: 88-108MHz. 187-560m. Variable tuning with indicator meter. FM detector: ratio. Sensitivity: FM  $2.0\mu\text{V} \pm 3$  dB (20dB quieting). Aerial: coaxial and balanced. Output voltage: greater than 1.5V. Multiplex decoder fitted. Psn: 100-240V AC, 10W. Dimensions:  $4\frac{3}{8} \times 11\frac{1}{2} \times 11\frac{1}{2}$ in. FET front end. Noise muting circuit. Price: £67.76 (plus £18.73 PT).

**Sansui TU666**

Stereo AM/FM tuner. Range: FM 88-108MHz, MW 187-572 metres. Stereo decoder fitted. Variable tuning. Ratio detector. Tuning meter. Sensitivity:  $2\mu\text{V}$  for 20dB quieting. Aerial input: 300 ohms balanced. Output: 0.7V. Mains: 100-240V AC. Size:  $13 \times 5 \times 10$ in. Price: £74.62 (plus £18.73 PT).

**Sansui TU777 ★**

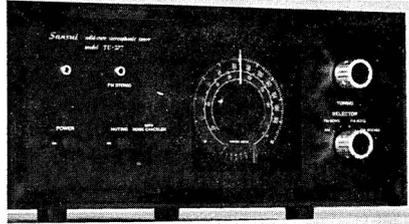
Stereo AM/FM tuner. Range: 88-108MHz, 187-560m. Variable tuning with indicator meter. FM detector: ratio. Sensitivity:  $1.4\mu\text{V} \pm 3$  dB (20dB quieting). Aerial: coaxial and balanced. Output voltage: 0.2V variable. Multiplex decoder fitted. Psn: 100-240V AC, 10W. Dimensions:  $6\frac{1}{2} \times 13\frac{7}{8} \times 13\frac{1}{8}$ in. Circular tuning dial. FET front end. FM local/distant switch. Stereo noise canceller. Price: £18.35 (plus £20.13 PT).

■ **SINCLAIR RADIONICS LTD**

London Road, St Ives, Huntingdonshire, PE174HJ. Tel: St Ives (Hunts) 4311.

**Project 60**

Stereo FM tuner employing phase lock loop principle of detection. Range: 87.5-108MHz. Capture ratio: 1.5dB. Sensitivity:  $2\mu\text{V}$  for 30dB quieting,  $7\mu\text{V}$  for full limiting. AFC fitted (range  $\pm 200\text{kHz}$ ). S/N:  $> 65\text{dB}$ . FR: 10Hz-15kHz  $\pm 1\text{dB}$ . HD: 0-15% for 30% modulation. Stereo decoder fitted (operating level  $2\mu\text{V}$ ). Pilot tone suppression: 30dB. Crosstalk: 40dB. Output: 150mV per channel RMS. Aerial input impe-



Sansui TU777



Sony ST-80F

dance: 75 ohms. Tuning indicator. Stereo beacon. Mains-on pilot light. Power supply required: 25-30V DC. Size:  $8\frac{1}{2} \times 1\frac{1}{2} \times 3\frac{3}{8}$ in. Vari-cap diode tuning. Printed circuit coils. IC decoder. 16 discrete transistors. Inter-station muting. Price: £25 (including PT).

■ **SONY (UK) LTD**

Pyrene House, Sunbury Cross, Sunbury-on-Thames, Middlesex. Tel: Sunbury 87644/7.

**ST-5100**

Stereo transistorised AM/FM tuner. Range: FM 87-108MHz, 187-560m. Variable tuning. AFC. Twin tuning meters. FET front end. Six solid state filters in IF section. AM ferrite rod aerial. Quiet tuning. Flywheel tuning control. Sensitivity: FM  $1.8\mu\text{V}$  for 20dB quieting, AM  $20\mu\text{V}$  on external aerial. FR: (FM) 20Hz-15 kHz  $\pm 1\text{dB}$ . Mains: 100, 117, 220, 240V 50/60 Hz. Size:  $5\frac{1}{2} \times 16\frac{5}{8} \times 13\frac{3}{8}$ in. Price: £99.75 (including PT).

**ST-80F ★**

AM/FM stereo tuner. Range: FM 87-108MHz, MW 187-560 metres. Variable tuning. Meter tuning indicator. Sensitivity: (FM)  $2.4\mu\text{V}$  for 30dB S/N, AM  $10\mu\text{V}$  (external aerial). Aerial

★ Indicates entry is illustrated

input: (FM) 300 ohms balanced. Output: (high level) 2V at 10K, (low level) 700mV at 10K. Stereo decoder fitted. Two FETs, 18 transistors, 16 diodes. FM image rejection: 50dB. FM FR: 30Hz-15kHz +0dB -2dB. Stereo separation: better than 36dB at 1kHz. FM HD: (stereo) 0.8%, (mono) 0.5%. Mains: 100, 117, 220, 240V 50/60Hz. Consumption: 13W. Size: 5in wide, 9½in high, 7½in deep. Finish: walnut with black and satin silver front panel. Price: £49.50.

#### ST-5600 ★

AM/FM stereo tuner. Range: FM 87-108MHz, MW 187-560 metres. Variable tuning. Meter tuning indicator. Sensitivity: 1.4µV for 20dB S/N. Aerial input: (FM) 300 ohms balanced. Output: (fixed) 750mV 5K, (variable) 0.1-5V 2.5K. S/N: (FM) 65dB. Capture ratio: 1.6dB. FM FR: 30Hz-15kHz ±1dB. HD: (FM) mono 0.3%, stereo 0.7%. Separation: better than 38dB at 400Hz. 20 transistors, 18 diodes. Mains: 100, 117, 220, 240V 50/60Hz. Consumption: 13W. Size: 16⅝ × 4⅝ × 10½in. Weight: 9lb. Price: £63.75.

#### ■ STANDARD

Telerenters (London & Provincial) Ltd,  
Standard House, 1-2 Church Way, Edgware,  
Middlesex. Tel: 01-952 7488. Telex: 24792.

#### TU-108WEE

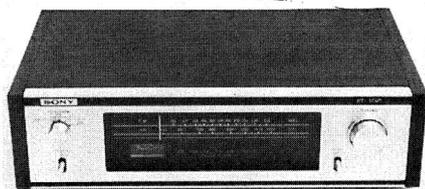
Stereo four-band tuner. Range: FM 88-108 MHz, MW 187-560 metres, LW 810-2000 metres, SW 49-metre band. Variable tuning. Ratio detector for FM. Tuning indicator. Stereo beacon. AFC. Sensitivity: (FM) 5µV, (AM) 20µV. Aerial input: (FM) 300 ohms balanced, (AM) internal ferrite rod. Output: 120mV at 10K. Stereo decoder fitted. Size: 13½ × 3¼ × 7½in. Mains: 230V 50/60Hz. Price: £36.53 (plus £8.08 PT).

#### ■ J. E. SUGDEN & CO LTD

Bradford Road, Cleckheaton, Yorks.  
Tel: Cleckheaton 2501.

#### R21 and R51 ★

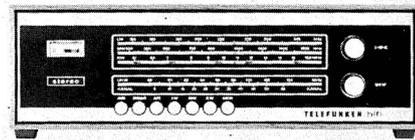
FM stereo tuner. Range: 88-104MHz. Variable and preset tuning. Ratio detector. Centre-zero tuning indicator. Sensitivity: 2µV for 20dB quieting. Aerial input: 75 ohms coaxial and 300 ohms balanced. Output: 0.5V. Stereo decoder fitted. AFC. Mains: 110, 120, 220, 230 and 240V AC. Thermometer type tuning dial. Special decoder filter to prevent spurious oscillations. Switchable decoder filter for low-level transmissions. R21 designed to match J. E. Sugden A21 amplifier. R51 designed to match J. E. Sugden C51 amplifier. Size: (R21) 12 × 9 × 5in; (R51) 11 × 4 × 7in. Price: (both models) £60 (plus £15.02 PT).



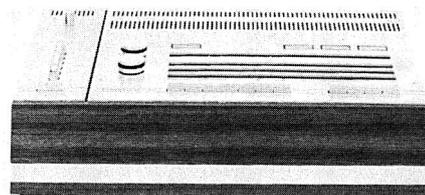
Sony ST-5600



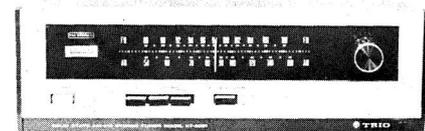
J. E. Sugden R21



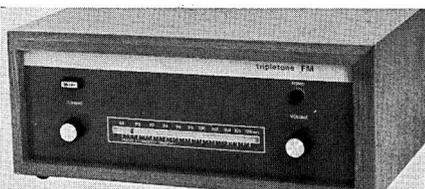
Telefunken T201



Telefunken T250



Trio KT2001



Tripletone FET FM tuner Mk II

■ **TELEFUNKEN**

Distributor: A.E.G. (Great Britain) Ltd, AEG House, Chichester Rents, Chancery Lane, London, WC2. Tel: 01-242 9944. Cables: Allgem, London.

**T201 ★**

Stereo transistorised tuner to DIN 45.500 standards. Ranges: 87.5-104MHz, 5.9-16MHz, 186-584m and 860-2000m. Separate flywheel tuning for FM and AM. AM/FM tuning indicator. Sensitivity: FM 1.2µV for 26dB signal/noise ratio at 40kHz deviation, AM 6µV for 10dB signal/noise. Automatic stereo indicator. AFC. FR: (-1dB) 30Hz-12.5kHz. Output: 900mV 220K. Sockets for 240 ohm FM dipole, local FM dipole (attenuator fitted), AM aerial, amplifier (22K). Features excellent cross-modulation characteristics. Mains operated. Price: £65.19 (plus £15.14 PT).

**T250 ★**

Stereo transistorised tuner to DIN 45.500 standards. Ranges: 87.5-104MHz, SW 5.9-18MHz, MW 185-577m, 860-2000m. Sensitivity: FM 0.8µV for 26dB signal/noise ratio at 25kHz deviation, AM approx 5µV for 10dB signal/noise. Separate AM and FM tuning and tuning indicators. Audio response: (-1dB) 30Hz-14 kHz, less than 0.5% distortion. Sockets for FM and AM aerials, amplifier and tape recorder. Features include five buttons for electronic pre-selection of FM stations, AM bandwidth switching and excellent cross-modulation characteristics. Mains: 110/125, 220/240V 50/60Hz. Price: £157.64 (plus £36.61 PT).

■ **TELETON**

Teleton Electro (Distributors) Co Ltd, Teleton House, Robjohns Road, Widford, Chelmsford, Essex. Tel: Chelmsford 62442. Telex: 99338.

**GT.101**

Solid-state FM/AM stereo tuner matching GA.101 amplifier. Ranges: 88-108MHz, 187-570m. Sensitivity: better than 7µV (FM), 150 µV/m (AM). Multiplex separation: more than 25dB, signal/noise more than 50dB. Aerial: built-in plus extension, 300 ohms balanced. Output: 1V 100% modulated. Mains: 110-117, 220-240V 50-60Hz. Dimensions: 12 × 9½ × 4in. Price: £45.50.

■ **TRIO**

Distributors: B. H. Morris & Co (Radio) Ltd, 84-88 Nelson Street, London, E12DY. Tel: 01-790 4824.

**KT1000A**

AM/FM stereo tuner. Range: FM 88-108MHz, MW 187-556 metres. Variable tuning. Meter tuning indicator. Sensitivity: 3µV (IHFM stan-

ard). Aerial input: 75 ohms coaxial and 300 ohms balanced. Output: 1V FM, 0.4V AM. Stereo decoder fitted. Multiplex noise filter fitted (switchable). Mains: 100-120V and 220-240V 50-60Hz. Price: to be announced.

**KT2001 ★**

AM/FM stereo tuner. Range: FM 88-108MHz, MW 187-556 metres. Variable tuning. Meter tuning indicator. Sensitivity: 2µV (IHFM standard). Aerial input: 75 ohms coaxial and 300 ohms balanced. Output: 1V FM, 0.4V AM. Stereo decoder fitted. Circuit incorporates ICs. Multiplex noise filter fitted (switchable). Mains: 110-120V and 220-240V AC 50/60Hz. Size: 13 × 4⅝ × 9½in. Price: £53.85 (plus £10.15 PT).

**KT5000**

FM stereo tuner. Range: FM 88-108MHz. Variable tuning. Two tuning meters. Sensitivity: 1.7µV (IHFM standard). Aerial input: 75 ohms coaxial and 300 ohms balanced. Output: 1V ±1dB. Stereo decoder fitted. Circuit incorporates FET input and ICs. Output level control. Mains: 110-120V and 220-240V 50/60Hz. Size: 16¼ × 5¼ × 11in. Price: £79.84 (plus £15.16 PT).

**KT7001**

AM/FM stereo tuner. Range: FM 88-108MHz, MW 187-556 metres. Variable tuning. One signal strength meter, one centre-zero tuning meter. Sensitivity: 1.5µV (IHFM standard). Aerial input: 75 ohms coaxial and 300 ohms balanced. Output: 1.5V AM and FM. Stereo decoder fitted. AFC. Circuit incorporates FETs, ICs and crystal filters. Mains: 110-120V and 220-240V 50/60Hz. Size: 16¼ × 5⅝ × 11¼in. Price: to be announced.

■ **TRIPLETONE MANUFACTURING CO LTD**

Factory No. 1, 138 Kingston Road, Wimbledon, London, SW19. Tel: 01-542 1189.

**FM tuner Mk II ★**

Transistorised stereo tuner. Range: 88-108 MHz. Variable tuning with AFC. Sensitivity: 2-3µV for 20dB quieting. Aerial input: 70-80 ohms coaxial. Output: 0-1V via emitter follower. Controls: tuning, volume, mains on/off push-button. Crosstalk: better than 30dB at 1kHz. AFC hold: 400kHz. Bandwidth: 210kHz. IF: 10.7MHz. FET tuner. Stereo decoder included. Automatic stereo switching. Stereo beacon. Size: (chassis) 3¼ × 11 × 7½in; (cabinet) 5¼ × 13 × 9in. Weight: (chassis) 6lb; (cabinet model) 9lb. Prices: (complete with stereo decoder and cabinet) £37.99; (in cabinet but less decoder) £31.45; (chassis with decoder) £35.06; (chassis less decoder) £28.69. All prices include PT. Stereo decoder separately: £8 (no PT).

# VHF RADIO TRANSMITTING STATIONS



## B.B.C. Local Radio Stations

Station	Frequency (MHz)	Maximum E.R.P.	Station	Frequency (MHz)	Maximum E.R.P.
Birmingham	95.6	5.5kW	Medway	97.0	5.5kW
Blackburn	96.4*	1.5kW	Merseyside	95.85	2.5kW
Brighton	95.8	500W	Newcastle	95.4	3.5kW
Bristol	95.1	5kW	Nottingham	94.8*	200W
Derby	96.5*	5.5kW	Oxford	95.0	4.5kW
Durham	94.5	2.6kW	Sheffield	88.6	30W
Humberside	95.3	4.5kW	Rotherham†	95.05	9W
Leeds	94.6	140W	Solent	96.1	5kW
Leicester	95.2	140W	Stoke-on-Trent	94.6	2.5kW
London	95.3	16.5kW	Teesside	96.6	5kW
Manchester					

\*Slant polarization; all other transmissions use horizontal polarization

†Relay.

# FOUR!



Four is the sound of the future, the incredibly life-like sound of 4-channel stereo. And it's yours today in the MCA-V7E, a revolutionary 4-channel integrated amplifier from JVC NIVICO.

For less than you'd pay for many conventional 2-channel stereo amplifiers, this single component opens the future for you in four big ways.

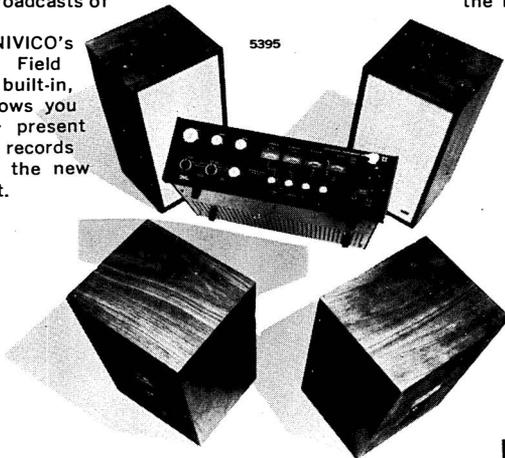
**ONE**, as a full-fledged 60 watt 4-channel integrated amplifier, the MCA-V7E prepares you for all the discrete 4-channel stereo tapes, records and FM broadcasts of the future.

**TWO**, with JVC NIVICO's exclusive Sound Field Composer (SFC) built-in, the MCA-V7E allows you to convert your present 2-channel stereo records and tapes into the new 4-channel format.

**THREE**, it incorporates a BTL (Balanced-Transformer-Less) circuit which enables it to be used as a 90 watt regular 2-channel stereo amplifier. So in one inexpensive component you have a 90 watt 2-channel amplifier, a 60 watt 4-channel amplifier with a 2-channel to 4-channel conversion capability, and a 60 watt 4-channel amplifier with a capability of reproducing tapes, records and broadcasts especially prepared for 4-channel reproduction.

**FOUR**, No other 4-channel system now on the market offers so much. Or makes it so easy to start building for the new age of 4-channel stereo.

Make no mistake about it, four is the sound of the future in stereo and JVC NIVICO's MCA-V7E makes you very much a part of it today.



**JVC**  
**NIVICO**

VICTOR COMPANY OF JAPAN LTD.

**DENHAM & MORLEY** (OVERSEAS) LTD., 453 CALEDONIAN RD., LONDON, N.7. TEL: 607 6568

# TELEFUNKEN



## PRESENT THE CONCERTO Hi-Fi 101



A top-flight Hi-Fi tuner-amplifier. 5 wavebands :

FM, SW, MW<sub>1</sub> = 1415–1610 kHz (European waveband MW<sub>2</sub> = 520–1420 kHz),

LW. 7 FM stations buttons. Electronic frequency indicator with instrument.

2 x 30 watts music power (which corresponds to 2 x 22 watts continuous output power). Built-in equaliser/preamplifier. Separate sockets for pick-up (crystal) pick-up (magnetic), tape recorder. Illuminated indicator for stereo operation.

Noise filter. FM fine tuning (AFC). Floodlit dial.

Frequency response. 20–20,000 Hz.

Cabinet : light-matt walnut, pearl-white or rosewood.

Dimensions (W/H/D) : 25" x 4" x 10½" (63 x 10 x 26.5 cm).

## ONE OF TELEFUNKENS MANY HIGH-FIDELITY PRODUCTS

*For further information please write to:*

### TELEFUNKEN QUALITY PRODUCTS

AEG (Great Britain) Ltd. AEG House, Chichester Rents,  
Chancery Lane, W.C.2. Telephone : 01-242 9944.

# Directory of Tuner/ Amplifiers

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ ACOUSTIC RESEARCH

Distributors: Bell & Howell Ltd,  
Audio Products Division, Alpertown House,  
Bridgewater Road, Alpertown, Middlesex,  
HA0 1EG.

Tel: 01-902 8812. Telex: 261378.

### AR Tuner Amplifier ★

FM stereo tuner/amplifier. Range: FM 88-108 MHz. Variable tuning. FET front end and multi-section crystal filter IF amplifier. Tuning meter. Sensitivity:  $1\mu\text{V}$  for 20dB quieting. Aerial input: 300 ohms balanced. Stereo decoder fitted. Inter-station quiet tuning. S/N 65dB. IC IF amplifier. De-emphasis switchable  $50\mu\text{Sec}$  or  $75\mu\text{Sec}$ . Inputs: magnetic PU 2.5mV (adjustable) 50K, tape 200mV 150K, aux 200mV 150K. Noise level: PU input 57dB, other inputs 75dB. Controls: bass, treble, volume, balance, input selector, tuning, mains on-off, speaker/headphones. Output: 60W RMS. HD:  $<0.5\%$  at rated output. FR: 20Hz-20kHz  $\pm 1\text{dB}$ . Output impedance: 4-16 ohms. Mains: 100, 120, 220, 240V 50/60Hz. Finish: wood case with brushed aluminium panel and spun knobs. Size:  $17\frac{1}{4} \times 6 \times 11\frac{1}{8}\text{in}$ . Price: £300.25 (plus £80.50 PT).

## ■ AKAI

UK distributors: Rank Audio Products,  
PO Box 70, Great West Road, Brentford, Middx.  
Tel: 01-568 9222. Telex: 24408.

### AA6600 ★

Stereo AM/FM. Range: FM 88-108MHz, AM 187-565m. Variable tuning. One signal strength meter, one centre zero tuning meter. Sensitivity: FM  $2\mu\text{V}$ , AM  $20\mu\text{V}$ . Aerial input: 300 ohms balanced, 75 ohms coaxial. Stereo decoder fitted. AFC. FET front end. Integrated circuits incorporated. Inputs: mag PU 3mV, aux 200mV, tape monitor 200mV. Output: 35W RMS per channel. HD: 0.8% at rated output. FR: 20Hz-50kHz -3dB. Output impedance: 4-16 ohms. Mains: 100-240V AC. Size:  $5\frac{1}{4} \times 17\frac{1}{2} \times 13\frac{3}{8}\text{in}$ . Four-way speaker outlets. Price: £114 (plus £28.53 PT).

### AA6200 ★

AM/FM stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-560 metres. Variable tuning. Meter tuning indicator. Sensitivity: (FM)  $2.5\mu\text{V}$  for 20dB quieting, (AM)  $250\mu\text{V}$ . Aerial input: 75 ohms coaxial and 300 ohms balanced. Stereo decoder fitted. FET and IC. Inputs: mag PU 3mV, aux 200mV, tape 200mV. Noise level: (mag PU) -60dB, (other inputs) -65dB. Controls: bass  $\pm 10\text{dB}$ , treble  $\pm 10\text{dB}$ , loudness +7dB at 100Hz, +4dB at 10kHz. Output: 15W RMS per channel into 4 ohms, 10W RMS per channel into 8 ohms. HD: 0.2% at 8W RMS into 8 ohms. FR: 20Hz-50kHz -3dB. Output impedance: 8 ohms. Mains: 100-240V AC. Size:  $16\frac{3}{8} \times 5 \times 11\text{in}$ . Price: £76 (plus £19.02 PT).

### AA6300

AM/FM stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-560 metres. Variable tuning. Meter tuning indicator. Sensitivity: (FM)  $2\mu\text{V}$  for 20dB quieting, (AM)  $150\mu\text{V}$ . Aerial input: 75 ohms coaxial and 300 ohms balanced. Stereo decoder fitted. FET and IC. Auto stereo switching. Inputs: mag PU 3mV, aux 150mV, tape 200mV. Noise level: (mag PU) -60dB, (other inputs) -70dB. Controls: bass  $\pm 10\text{dB}$ , treble  $\pm 10\text{dB}$ , Loudness +6dB at 100Hz, +6dB at 10kHz. Output: 20W RMS per channel. HD: 0.15% at 15W into 8 ohms. FR: 20Hz-40kHz -3dB at 8 ohms. Output impedance: 4, 8, 16 ohms. Speaker switching: A plus B, A or B. Mains: 100-240V AC. Size:  $17\frac{1}{2} \times 5\frac{3}{4} \times 13\frac{1}{2}\text{in}$ . Price: £103.05 (plus £25.79 PT).

### AA8500 ★

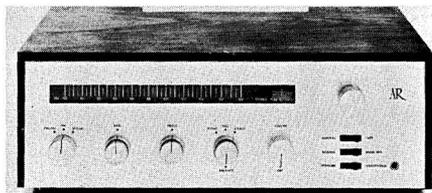
AM/FM stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-560 metres. Variable tuning with special graphic scale. Two tuning meters. Sensitivity: (FM)  $2\mu\text{V}$  for 20dB quieting, (AM)  $100\mu\text{V}$ . Aerial input: 75 ohms coaxial, 300 ohms balanced. Stereo decoder fitted. AFC. FET and IC. Inputs: mag PU 3mV 50K, aux 150mV 50K, mic 0.77mV 100K, tape 200mV 50K, tape 200mV 50K. Noise level: (mag PU) -70dB, (other inputs) -80dB. Controls: bass  $\pm 10\text{dB}$ , treble  $\pm 10\text{dB}$ , loudness +8dB at 100Hz, +4dB at 10kHz. Scratch filter -5dB at 10kHz. Rumble filter -9dB at 100Hz. Output: 85W RMS per channel into 4 ohms, 65W RMS per channel into 8 ohms. HD: 0.05% at 30W. FR: 20Hz-50kHz. Output impedance: 4, 8, 16 ohms. Mains: 100-240V AC. Size:  $19\frac{1}{4} \times 7 \times 14\frac{1}{2}\text{in}$ . Slider balance and volume. Price: £184.15 (plus £45.83 PT).

## ■ ALPHA

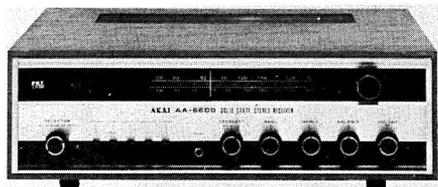
Highgate Acoustics Ltd,  
184-188 Great Portland Street, London, W1.  
Tel: 01-636 2901.

### R150 ★

Stereo tuner/amplifier. Range: 87-108MHz,



Acoustic Research tuner/amplifier



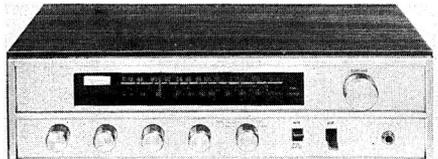
Akai AA6600



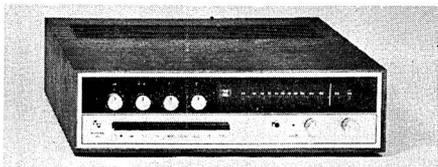
Akai AA6200



Akai AA8500



Alpha R150



Armstrong Audio 525

187-572 metres. Variable tuning. FM ratio detector. Meter tuning indicator. Sensitivity:  $2\mu\text{V}$  for 20dB quieting. Aerial input: 300 ohm balanced. Stereo decoder fitted. AFC. Inputs: magnetic PU 3mV, crystal PU 250mV, aux 250mV. Output: 8W RMS per channel. HD: 0.5% at rated output. FR: 30Hz-30kHz. Output impedance: 8 ohms. Mains: 117, 220, 240V AC. Size:  $15\frac{1}{2} \times 4\frac{1}{4} \times 10\frac{1}{2}$ in. Price: £47.63 (plus £10.37 PT).

#### R200

Stereo tuner/amplifier. Range: 87-108MHz, 187-572 metres. Variable tuning. FM ratio detector. Meter tuning indicator. Sensitivity:  $3\mu\text{V}$  for 20dB quieting. Aerial input: 300 ohms balanced. Stereo decoder fitted. AFC. Inputs: magnetic PU 3mV, crystal PU 250mV, aux 250mV. Output: 10W per channel. HD: 0.5% at 10W. FR: 30Hz-30kHz. Output impedance: 8 ohms. Mains: 117, 220, 240V AC. Slider controls for bass, treble and volume. Size:  $15\frac{1}{2} \times 4\frac{1}{4} \times 10\frac{1}{2}$ in. Price: £61.59 (plus £13.41 PT).

#### R500

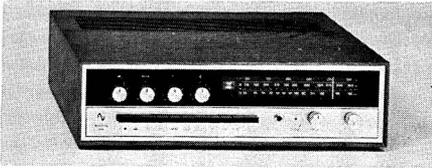
Stereo tuner/amplifier. Range: 87-108MHz, 187-572 metres. Variable tuning. FM ratio detector. Meter tuning indicator. Sensitivity:  $2\mu\text{V}$  for 30dB S/N. Aerial input: 300 ohms balanced. Stereo decoder fitted. AFC. Inputs: magnetic PU 3mV, ceramic PU 250mV, tape recorder 200mV, aux 200mV. Output: 12W RMS per channel. HD: 0.5% at 12W. FR: 20Hz-35kHz. Output impedance: 8 ohms. Mains: 117, 220, 240V AC. Size:  $12\frac{1}{2} \times 5\frac{1}{4} \times 5\frac{1}{2}$ in. Price: £68.16 (plus £14.84 PT).

#### ■ ARMSTRONG AUDIO LTD

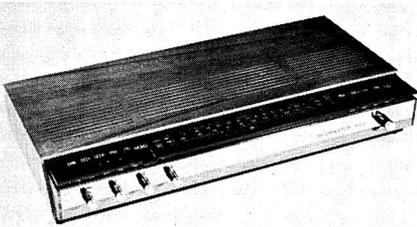
Warlters Road, London, N7. Tel: 01-607 3213.

#### Model 525 ★

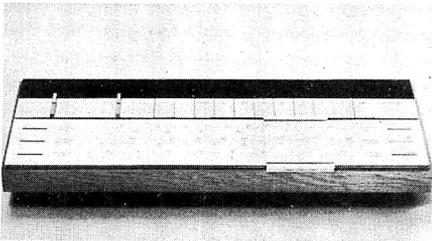
FM. Range: VHF 86-109MHz. Variable tuning. Ratio detector. Meter tuning indicator. Sensitivity:  $1.5\mu\text{V}$  for 30dB quieting. Aerial impedance: 75 ohms coaxial and 300 ohms balanced. Plug-in stereo multiplex decoder optional extra (see Radio Tuner Section). Quiet-tuning control. Stereo indicator light. Inputs: PU(1) 60mV 100K, PU(2) 3.5mV 50K, tape play 400mV 100K. Noise level: PU -55dB, tape -70dB. Controls: balance (maximum to zero each channel), bass  $\pm 10\text{dB}$ , treble  $\pm 10\text{dB}$ , loudness (two volume levels with loudness contours at low level), rumble filter -5dB at 30Hz, treble filter (1) 6.5kHz -3dB, 10kHz -25dB, treble filter (2) 4.5kHz -3dB, 9kHz -40dB. Output: 25W RMS per channel. Output impedance 4-16 ohms. HD <0.5% at rated output. FR 20Hz-20kHz -1dB at 25W RMS. Transistorised. Mains: 100-125V and 200-250V AC. Size:  $17 \times 10\frac{1}{2} \times 4\frac{1}{2}$ in. Price: £73.50 (plus £18.39 PT).



Armstrong Audio 526



Bang & Olufsen Beomaster 1000



Bang & Olufsen Beomaster 1200

**Model 526 ★**

AM/FM. Range: VHF 86-109MHz, MW 185-590 metres, LW 1,000-2,000 metres. Variable tuning. FM ratio detector. Meter tuning indicator. Sensitivity: 1.5µV for 30dB quieting on VHF, 5µV for 20dB quieting on AM. Aerial impedance: 75 ohms coaxial and 300 ohms balanced. Plug-in stereo multiplex decoder optional extra (see Radio Tuner Section). FM quiet-tuning control. Stereo indicator light. Inputs: PU(1) 60mV 100K, PU(2) 3.5mV 50K, tape play 400mV 100K. Noise level: PU -55dB, tape -70dB. Controls: balance (maximum to zero each channel), bass ±10dB, treble ±10dB, loudness (two volume levels with loudness contours at low level), rumble filter -5dB at 30Hz. Treble filter (1) 6.5kHz -3dB, 10kHz -25dB, treble filter (2) 4.5kHz -3dB, 9kHz -40dB. Output: 25W RMS per channel. Output impedance: 4-16 ohms. HD <0.5% at rated output. FR 20Hz-20kHz -1dB at 25W RMS. Transistorised. Mains: 100-125V and 200-250V AC.

Size: 17 × 10 $\frac{3}{4}$  × 4 $\frac{3}{8}$ in. Price: £83.75 (plus £20.96 PT).

■ **AVERINE ELECTRONICS**

PO Box No. 6, Ruislip, Middlesex.

**STA60**

Stereo tuner/amplifier. Range: 88-108MHz. Variable tuning. AFC. Coincidence gate FM detector. Centre-zero tuning meter. Sensitivity: 1µV for 20dB quieting. Aerial input impedance: 75 ohms coaxial. Stereo decoder fitted. Separation: 40dB at 1kHz. Interchannel muting. FET front end. ICs and ceramic filters in IF amplifier. Stereo beacon. Inputs: magnetic PU: 2.5mV 47K, radio 250mV 100K, aux 250mV 100K. Noise level: (mag PU) -68dB, (other inputs) -80dB. Controls: volume and on-off, treble, bass, balance, low pass filter 12dB/octave (3dB at 7kHz), mono/stereo, tuning. Output: 30W RMS per channel. HD: <0.1% at rated output and lower levels. FR: 20Hz-20kHz ±1dB at full output. Output impedance: 8 ohms. Size: 15 $\frac{1}{2}$  × 9 × 3 $\frac{1}{2}$ in. AC mains 240V 50/60Hz. Price: to be announced.

■ **BANG & OLUFSEN UK LTD**

Eastbrook Road, Gloucester, GL47DE.

Tel: Gloucester 21591.

**Beomaster 1000 ★**

Stereo 15W per channel. Range: 87.5-108MHz. Variable tuning. Ratio detector. Tuning meter. Sensitivity: 2.5µV for 26dB quieting. Aerial impedance: 75 ohms coax. Multiplex decoder optional extra. AFC. A-B monitoring. FR 30Hz-20kHz ±2dB. Amplifier noise level -53dB at 50mW. Output impedance 4 ohms. Inputs: PU (1) 200mV 470K, PU (2) 4mV 47K, tape 200mV 470K. Controls: on/off, speakers, hi filter, low filter, mono, tuner, AFC, gram I and II, tape, volume, bass, treble, balance, tuning. Psn mains. Size: 19 $\frac{3}{8}$  × 3 $\frac{1}{2}$  × 10in. Price: (teak) £95 (including PT); (rosewood) £96 (including PT). Decoder £9.75 extra.

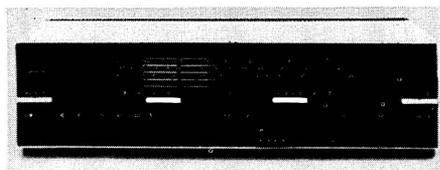
**Beomaster 1200 ★**

Stereo, transistorised, 15W per channel. Ranges: 87.5-104MHz, 184-578m, 857-2,040m. Variable tuning plus 3 FM presets. Lamp indicator. Sensitivity: 1.5µV for 26dB S/N on FM. Ratio detector. Decoder fitted. Switched AFC. Aerial: 75 ohms IEC. FR (±1 $\frac{1}{2}$ dB): 20Hz-40kHz. HD: less than 1% at 2 × 15W; N level -65dB. Inputs: switched PU, magnetic 4mV 47K and crystal 200mV 470K, tape 200mV 470K. Outputs: tape 100mV 100K, headphones 100 ohms nominal, speakers 4 ohms. Controls: wide cursor tuning, slider volume and tone, bass, treble. Features include: use of FETs, speaker s/c proof, built-in tilt bracket. Mains: 110, 130, 220, 240V 50/60 Hz. Dimensions: 21.4 × 8.1 × 3.1in. Price: (teak) £109.75; (rosewood) £110.75 (including PT).

★ Indicates entry is illustrated

### Beomaster 1600M ★

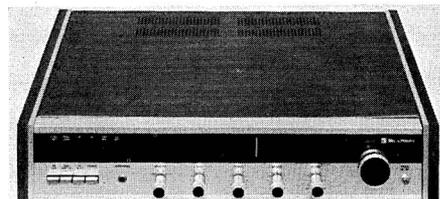
Stereo, transistorised. 15W per channel. Ranges: 87.5-104MHz, 16-49m, 66.6-200m, 188-578m, 857-2,040m. Variable tuning plus 4 FM presets. Meter indicator. Sensitivity:  $2\mu\text{V}$  for 26dB quieting on FM. Decoder fitted. Ratio detector. Switched AFC. Aerial: 75 ohms IEC. FR ( $\pm 1\text{dB}$ ): 30Hz-25kHz. HD: less than 1% at  $2\times 15\text{W}$ ; N level better than 50dB. Inputs: magnetic PU 4mV 47K, tape 200mV 500K. Output impedance: 4 ohms. Controls: sliders for volume, bass and treble; balance, wavebands and presets, mono, speakers, ext aerial and AFC, bass, treble. Features include: FETs and ceramic filters. Mains: 110, 130, 220, 240V 50/60Hz. Dimensions:  $16\frac{1}{4} \times 9\frac{5}{8} \times 4\frac{3}{8}$  in. Price: (teak) £126.50; (rosewood) £127.50 (including PT).



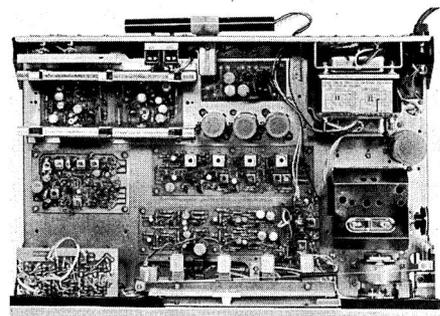
Bang & Olufsen Beomaster 1600

### Beomaster 3000

Stereo, transistorised. 38W per channel. Range: 87.5-108MHz. Variable tuning plus 6 presets. Meter indicator and two illuminated panels. Decoder fitted. Ratio detector. Switched AFC. Aerial: IEC sockets for 75 ohms and 240 ohms. FR ( $\pm 1\text{dB}$ ): 40Hz-20kHz. HD: 0.3%; N level -65dB. Inputs: magnetic PU variable 1.5-100 mV 47K, crystal/ceramic variable 200mV-3V 1M, tape variable 200mV-3V 1M. Controls: tuning and presets, volume, balance, mono L, mono R, speakers pair 1, speakers pair 2, low filter (80Hz 12dB octave), high filter (4kHz 12dB per octave), bass  $\pm 17\text{dB}$  at 50Hz, treble  $\pm 14\text{dB}$  at 10kHz. Features include: FETs, ceramic filters, integrated circuits, special tuning device, variable input sensitivities, slider controls. Mains: 110, 130, 220, 240V 50/60Hz. Dimensions:  $22\frac{3}{4} \times 10\frac{1}{4} \times 3\frac{3}{8}$  in. Prices: (teak) £143.50; (rosewood) £144.50 (including PT).



Bell & Howell 3600



Bell & Howell 3600 (inside view)

## ■ BELL & HOWELL LTD

Alperton House, Bridgewater Road,  
Alperton, Middlesex, HA0 1EG.  
Tel: 01-902 8812. Telex: 261378.

### Design 3600 ★

AM/FM stereo integrated tuner/amplifier. Range: FM 87-108MHz, MW 186-565 metres. Variable tuning with AFC on FM. FM ratio detector. Meter tuning indicator. Sensitivity:  $2\mu\text{V}$  for 20dB quieting. Aerial input: 300 ohms balanced. Stereo decoder fitted. Switch for inter-station muting. Ferrite rod aerial for AM. Stereo beacon. FET front end. Inputs: magnetic PU 2mV 50K, ceramic PU 50mV 400K, aux 200mV 50K, tape 200mV 1K. Output: 15W RMS per channel. HD: 0.3% at 15W. FR: 20Hz-20kHz  $\pm 3\text{dB}$  at 15W. Noise level:  $< 50\text{dB}$ . Output impedance: 8 ohms. Mains: 110-120V and 220-240V AC. Size:  $19\frac{1}{2} \times 12.5 \times 4$  in. Price: £60.56 (plus £14.44 PT).



Duette SAT260



Duette SAT460

### ■ BRYAN AMPLIFIERS LTD

18 Greenacres Road, Oldham, Lancs.

Tel: 061-624 4074.

#### 6000

Solid state stereo tuner/amplifier. Range: 88.5-108MHz. Variable tuning with meter indication. FM detector: ratio. Sensitivity:  $2\mu\text{V}$ . Aerial impedance: 80 ohms coaxial. Output voltage: 150mV at 30% modulation. Multiplex decoder fitted. AFC. Power output: 20W per channel RMS, 4-15 ohms. HD 0.25%. FR 35Hz-33kHz at 1W  $\pm 1\text{dB}$ . Feedback -60dB. Inputs: magnetic pickup, 3mV, 50K, noise level 60 to 70dB; ceramic pick up, 40mV, 100K, noise level -52 to 60dB; radio, tape and aux, 75mV, 50K, -60 to 70dB. Controls: volume and on-off; balance; bass; treble; selector; mode; monitor; rumble filter. Psn mains. Dimensions:  $17\frac{1}{4} \times 12 \times 5\frac{3}{4}$ in. Price: £82.80 (plus £20.25 PT); (chassis model) £77.65 (plus £19.25 PT).

### ■ DUAL ELECTRONICS LTD

St-Georgen House, Mill Road, Stokenchurch, High Wycombe, Bucks. Tel: Radnage 3467/8.

#### CR50

AM/FM stereo tuner/amplifier. Range: LW, MW, SW1, SW2 and VHF. Aerial input: 240 ohms balanced. Sensitivity: (stereo)  $8\mu\text{V}$ , (mono)  $1.5\mu\text{V}$ . Stereo decoder fitted. Stereo beacon. Automatic stereo switching. Five preset tuning buttons plus variable tuning. Tuning meter. Output: 18W RMS per channel into 4 ohms. FR: 20Hz-40kHz  $\pm 0.6\text{dB}$ . HD:  $< 0.3\%$  at 1kHz at 18W. Inputs: magnetic PU, ceramic PU, tape. Size:  $16\frac{1}{2} \times 4\frac{1}{4} \times 11\frac{1}{4}$ in. Price: to be announced.

### ■ DUETTE

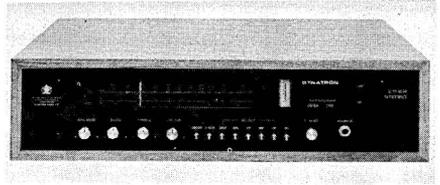
Distributors: J. J. Silber Ltd,  
11 Northburgh Street, London, EC1.  
Tel: 01-253 8031.

#### SAT260 ★

Stereo tuner/amplifier. Range: 88-108MHz, 187-560m. Variable tuning. AFC. Foster-Seeley discriminator. Meter tuning indicator. Sensitivity: FM  $3-5\mu\text{V}$ , AM  $10\mu\text{V}$ . Aerial impedance: 80 ohms. Stereo decoder fitted. Output: 12W RMS per channel. HD:  $< 1\%$  at rated output. FR: 20Hz-25kHz  $\pm 0.5\text{dB}$ . Noise level: -55dB. Inputs: mag PU 3mV, crystal PU 50mV, aux 200mV, tape 200mV. Output impedance: 4, 8, 16 ohms. Size:  $3\frac{7}{8} \times 14\frac{1}{2} \times 11$ in. Mains: 240V AC. Price: £59.10 (plus £14.79 PT).

#### SAT460 ★

Stereo tuner/amplifier. Range: 88-108MHz, 187-560m. Variable tuning. AFC. Foster-Seeley discriminator. Meter tuning indicator. Sensitivity: FM  $2\mu\text{V}$  for 20dB quieting, AM  $10\mu\text{V}$  for



Dynatron TVR26



Dynatron STA90

10dB quieting. Aerial impedance: 80 ohms. Stereo decoder fitted. Output: 12W RMS per channel. HD:  $< 1\%$  at rated output. FR: 20Hz-25kHz  $\pm 0.5\text{dB}$ . Noise level: -55dB. Inputs: mag PU 3mV, tape 200mV, aux 200mV. Output impedance: 4, 8, 16 ohms. Size:  $4\frac{1}{2} \times 16\frac{1}{2} \times 11\frac{1}{2}$ in. Mains: 240V AC. Price: £79.73 (plus £19.96 PT).

### ■ DYNATRON RADIO LTD

St Peters Road, Furze Platt, Maidenhead, Berks. Tel: Maidenhead 23331.

#### TVR26 ★

Stereo transistorised AM/FM tuner/amplifier. Ranges: 87-108MHz, MW 185-570m, LW 1100-2000m. Variable tuning. Ratio detector. Meter tuning indicator. Sensitivity:  $5\mu\text{V}$  for 20dB quieting. Aerial input VHF: 75 ohms coaxial. Stereo decoder fitted. AFC. Output: 8W per channel at less than 1% distortion. FR: ( $\pm 3\text{dB}$ ) 40Hz-16kHz at  $\frac{1}{2}$ W. Noise level -90dB. Output impedances: speakers 4 ohms, earphones 8 ohms or greater. Inputs: tape 35mV 20K, noise level -70dB; crystal PU 75mV 100K (special correction), noise level -60dB; magnetic PU 5mV, noise level -60dB. Controls: tuning, balance, input selector, bass, treble, volume, loudness, AFC, filter, on/off. Price:  $19 \times 14 \times 5\frac{1}{4}$ in. Mains: 240V AC only. Price: £88 (inc. PT).

#### STA90 ★

Stereo transistorised AM/FM tuner/amplifier. Range: FM (manual tuning) 87-101MHz, (preset tuning) 87.5-108MHz; MW 185-570 metres; LW 1100-2000 metres. AFC incorporated. Controls: mains on-off, high filter, low filter, balance, volume, bass, treble, loudness contour, tape monitor, stereo/mono, channel reverse, tuning, four preset station buttons, input selector buttons, speaker switching (A, A+B, B). Output:

★ Indicates entry is illustrated

45W RMS per channel. FR: 30Hz-20kHz  $\pm$  1dB. Output impedance: 3-16 ohms. HD: 0.2% at 0.5dB below rated output into 4-16 ohm load. Size: 19 $\frac{1}{4}$   $\times$  16 $\frac{1}{2}$   $\times$  5 $\frac{1}{2}$ in. Finish: teak veneer with black control panel and bright trim. Price: £133.55 (plus £31.45 PT).

### ■ EAGLE INTERNATIONAL

Heather Park Drive, Wembley, HA1 1SU.

Tel: 01-903 0144.

#### SMC10

Stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-560m. Stereo decoder fitted. Output: 3.5W per channel. FR 30Hz-18kHz. S/N better than 50dB. Inputs: PU 250mV, tape 300mV. Size: 6 $\frac{1}{4}$   $\times$  15  $\times$  9 $\frac{3}{4}$ in. Price: £32.85 (plus £8.10 PT).

#### SMC20 ★

Stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-560m. Stereo decoder fitted. Output: 5W RMS per channel. FR 25Hz-20kHz. S/N better than 55dB. Inputs: PU 250mV, tape 300mV. Designed to accommodate Garrard 20 Series gram unit which drops into optional cut-out in top of cabinet. Size: 5 $\frac{1}{8}$   $\times$  16 $\frac{1}{2}$   $\times$  15 $\frac{3}{4}$ in. Price: £52.12 (plus £12.88 PT).

#### SMC60 ★

Stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-560m. Stereo decoder fitted. Output: 15W RMS per channel. FR 25Hz-25kHz. S/N better than 55dB. Inputs: mag PU 3mV, tape 300mV. Designed to accommodate Garrard gram unit which drops into optional cut-out in top of cabinet. Size: 5 $\frac{1}{8}$   $\times$  16 $\frac{1}{2}$   $\times$  15 $\frac{3}{4}$ in. Price: £76.29 (plus £18.71 PT).

### ■ FANTAVOX

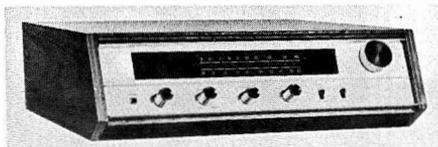
Distributors: Lasky's Radio Ltd,  
3-15 Cavell Street, Tower Hamlets,  
London, E1 2BN. Tel: 01-790 4821.

#### SR-542 ★

Stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-560m. Sensitivity: FM 10 $\mu$ V for 500 mW. SN: FM 50dB, AM 35dB. Output: 5W RMS per channel. FR: 50Hz-15kHz. Inputs: mag PU 5mV, ceramic PU 40mV, aux 200mV. Bass control:  $\pm$  10dB at 50Hz. Treble control:  $\pm$  10dB at 10kHz. Output impedance: 8 ohms. Mains: 240V 50Hz. Consumption: 40VA. Size: 4  $\times$  16 $\frac{3}{8}$   $\times$  8 $\frac{1}{2}$ in. Weight: 11 $\frac{1}{2}$ lb. Price: £32 (including PT).

#### SR-544 ★

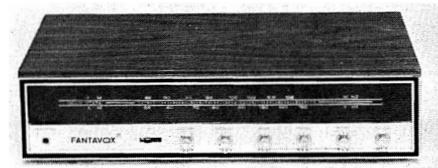
Stereo/amplifier incorporating digital alarm clock. Range: FM 88-108MHz, MW 187-560m. Sensitivity: FM 10 $\mu$ V for 500mW, AM 300 $\mu$ V for 500mW. SN: FM 50dB, AM 35dB. Output: 5W RMS per channel. FR: 50Hz-15 kHz. Inputs: mag PU 5mV, ceramic PU 40mV,



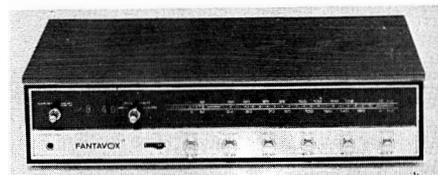
Eagle SMC20



Eagle SMC60



Fantavox SR-542



Fantavox SR-544

aux 200mV. Bass control:  $\pm$  10dB at 50Hz. Treble control:  $\pm$  10dB at 10kHz. Output impedance: 8 ohms. Mains: 230-250V 50Hz. Consumption: 40VA. Size: 4  $\times$  16 $\frac{3}{8}$   $\times$  8 $\frac{1}{2}$ in. Weight: 11 $\frac{1}{2}$ lb. Price: £37.50 (inc. PT).

### ■ FARNELL

A. C. Farnell Ltd, Farnell House,  
81 Kirkstall Road, Leeds. Tel: Leeds 35111.

#### Farnell F2100

Stereo tuner/amplifier. Range: FM 88-108 MHz, MW 187-555m. Variable tuning. Meter tuning indicator. Sensitivity 15 $\mu$ V for 30dB quieting. Aerial input (FM) 300 ohms balanced. Ferrite rod for AM. Output: 4.5W RMS per channel. Stereo decoder fitted. AFC. Mains: 110-220V AC. Size: 4 $\frac{1}{2}$   $\times$  16 $\frac{1}{2}$   $\times$  10in. Price: £40 (plus £9.87 $\frac{1}{2}$ ).

### ■ GOODMAN'S LOUDSPEAKERS LTD

Downley Road, Havant, Hampshire, PO9 2NL.  
Tel: Havant 6344. Telex: 86296.

#### Module 80

FM stereo tuner/amplifier. Range: 87-108MHz.

Variable tuning with switchable AFC. Tuning indicator. Stereo decoder fitted. Automatic stereo beacon. Aerial input: 240-300 ohms balanced. Inputs: magnetic PU 2mV 50K, aux and crystal PU 60mV 600K, tape play 320mV 50K. Controls: mains on-off and speaker selector, balance, treble +10dB -17dB at 10kHz, bass  $\pm$ 13dB at 50Hz, volume, HF filter -11dB at 16kHz, LF filter -11dB at 25Hz, loudness +11dB at 50Hz and +6dB at 10kHz (with volume control retarded 30dB), left-right reverse, stereo/mono, tape play and monitor, tuning, input selector buttons, AFC on-off. Output: 35W RMS per channel into 4 ohms. HD: <0.1% at 30W per channel. FR: 30Hz-20kHz  $\pm$ 1.5dB. Damping factor: (4 ohm load) 40; (8 ohm load) 80; (15 ohm load) 150. Socket for stereo phones. DIN sockets for two sets of speakers. AC mains outlet socket. H and N: 80dB below 35W on tape/aux input, 66dB below 35W on magnetic PU input. Crosstalk between channels: better than 45dB 40Hz-13kHz. FM radio sensitivity: better than 1.5 $\mu$ V for 26dB S/N. Pilot tone rejection: -36dB at 19kHz and 38kHz (ref 0dB at 67kHz deviation). 68 semi-conductors (including two FETs). Size: 22  $\times$  3 $\frac{1}{2}$   $\times$  11 $\frac{1}{2}$ in. Mains: 120V, 220V or 240V AC. Consumption: 150W maximum. Price: £95 (including PT).

### ■ GRUNDIG (Great Britain) LTD

Hi-Fi Division, 15 Orchard Street, London, W1.  
Tel: 01-935 4898.

#### RTV400 ★

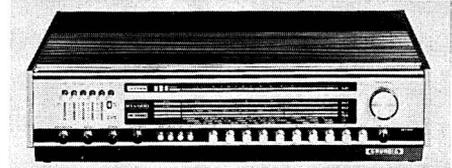
Transistorised stereo tuner/amplifier. 43 transistors, 37 diodes. Range: VHF 87.5-108MHz, LW 680-2050m, MW 185-587m, SW 18.5-55.6m. Eight FM station pre-selectors. Output: 20W RMS per channel. Output impedance: 4-16 ohms. HD: 0.5% at rated output. FR: (audio stages) 40Hz-16kHz  $\pm$ 1.5dB. Stereo decoder fitted. Automatic stereo switching. Stereo beacon. Aerials: internal ferrite rod for AM, FM dipole 240 ohms. Sensitivity: FM 2 $\mu$ V, MW 15 $\mu$ V, SW 3-5 $\mu$ V. IFs: 460kHz and 10.7MHz. AFC. Stereo separation: >35dB at 1kHz. Inputs: mag PU 3mV 47K, crystal PU 200mV, tape 200mV. Noise level: (tape socket) -80dB, (mag PU socket) -55dB. Bass control: -20dB +13dB at 40Hz. Treble control: -15dB +13dB at 16kHz. Balance control: +3dB -10dB. Automatic overload cut-out. Size: 4 $\frac{1}{4}$   $\times$  22  $\times$  11in. Price: £173-70 (including PT).

#### RTV650 ★

Transistorised stereo. Ranges: VHF 87.5-108MHz, LW 680-2050m, MW 185-587m, SW1 34-99m, SW2 13.5-35m, SW fine tuning  $\pm$ 60kHz of SW bands. Sensitivity: FM 1.4 $\mu$ V, AM (MW) 6.5 $\mu$ V. IFs: 460kHz and 10.7MHz. AFC.



Grundig RTV400



Grundig RT650

Noise level: -73dB at 40kHz deviation. Distortion factor: <0.5%. FR 40Hz-15kHz  $\pm$ 2dB. Stereo decoder with automatic switching and stereo beacon. Separation: better than 40dB at 2kHz. Aerials: internal ferrite rod, FM dipole 240 ohms. 3kHz and 5kHz treble filters. Output: 20W RMS per channel. FR (audio stages) 20Hz-20kHz  $\pm$ 1.5dB. Inputs: mag PU 3mV 47K, tape 200mV 470K. Output impedance: 4-16 ohms. Automatic overload cut-out. Bass control: -20dB +15dB at 20Hz. Treble control: -20dB +15dB at 20kHz. Mains: 110, 130, 220, 240V 50-60Hz. Consumption (no load): 30W. Size: 24  $\times$  6  $\times$  12in. Price: £244.50.

### ■ HEATHKIT

See Constructional Kits Section.

### ■ HECO

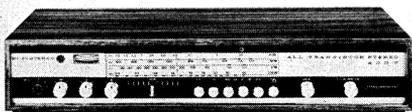
Distributors: Acoustico Enterprises Ltd,  
6-8 Union Street, Kingston-upon-Thames,  
Surrey. Tel: 01-549 3471/3.

#### Heco 90

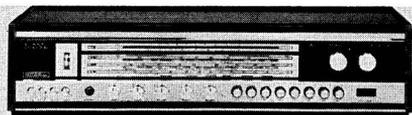
Stereo tuner/amplifier. Range: 87.5-108MHz. Three preset tuning buttons. Switchable AFC. Ratio detector. Sensitivity: 5 $\mu$ V for 30dB S/N. Aerial input: 240 ohms balanced. Stereo decoder fitted. Inputs: magnetic PU 2.4mV 47K, ceramic PU 200mV; radio 250mV 100K, tape 250mV 100K. Tone controls: bass  $\pm$ 14dB at 30Hz, treble  $\pm$ 16dB at 20kHz. Output: 30W RMS per channel. Mains: 110/220V 50/60Hz. Size: 16 $\frac{1}{4}$   $\times$  4 $\frac{3}{8}$   $\times$  10 $\frac{3}{8}$ in. Price: on application.

### ■ HITACHI SALES (UK) LTD

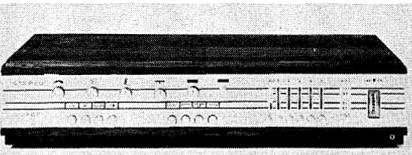
Park House, Coronation Road, Park Royal,  
London, NW97QS.  
Tel: 01-965 9861. Telex: 923268.



Korting Stereo 400T



Korting Stereo 1000L



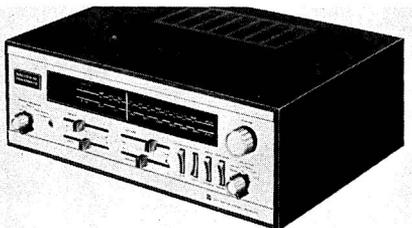
Luxor 4988



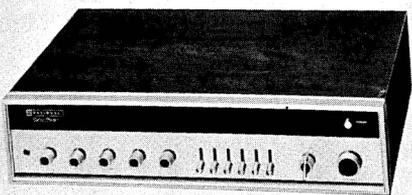
Nikko ST501



Nikko 701-B



National Panasonic SA40



National Panasonic SA54

New range of tuner/amplifiers being introduced shortly. Details of prices and specifications not available at time of going to press.

### ■ KORTING

Distributors: Europa Electronics Ltd, Howard Place, Shelton, Stoke-on-Trent, ST1 4NW. Tel: Stoke-on-Trent 29316.

#### Stereo 400T, Type 30476 ★

Stereo. Natural walnut colour cabinet with satin finish. Ranges: SW, MW, LW, VHF/FM. Tuning indicator. Compensated detector/amplifier. FM sensitivity:  $3\mu\text{V}$ , band width approximately 140kHz. Ferrite aerial for AM. Multiplex decoder with indicator. AFC. 23 transistors, 11 diodes and one rectifier. Output: 8W per channel. Controls: bass, treble, balance and push-button waveband selection. Sockets for aerials, earth, magnetic pickup, tape recorder (and crystal pickup). speakers. Size:  $22 \times 4\frac{1}{2} \times 7\frac{1}{2}$ in. Price: approximately £84 (including PT).

#### Stereo 700, Type 29478

Stereo. Natural walnut, satin finish cabinet. Ranges: SW, MW, LW, VHF/FM. Tuning indicator. Sensitivity: FM  $1.5\mu\text{V}$ , AM  $10\mu\text{V}$ . Ferrite aerial for MW and LW. Multiplex decoder with automatic indicator. AFC. 35 transistors, 15 diodes and one rectifier. Controls: bass, treble, balance, push-button waveband selection. Output: 10W per channel. Sockets for aerials, earth, crystal, ceramic and magnetic pickup, tape recorder, speakers; earphone or headphone. Dimensions:  $6 \times 25 \cdot 9\frac{1}{2}$ in. Price: approximately £130 (including PT).

#### Stereo 1000L, Type 29480 ★

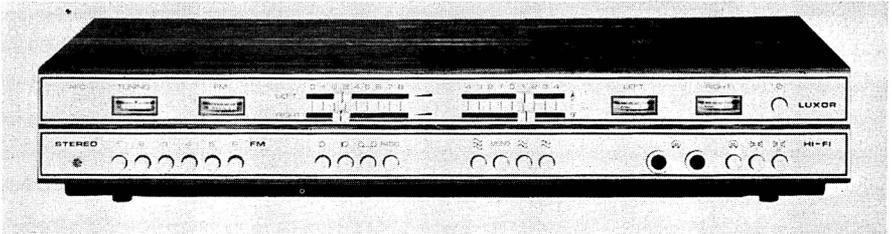
Stereo. Natural walnut cabinet with satin finish. Ranges: SW, MW, LW and VHF/FM. Tuning indicator. Sensitivity: FM  $1.5\mu\text{V}$ , AM  $10\mu\text{V}$ . Ferrite aerial for MW and LW. Multiplex decoder with automatic indicator. AFC. 39 transistors, 16 diodes and two rectifiers. Output: 25W per channel. Controls: treble, bass, balance, push-button wave-change. Sockets for aerials, earth, magnetic, crystal or ceramic pickup; tape recorder, earphone, speakers. Dimensions:  $25 \cdot 6 \times 9\frac{1}{2}$ in. Price: approximately £145 (inc. PT).

### ■ LUXOR

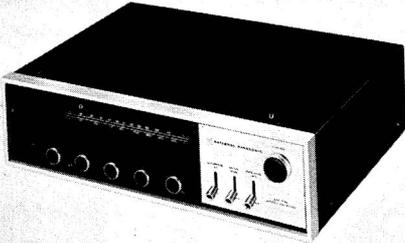
Distributors: Luxitone, 84 Bolsover Street, London, W1. Tel: 01-636 2901.

#### Luxor 4987

Stereo tuner/amplifier. Transistorised. Output: 9W RMS per channel. Output impedance: 4 ohms. HD: 3% at rated output. FR 35Hz-18kHz  $\pm 2\text{dB}$ . Inputs: ceramic PU 250mV 47K, tape 250mV 47K. Range: 87-101MHz. Variable and preset tuning. FM sensitivity:  $4\mu\text{V}$  for limiting. AFC. Multiplex decoder fitted. Size:  $3 \times 18\frac{3}{4} \times 9$ in. Price: £62.50 (including PT).



Luxor 5085



National Panasonic SA420

**Luxor 4988 ★**

Stereo tuner/amplifier. Transistorised. Output: 20W RMS per channel. Output impedance: 4 ohms. HD: 2% at rated output. FR 20Hz-20kHz  $\pm$ 2dB. Inputs: ceramic PU 150mV, magnetic PU 4mV, tape 50mV, mic 1.5mV. FM range: 87-101MHz. Variable and preset tuning. AFC. Multiplex decoder fitted. Size:  $4\frac{1}{2} \times 21\frac{1}{4} \times 10$ in. Price: £99 (including PT).

**Luxor 5085 ★**

Stereo tuner/amplifier. Range: 87-106MHz. Six preset tuning buttons with AFC. Integrated circuit FM discriminator. Meter tuning indicators. Sensitivity: 2 $\mu$ V for 30dB signal-to-noise. Stereo decoder fitted. AFC switchable. Inputs: magnetic PU 4mV 47K, ceramic PU 130mV 1 megohm, tape 65mV 400K, mic 3mV 40K, aux 25mV 100K. Controls: scratch filter 20dB at 20kHz, rumble filter 12dB at 20Hz, bass  $\pm$ 18dB at 50Hz, treble  $\pm$ 16dB at 10kHz, loudness. Output: 30W RMS per channel. HD 0.1% at 6W, 0.5% at 30W. FR 20Hz-20kHz  $\pm$ 1.5dB. Output impedance: 8 ohms. Mains: 240V AC. Slider controls for each channel (volume, bass and treble). Size:  $25\frac{1}{2} \times 4\frac{3}{8} \times 10\frac{7}{8}$ in. Price: £120-61 $\frac{1}{2}$  (plus £28-38 $\frac{1}{2}$  PT).

**■ NATIONAL PANASONIC**

Distributors: Unamec Ltd, PO-Box 1, United Africa House, Blackfriars Road, London, SE1. Tel: 01-928 2070.

**Panasonic SA-40 ★**

Stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-567 metres. Variable tuning.

Meter indicator. Sensitivity: 2.8 $\mu$ V for 20dB quieting. Aerial input: balanced. Stereo decoder fitted. AFC. Inputs: mag PU 3.5mV 50K, mag PU 10mV 100K, ceramic PU 170mV 35K, aux 170mV 35K, tape monitor 170mV 35K. Noise level: -60dB on 3.5mV input, -70dB on other inputs. Controls: volume, bass, treble, balance, filter, input selector. Output: 12W RMS per channel into 8 ohms. AC mains. Size: 16  $\times$  5  $\times$  14in. Price: £120.

**Panasonic SA-54 ★**

Stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-567 metres. Variable tuning. Meter indicator. Sensitivity: 1.8 $\mu$ V for 20dB quieting. Aerial input: balanced. Stereo decoder fitted. AFC. FET front end. Full overload protection. Inputs: mag PU 3mV 50K, ceramic PU, aux 160mV 35K, tape monitor 160mV 35K. Controls: bass, treble, balance, volume, high filter, low filter, input selector. Output: 32W RMS per channel into 8 ohms. AC mains. Size: 20  $\times$  5  $\times$  14in. Price: £154.04.

**Panasonic SA-420 ★**

Stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-567 metres. Variable tuning. Meter indicator. Sensitivity: (FM) 4 $\mu$ V for 20dB quieting, (AM) 100 $\mu$ V/metre. Aerial input: balanced. Stereo decoder fitted. AFC. Inputs: mag PU 2.5mV 50K, ceramic PU 20mV 25K, aux 150mV 65K, tape monitor 150mV 65K. Noise level: mag PU input 60dB, ceramic PU input 60dB, other inputs 70dB. Controls: balance, volume, bass, treble, input selector, stereo/mono, loudness. Output: 11W RMS per channel at 4 ohms. Output impedance: 4/8 ohms. Mains: 110, 120, 220, 240V AC. Size: 16 $\frac{1}{2} \times 5 \times 13$ in. Price: £76-98 (plus £19.02 PT).

**■ NIKKO ELECTRIC MFG CO LTD**

Distributors: Howland-West Ltd, 2 Park End, South Hill Park, London, NW3. Tel: 01-794 6666 and 6033.

**Nikko ST501 ★**

Transistor AM/FM. Range: VHF 88-108MHz, MW 182-565m. Variable tuning. Meter tuning indicator. Sensitivity: 1.8 $\mu$ V for 20dB quieting. Aerial input: 300 ohms balanced. Multiplex de-

★ Indicates entry is illustrated

coder fitted. AFC. Inputs: mag PU 2.8mV 50K, tape head 1.8mV 250K, aux (1) 200mV 250K, aux (2) 500mV 1 megohm. Noise level: PU -60dB, tape -55dB, aux -65dB. Controls: selector, tuning, volume, speaker on/off, mode, tape monitor, loudness, balance, bass (left and right), treble (left and right), mains on/off, local/distance. Output: 18W RMS into 8 ohms. HD 0.8% at rated output. FR 20Hz-20kHz  $\pm$  1dB at full power. Output impedance: 4-16 ohms. Mains: 117-240V 50/60Hz. Size: 15 $\frac{1}{4}$   $\times$  12 $\frac{3}{4}$   $\times$  4 $\frac{3}{4}$ in. Price: £98 (plus £23.89 PT).

#### **Nikko ST701-B ★**

Transistor AM/FM. Range: VHF 88-108MHz, MW 182-565m. Variable tuning. Field effect transistor FM detector. Meter tuning indicator. Sensitivity: 1.8 $\mu$ V for 20dB quieting. Multiplex decoder fitted. Switched AFC. Inputs: PU (mag) 2.8mV 50K, tape head 1.8mV 200K, aux 200mV 250K, aux 500mV 800K. Controls: mode, function, volume, balance, bass (one on each channel), treble (one on each channel), tape monitor, loudness, scratch filter, rumble filter, muting, AFC, speaker on/off, mains on/off. Output: 25W RMS per channel at 8 ohms. HD <0.3% at 20W, <0.8% at 25W. FR 15Hz-50kHz. Noise level: tape -55dB, mono -60dB, aux -65dB. Output impedance: 4-15 ohms. Mains: 117-250V 50/60Hz. Automatic circuit breaker. Size: 15 $\frac{1}{2}$   $\times$  4 $\frac{1}{2}$   $\times$  12 $\frac{3}{4}$ in. Price: £109.50 (plus £26.70 PT).

#### **Nikko STA-301 ★**

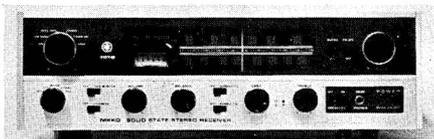
Stereo transistorised tuner/amplifier. Range: 88-108MHz, 187-560m. Variable tuning. Meter tuning indicator. Sensitivity (for 20dB quieting): 2 $\mu$ V. Stereo decoder fitted. Output: 12W per channel, less than 0.8% distortion. FR ( $\pm$  1dB): 20Hz-50kHz. Output impedance: 4-16 ohms. Inputs: gram 2.8mV 50K, noise level -60dB, tape 1.8mV 200K, aux 200mV 330K. Controls: tuning, volume, balance, loudness, function, mono/stereo, bass, treble. Size: 14 $\frac{1}{2}$   $\times$  12 $\frac{3}{4}$   $\times$  4 $\frac{1}{2}$ in. Mains: 110-120/220-240V AC. Price: £80 (plus £19.51 PT).

#### **Nikko STA-1101 ★**

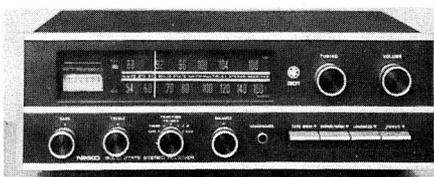
Stereo transistorised tuner amplifier. Range: 88-108MHz and 187-560m. Variable tuning. Meter tuning indicator. Sensitivity (for 20dB quieting): 1.5 $\mu$ V. Stereo decoder fitted. AFC. Output: 37W per channel at 0.3% distortion. FR ( $\pm$  1dB): 10Hz-70kHz. Output impedance: 4-16 ohms. Inputs: gram 2mV 50K, tape 200mV 100K, mic 2 mV 100K. Controls: FM tuning, AM tuning, function, volume, loudness, balance, bass, treble, remote speaker selector, remote speaker volume control. Includes six FETs and twelve ICs. Size: 18 $\frac{1}{2}$   $\times$  14 $\frac{3}{8}$   $\times$  6 $\frac{1}{2}$ in. Mains: 120/220/240V AC. Price: £198 (plus £48.28 PT).



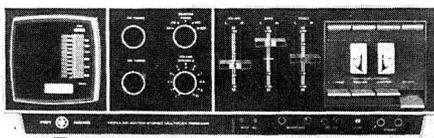
*Nikko ST501*



*Nikko 701-B*



*Nikko STA-301*



*Nikko ST1101*

#### **■ NIVICO**

Denham & Morley Ltd, Denmore House,  
453 Caledonian Road, London, N7.  
Tel: 01-607 6568. Telex: 24562.

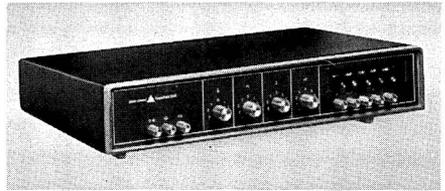
#### **5010U**

AM/FM stereo tuner/amplifier with sound-effect preamplifier. Range: FM 88-108MHz, MW 187-567 metres. Variable tuning. Meter tuning indicator. Sensitivity: (FM) 2.5 $\mu$ V, (AM) 30 $\mu$ V. Inputs: mag PU 2mV, aux 150mV, tape play 150mV. Output: 20W per channel into 4 ohms, 17W per channel into 8 ohms. Output impedance: 4-16 ohms. THD: 1% at 1kHz at rated power. FR: 30Hz-20kHz  $\pm$  1dB. Sound effect amplifier centre frequencies: 60Hz, 250 Hz, 1kHz, 5kHz, 15kHz (all adjustable  $\pm$  12dB). AC mains 100-240V. Size: 16 $\frac{3}{8}$   $\times$  4 $\frac{3}{8}$   $\times$  13in. Weight: 17.2lb. Price: £135.93 (including PT).

#### **5020U**

AM/FM stereo tuner/amplifier with sound-

effect preamplifier. Range: 88-108MHz, MW 187-567 metres. Variable tuning. Meter indicator. Sensitivity: (FM) 2.5µV, (AM) 30µV. Aerial impedance: 300 ohms balanced. Inputs: mag PU 1.5mV, tape play 125mV, aux (2) 125mV. Magnetic equalisation to RIAA. Output: 37.5W per channel into 4 ohms, 30W per channel into 8 ohms. Output impedance: 4-16 ohms. THD: <0.5% at 1kHz at rated output. FR: 20Hz-20kHz ±1dB. Sound-effect amplifier centre frequencies: 60Hz, 250Hz, 1kHz, 5kHz, 15kHz (all adjustable ±12dB). AC mains: 100-240V. Consumption: 125W. Stereo beacon. FET front end. Size: 20 $\frac{3}{4}$  × 5 $\frac{7}{8}$  × 13 $\frac{1}{2}$ in. Weight: 28.6lb. Price: £186.90 (including PT).



Peak Sound 840TA



Philips RH790

## NORDMENDE

Distributors: TAK Continental Importers, 16a High Street, Stone, Staffordshire. Tel: Stone 3232, 3233.

### 5001

Slimline stereo tuner/amplifier. Ranges: VHF, 49m band, MW, LW. Fitted with decoder and beacon. Switchable AFC. Illuminated tuning meter. Output: 6W RMS per channel. Includes mesa transistors. Finishes: walnut, teak, elm or Rio rosewood. Dimensions: 21 × 8 × 4in approx. Price: £93.45 (including PT).

### 5002

Stereo tuner/amplifier only 3in high. Ranges as 5001. Electronic mono/stereo switching with indicator, ICs, ceramic IF filters, panoramic scale. Output: 2 $\frac{1}{2}$ W RMS per channel. Finishes: as 5001. Dimensions: 22 × 8 × 3in approx. Price: £93.45 (including PT). With two LB31, LB32 or LB33 speakers.

### 7001

Bands and stereo facilities similar to 5002. Automatic precision tuning on VHF. Inbuilt aerials. Output: 17W RMS per channel. Finishes: as 5002. Dimensions: 24 × 8 × 5in approx. Price: £103.95 (including PT). With two LB31, LB32 or LB33 speakers.

## PEAK SOUND

Peak Sound (Harrow) Ltd, 32 St Judes Road, Englefield Green, Egham, Surrey. Tel: Egham 5316.

### 840TA ★

Integrated stereo tuner/amplifier. Range: 88-108MHz. Four tunable push-button station selectors. Switchable AFC. Sensitivity: 1µV for 30dB quieting. Stereo sub-carrier rejection: 48dB at 19kHz. S/N: 60dB. FR: 35Hz-30kHz. Aerial input: 75 ohms coaxial and 300 ohms balanced. Tuning meter. Automatic stereo beacon. Incorporates dual-gate FET and IC circuitry, back-to-back variable capacity diodes and ceramic IF filters. Inputs: magnetic PU

2.8mV 47K, microphone 5mV, radio 80mV, tape 80mV. Pickup input overload factor 100mV (32dB). S/N: better than 67dB on PU input, 64dB on other inputs. HD: 0.08% at 1kHz at all powers up to 20W RMS. Output: 20W RMS per channel into 8ohms. Controls: volume, bass ±16dB at 40Hz, treble ±14dB at 10kHz, balance, push-button input selector. Headphone socket and speaker muting switch. Swing-up lid for easy access to connections. Cabinet stands flush against wall. Mains: 110/250V 50/60Hz. Two mains outlets (one switched). Steel case covered with simulated black leather. Size: 16 $\frac{1}{4}$  × 4 $\frac{1}{4}$  × 11in. Price: £95.

## PHILIPS ELECTRICAL LTD

Century House, Shaftesbury Avenue, London, WC2. Tel: 01-437 7777.

### RH790 ★

Solid state stereo AM/FM. Range: 87.5-108MHz, 187-571m, 1,154-2,000m, 16.7-50.4m. Tuning: AM variable; FM variable and pre-set. Ratio FM detector. Tuning indicator: meter. Sensitivity: FM 8µV; AM 100µV. Aerial: 300 ohms balanced. Multiplex decoder with indicator lamp. Switchable AFC. Touch tuning electronically switched presets on FM with varicap tuner unit. Power output: 25W per channel RMS into 8 ohms. HD: <0.3% at 20W per channel. FR: 20Hz-50kHz 3dB below 20W. Noise-level: 80dB below 20W. Provision for 4 ohms at reduced power. Output transistors: four BDY20. Psn 110, 127, 220, 240V. Inputs: magneto/dynamic pickup 4mV, 50K; crystal pickup 70mV, 150K; tape 100mV, 120K. Con-

★ Indicates entry is illustrated

trols: volume, bass +16 to -14dB at 50Hz; treble  $\pm$ 14dB at 10kHz; scratch -12dB/octave -3dB at 4kHz (switchable); low level bass compensation +12dB max at 50Hz (switchable). Dimensions:  $4\frac{3}{8} \times 20\frac{1}{4} \times 10\frac{3}{4}$ in. Price: £139 (inc. PT).

#### RH781 ★

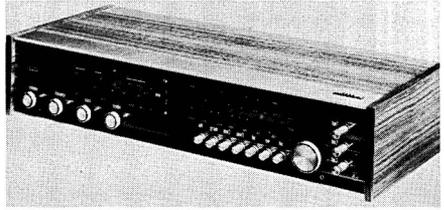
Solid state stereo AM/FM. Range: 87.5-104 MHz, 185-580m, 800-2,000m, 30.6-50.4m. Tuning: AM variable; FM adjustable preset. Ratio FM detector. Tuning indicator: meter. Sensitivity: FM 7 $\mu$ V; AM 70 $\mu$ V. Aerial: 300 ohms balanced. Multiplex decoder, with indicator lamp. AFC. Output: 4-8 ohms; 6.5W per channel RMS into 4 ohms. HD 2% at 4.5W per channel. FR 50Hz-20kHz -3dB. Distortion: 10%. Noise level: 47dB below 6.5W. Output transistors: two AD161/162. Psn 240V. Inputs: crystal pickup 150mV, 300K; tape 70mV, 200K, -47dB noise level. Controls: volume (loudness) +12dB at 80Hz, +6dB at 12kHz; bass +15 to -5dB at 80Hz; treble +9 to -14dB at 12kHz; balance. Dimensions:  $4\frac{3}{8} \times 20\frac{1}{4} \times 8\frac{7}{8}$ in. Price: £74.98 (inc. PT).

#### RH882

Solid state stereo tuner/amplifier fitted with Compact cassette tape deck with recording and playback facilities. Five ranges: 87.5-108MHz, 30.6-50.4m, 185-214m, 213-580m, 800-2,000m. Tuning: variable with 3 presets on VHF. Ratio FM detector. Stereo decoder fitted. Tuning indicator: meter. Sensitivity: (20dB quieting) FM 7 $\mu$ V, AM 70 $\mu$ V. AFC. Aerial: 300 ohms balanced. Power output: 6 $\frac{1}{2}$ W per channel into 4 ohms, 5 $\frac{1}{2}$ W into 8 ohms. HD <2% at 1kHz for 4 $\frac{1}{2}$ W. FR: 50Hz-20kHz into 4 ohms, 35Hz-20kHz into 8 ohms. Noise level: >47dB. Input voltage for stated output power: 130mV at gram/tape input. Controls: tuning, input/waveband selector, volume, balance, bass, treble, on/off. Psn 240W AC. Consumption: 38W. Price: £105 (inc. PT).

#### RH702

Solid state stereo tuner/amplifier. Range: FM 87.5-108MHz, MW 211-577m, 187-214m, LW 882-2,000m, SW 30.7-50.4m. Variable tuning on AM bands, variable tuning plus five preset buttons (electronic tuning) on FM. Meter tuning indicator. Sensitivity: (FM) 6 $\mu$ V for 20dB S/N across 300 ohms, (AM) 80 $\mu$ V for 20dB S/N. Stereo decoder fitted. Stereo beacon. Output: 13W RMS per channel into 4 ohms. HD: <1%. FR: 20Hz-20kHz  $\pm$ 2dB. S/N: -70dB. Inputs: mag PU 1.1mV 50K, mic 0.5mV 2K, tape 220mV 500K. Switched headphone outlet socket. Controls: volume (adjusted for physiology), bass  $\pm$ 15dB at 50Hz, treble  $\pm$ 14dB at 10kHz, balance 0 to 20dB per channel (all controls with thermometer type scales). Finish: teak veneer.



Philips RH781



Pioneer LX440



Pioneer SX770



Pioneer SX990



Pioneer SX2500



Pioneer SX9000

Size:  $22\frac{1}{2} \times 4\frac{1}{2} \times 8\frac{1}{2}$  in. Mains: 110, 127, 220, 240V AC 50/60Hz. Price: £99 (inc. PT).

## ■ PIONEER

Distributors: Shriro (UK) Ltd,  
42 Russell Square, London, WC1.  
Tel: 01-580 6996.

### SX440

AM/FM stereo tuner/amplifier. Range: FM 87-108MHz, MW 187-562 metres. Variable tuning. Meter indicator. Sensitivity:  $2.5\mu\text{V}$  for 20dB quieting. Aerial input: 300 ohms balanced. FET front end. Midnight black front panel with blue light indicators. Inputs: magnetic PU 3mV, tape 130mV, aux 130mV. Noise level: better than 75dB on PU, better than 85dB on other inputs. Controls: bass +13dB -11dB at 50Hz, treble +9.5dB -10dB at 10kHz, loudness +12dB at 50Hz and +6dB at 10kHz. Output: 12W RMS per channel into 8 ohms. HD: <1% at 1kHz. FR: 20Hz-70kHz  $\pm 3\text{dB}$ . Output impedance: 4-16 ohms. Mains: 110, 117, 130, 220, 240V AC. Size:  $16 \times 5\frac{1}{2} \times 15$  in. Price: £91.69 (plus £19.41 PT).

### LX440 ★

AM/FM stereo tuner/amplifier. Range: FM 87.5-108MHz, MW 187-562 metres, LW 860-2000 metres. Variable tuning. Meter indicator. Sensitivity:  $2.5\mu\text{V}$  for 20dB quieting. Aerial input: 300 ohms balanced. Output: 1V. Stereo decoder fitted. AFC. FET front end. Inputs: magnetic PU 3-6mV, tape 200mV, aux 160mV. Noise level: PU better than 75dB, other inputs better than 85dB. Controls: bass +13dB -11dB at 50Hz, treble +9.5dB -10dB at 10kHz, loudness +12dB at 50Hz, +6dB at 10kHz. Power output: 12W RMS per channel into 8 ohms. HD: <1% at rated output. FR: 20Hz-70kHz  $\pm 3\text{dB}$ . Output impedance: 4-16 ohms. Connections and switching for two separate speaker systems. Mains: 110, 117, 130, 220 and 240V AC. Size:  $16 \times 5\frac{1}{2} \times 15$  in. Price: £96.13 (plus £20.37 PT).

### SX770 ★

AM/FM stereo tuner/amplifier. Range: FM 87.5-108MHz, MW 187-562 metres. Variable tuning. Meter indicator. Sensitivity:  $1.8\mu\text{V}$  for 20dB quieting. Aerial input: 300 ohms balanced. Stereo decoder fitted. AFC. FET front end. Two ICs. Inputs: mic, magnetic PU 2.5mV 50K, ceramic PU 58mV 100K, aux 200mV 100K, tape 200mV 100K. Controls: bass +13dB -14dB at 50Hz, treble +10dB -9dB at 10kHz, loudness +12dB at 50Hz, +7.5dB at 10kHz. Output: 20W RMS into 8 ohms. Output impedance: 4-16 ohms. Two speaker outputs for A+B, or A and B. Stereo headphone jack. FM muting control. Mains: 110, 117, 130, 220, 240V AC. Size:  $17 \times 5\frac{3}{4} \times 13\frac{3}{4}$  in. Price: £128.72 (plus £27.30 PT).

### SX990 ★

AM/FM stereo tuner/amplifier. Range: FM 87.5-108MHz, MW 187-562 metres. Variable tuning. Two tuning meters. Sensitivity:  $1.7\mu\text{V}$  for 20dB quieting. Aerial impedance: 300 ohms balanced. Stereodecoder fitted. AFC. FET front end. Four ICs. Four-gang FM tuning section. Preamp and main amplifier may be used separately. Preamp output 1V. Inputs: magnetic PU 3-3mV 50K, ceramic PU 24mV 100K, tape 200mV 100K, aux 200mV 100K. Noise level: magnetic PU better than 80dB, other inputs better than 100dB. Controls: bass +11dB -16.5dB at 50Hz, treble +10dB -9.5dB at 10kHz, loudness +12dB at 50Hz, +9dB at 10kHz, low filter -8dB at 50Hz, high filter -7.5dB at 10kHz. Output: 35W RMS per channel into 8 ohms. HD: <0.5% at 1kHz. FR: 10Hz-100kHz  $\pm 3\text{dB}$ . Output impedance: 4-16 ohms. Output for centre channel speaker system. Mains: 110, 117, 130, 220, 240V AC. Size:  $18\frac{1}{2} \times 5\frac{5}{8} \times 14\frac{1}{2}$  in. Price: £159.35 (plus £33.75 PT).

### SX1500TD

AM/FM stereo tuner/amplifier. Range: FM 87.5-108MHz, MW 187-562 metres. Variable tuning. Two tuning meters. Sensitivity:  $1.7\mu\text{V}$  for 20dB quieting. Aerial input: 300 ohms balanced. Output from tuner section: 1V. Stereo decoder fitted. AFC. FET front end. Four ICs in IF section. Four-gang FM tuning. Inputs: magnetic PU 3-3mV 50K, ceramic PU 24mV 100K, tape 200mV 100K, aux 200mV 100K, mic 3-2mV 30K. Controls: bass +11dB -16dB, treble +10dB -9dB, loudness +12dB at 50Hz, +9dB at 10kHz. Low filter -8dB at 50Hz, high filter 6dB at 10kHz. Output: 58W RMS per channel into 8 ohms. Output impedance: 4-16 ohms. Facilities for mic mixing. Variety of speaker combinations including centre channel connections. Mains: 110, 117, 130, 220, 240V AC. Size:  $18\frac{1}{2} \times 5\frac{3}{4} \times 14\frac{1}{2}$  in. Price: £186.42 (plus £39.45 PT).

### SX2500 ★

AM/FM stereo tuner/amplifier. Range: 87.5-108MHz, MW 187-562 metres. Variable and preset tuning. Two tuning meters. Sensitivity:  $1.6\mu\text{V}$  for 20dB quieting. Aerial input: 300 ohms balanced. Output from preamp: 1V. Stereo decoder fitted. AFC. Automatic tuning on AM and FM, also remote control for auto-tuning. Five ICs. Two crystal filters. Multiplex noise filter. Preset stations on FM stereo and local radio. Inputs: magnetic PU 2.7mV 50K, ceramic PU 60mV 100K, aux (2) 200mV 100K, tape (2) 200mV 100K. Noise level (magnetic PU) better than 80dB; (other inputs) 100dB. Controls: bass +12dB -9dB at 100Hz, treble +9dB -12dB at 10kHz, loudness +13dB at 50Hz, +6dB at 10kHz, low filter: -8dB at 50Hz, high filter

★ Indicates entry is illustrated

-10dB at 10kHz. Output: 84W RMS per channel into 8 ohms. HD: <0.5%. FR: 20Hz-70kHz  $\pm$ 2dB. Output impedance: 4-16 ohms. Mains: 110, 117, 130, 220, 240V AC. Size:  $19\frac{1}{8} \times 5\frac{3}{4} \times 15\frac{1}{8}$ in. Price: £263-23 (plus £55-74 PT).

#### SX9000 ★

AM/FM stereo tuner/amplifier. Range: FM 87.5-108MHz, 187-562 metres. Variable tuning. Two tuning meters. Sensitivity: 1.6 $\mu$ V for 20dB quieting. Aerial input: 300 ohms balanced. Output of preamplifier: 1V. Stereo decoder fitted. AFC. FET front end. Four ICs in IF amplifier section. Inputs: magnetic PU (2) 2.5mV 50K, tape (2) 160mV 50K, aux (2) 160mV 50K, mic (2) 1.6mV 65K. Noise level: PU inputs better than 80dB, other inputs better than 100dB. Controls: bass +12.5dB -14dB at 100Hz, treble +9dB -11dB at 10kHz, loudness +12dB at 50Hz, +7dB at 10kHz, low filter -6dB at 50Hz, high filter -12dB at 10kHz. Reverberation time: 0.2 seconds. Output: 62W RMS into 8 ohms. HD: <0.5%. FR: 10Hz-35kHz  $\pm$ 1dB. Output impedance: 4-16 ohms. Separate reverberation amplifier. Special tone colour selector. Combination of speaker switching. Microphone mixing on mono and stereo. Headphone socket. Mains: 110, 117, 130, 220, 240V AC. Size:  $20\frac{5}{8} \times 7\frac{3}{8} \times 13\frac{5}{8}$ in. Price: £239-06 (plus £50-42 PT).

### ROGERS DEVELOPMENTS

#### (Electronics) LTD

4-14 Barmeston Road, Catford, London, SE6.  
Tel: 01-698 7424/4340.

#### Ravensbrook

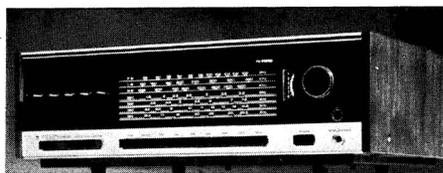
Integrated stereo tuner/amplifier. Range: 88-108MHz. Variable tuning. Ratio detector. Aerial input 75 ohms coaxial and 300 ohms balanced. Stereo decoder fitted. Three-gang FET front end. Integrated circuit (IC) IF amplifier. Inter-station quiet tuning. Output: 10W RMS per channel into 15 ohms, 15W RMS per channel into 8 ohms. HD: <0.1% at rated output. FR: 20Hz-50kHz -3dB. S/N: PU input -53dB. Push-button input selector. Controls: bass, treble, volume, balance, high filter, low filter. Tuning meter. Price: (in cabinet) expected to be about £95.

#### ROTEL

Rank Audio Products,  
PO Box 70, Great West Road, Brentford,  
Middlesex. Tel: 01-568 9222. Telex: 24408.

#### RX200

AM/FM stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-562 metres. Variable tuning. Meter indicator. Sensitivity: 3.5 $\mu$ V. Aerial input: 300 ohms balanced (can be changed to 75



Sansui 600L



Sansui 2000

ohms coaxial). Stereo decoder fitted. Inputs: mag PU 2mV 35K, crystal PU 200mV 150K, tape 250mV 13K, aux 130mV 50K. Noise level: -60dB on PU inputs, -70dB on other inputs. Output: 13W RMS per channel into 4 ohms, 10W RMS per channel into 8 ohms. Controls: bass +12dB -14dB at 50Hz, treble +13dB -12dB at 10kHz, loudness, balance, volume, tape monitor, tuning. HD: 0.2% at rated output. FR: 30Hz-20kHz -1.5dB at 10W. Output impedance: 4, 8, 16 ohms. Mains: 100, 120, 200, 240V 50/60Hz. Size:  $14\frac{1}{4} \times 4 \times 8\frac{1}{4}$ in. Price: £63-19 (plus £15-81 PT).

#### RX400

AM/FM stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-562 metres. Variable tuning. Meter indicator. Sensitivity: (FM) 2.5 $\mu$ V for 20dB quieting, (AM) 30 $\mu$ V. Aerial input: 300 ohms balanced (can be changed to 75 ohms coaxial). Stereo decoder fitted. FET front end. Integrated circuits. A plus B, or A and B speaker switching. Inputs: mag PU 3mV 50K, tape 400mV 15K, aux 200mV 100K. Noise level: PU -60dB, other inputs -70dB. Controls: bass +14dB -12dB at 50Hz, treble  $\pm$ 12dB at 10kHz, loudness, volume, tuning, balance, input selector. Output: 22W RMS per channel into 4 ohms, 20W RMS per channel into 8 ohms. FR: 15Hz-50kHz into 8 ohms. Output impedance: 4, 8, 16 ohms. Mains: 100, 120, 200, 240V 50/60Hz. Size:  $17\frac{1}{8} \times 5 \times 12\frac{1}{2}$ in. Price: to be announced.

#### SANSUI

Vernitron Ltd,  
Thornhill, Southampton, SO9 5QF.  
Tel: Southampton 44811.

**Sansui 200**

AM/FM stereo tuner amplifier. Decoder fitted. Output: 10W per channel into 4 ohms. Push-button controls. Sensitivity: FM 2.3 $\mu$ V. Price: £72.31 (plus £17.68 PT).

**Sansui 300**

AM/FM stereo tuner/amplifier. Stereo decoder fitted. Output: 16W per channel into 4 ohms. HD: < 1% at rated output. Sensitivity: 2.5 $\mu$ V. Pushbutton controls. Price: £84.55 (plus £20.45 PT).

**Sansui 600L ★**

AM/FM stereo tuner/amplifier. Stereo decoder fitted. Output: 25W per channel into 8 ohms. FR: 25Hz-20kHz. Sensitivity: 2 $\mu$ V. Range: FM 88-108MHz, MW 187-572 metres, four SW bands covering 11-19 metres, 19-40 metres, 38-65 metres, 77-166 metres (approximately), LW 770-2000 metres. Slider controls for volume, balance, treble, bass and radio compass. Push-button tuning selectors, pushbutton waveband, and function selectors. Price: £146.93 (plus £35.91 PT).

**Sansui 350 ★**

AM/FM multiplex stereo. Solid state. Range: 88-108MHz, 187-562 metres. Variable tuning with meter indicator. Sensitivity: 2.5 $\mu$ V  $\pm$  3dB (20dB quieting) FM: 25 $\mu$ V  $\pm$  3dB at 1MHz on AM. Inputs: pickup 2.2mV  $\pm$  3dB; aux 150mV  $\pm$  3dB; tape monitor 150mV  $\pm$  3dB; H and

N: pickup 60dB, aux 65dB. Power output: 18W per channel  $\pm$  1dB at 8 ohms. FR 30Hz-20kHz. Distortion: 1%. Dual speaker system. Aerial: 75 and 300 ohms. Controls: tuning, bass, treble, volume, balance, selector, switches for speakers, multiplex noise canceller, loudness, mono mode and tape monitor. Psn 100, 117, 220 and 240V 50 or 60Hz. Size: 4 $\frac{1}{2}$   $\times$  15 $\frac{3}{8}$   $\times$  13 $\frac{1}{8}$  in. Weight: 19.5lb. Price: £111.92 (plus £27.36 PT).

**Sansui 800 ★**

AM/FM multiplex stereo. Solid state with a new FET front end. Range: 88-108MHz, 187-562 metres. Sensitivity: FM 2 $\mu$ V  $\pm$  3dB (20dB quieting); AM 22 $\mu$ V  $\pm$  3dB at 1MHz. Power output: 28W per channel RMS,  $\pm$  1dB at 4 ohms. HD less than 1.0%. Inputs: pickup 2.2mV  $\pm$  3dB; aux, tape monitor (pin and DIN) 150mV  $\pm$  3dB. Damping factor: 60 at 8 ohms. Short-free output terminals for two speaker systems, new type of noise canceller, automatic FM mono/stereo switching with indication. Psn 100, 117, 220 and 240V, 50 or 60Hz. Consumption: 18VA (zero signal) 110VA (max signal). Dimensions of case only: 4 $\frac{1}{2}$  15 $\frac{3}{8}$   $\times$  13 $\frac{1}{8}$  in. Weight: 23lb. Price: £129.04 (plus £31.54 PT).

**Sansui 2000 ★**

AM/FM stereo. Range: VHF 88-108MHz, MW 186-560m. Variable tuning. Ratio detector. Meter tuning indicator. Sensitivity: 1.4 $\mu$ V for 20dB quieting. Aerial input: 75 ohms coaxial.



Sansui 350



Sansui 800

★ Indicates entry is illustrated

Multiplex decoder fitted. AFC. FET front end. Inputs: PU 2.2mV 50K, tape head 2mV 100K, aux 150mV 100K, tape monitor 150mV. Noise level: -70dB on PU, -75dB on other inputs. Controls: speakers A or B, bass/treble cut, bass (each channel), treble (each-channel), loudness, muting, tape monitor, reverse stereo, mono. Output: 32W RMS per channel. FR 15Hz-40kHz  $\pm 1.5$ dB. Output impedance: 4-16 ohms. Mains: 240V 50Hz. Consumption: 150VA. Size:  $16\frac{3}{8} \times 4\frac{7}{8} \times 13\frac{1}{2}$ in. Price: £139.50 (plus £34.1 PT).

#### Sansui 5000A ★

AM/FM multiplex stereo. Solid state with FET and IC circuitry. Range: 88-108MHz, 187-561m. Sensitivity:  $1.4\mu\text{V} \pm 3$ dB (20dB quieting) on FM;  $15\mu\text{V} \pm 3$ dB at 1MHz on AM. Power output: 75W per channel  $\pm 1$ dB at 4 ohms. FR 15Hz-30kHz at 8 ohms. Distortion: less than 0.8%. Will handle three-speaker systems and four tape recorders at same time. Inputs: pickup 2.5mV  $\pm 3$ dB; tape head 2mV  $\pm 3$ dB; aux 150mV  $\pm 3$ dB; tape monitor 200mV  $\pm 3$ dB. H and N (below rated output) volume minimum, better than 80dB. Damping factor: 15 and 50 at 8 ohms. Psn 100, 117, 220 and 240V, 50 or 60Hz. Dimensions:  $4\frac{7}{8} \times 17\frac{1}{4} \times 14\frac{1}{2}$ in. Weight: 29 lb. Price: £182.72 (plus £44.66 PT).

#### Sansui 8

AM/FM stereo tuner/amplifier. Stereo decoder fitted. Output: 60W RMS per channel into 8 ohms. HD: <0.3% at rated output. FR: 5Hz-50kHz. Sensitivity: FM  $1.4\mu\text{V}$ . Range: FM 88-108MHz. Pushbutton controls. Provision for three sets of speakers. Controls: bass, treble, mid-range, balance, volume, input selector, tuning. Sockets for headphones, tape record/play. Balance check pushbutton. High-pass and low-pass filters. FM quiet tuning. Price: £236.58 (plus £57.83 PT).

### ■ SANYO

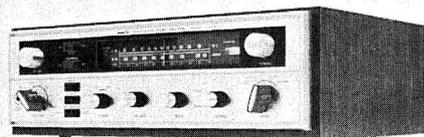
Sanyo Marubeni (UK) Ltd, Sanyo House, Bushey Mill Lane, Watford, Herts.  
Tel: Watford 25354/6.

#### Sanyo DC-60 ★

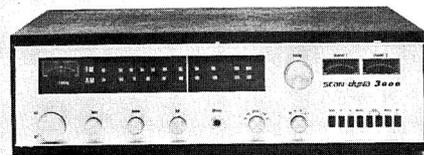
Transistorised stereo integrated tuner/amplifier. Range: 87.5-108MHz, 186-550m. Variable tuning. Ratio detector. Meter tuning indicator. Aerial input 300 ohms balanced. Multiplex decoder fitted. AFC. Inputs: PU (crystal) 400mV 470K, PU (mag) 5mV 50K, tape head 25mV 50K, aux 200mV 100K. Controls: bass  $\pm 8$ dB at 100Hz, treble  $\pm 8$ dB at 10kHz, noise filter -10dB 10kHz, rumble filter -10dB at 50Hz. Output: 30W RMS per channel. HD <1% at rated output. FR 20Hz-20kHz  $\pm 1$ dB. Output impedance: 4-16 ohms. AC mains. Size:  $18 \times 11\frac{1}{2} + 6$ in. Price: £99.95 (including PT).



Sansui 500A



Sanyo DC60



Scan-Dyna 3000

#### Sanyo DC-534

Transistorised stereo integrated tuner/amplifier. Range: VHF 87.5-108MHz, MW 186-550m, variable tuning. Ratio detector. Meter tuning indicator. Aerial input 75 ohms coaxial. Multiplex decoder fitted. AFC. Inputs: PU 5mV 50K, tape head 3mV 50K, tape play 1V 1K. Controls: bass  $\pm 10$ dB at 100Hz, treble  $\pm 10$ dB at 10kHz, noise filter -10dB at 9kHz, rumble filter -10dB at 60Hz. Output: 12W RMS per channel. FR 20Hz-20kHz  $\pm 1$ dB. Output impedance 8 ohms. Includes transcription motor, pickup arm and cartridge. Price: £142.95 (including PT).

### ■ SCAN-DYNA

Distributors: Howland-West Ltd,  
2 Park End, South Hill Park, London, NW3.  
Tel: 01-794 6666 and 6033.

#### Scan-Dyna 3000 ★

Solid state stereo AM/FM tuner/amplifier. Range: 87-108MHz, MW 182-545m. Variable tuning with indicator meter. Sensitivity:  $1.2\mu\text{V}$  mono,  $8\mu\text{V}$  stereo. Aerial impedance: 75 ohms unbalanced, 300 ohms balanced. Multiplex decoder. Power output: 30W into 8 ohms. 50W into 4 ohms. HD 0.2% at 40W. FR 20Hz-20kHz  $\pm 0.5$ dB at 8 ohms. Noise level: 100dB. Inputs:

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**Sharp sets new standards—depend on it!**

Sharp Electronics (UK) Limited, 48 Derby Street, Manchester. M8 8HN.

# Try mixing it with the Sony TC-366... Sony's new 4-track, 2-channel tape deck for stereo/mono recording and playback.

Superb finish on the outside and SONY expertise on the inside — this model is for the enthusiast who knows what he's doing: allows simultaneous mixing from two separate microphone and auxiliary recording controls, and there's a professional three-head system for tape/source monitoring. When

the tape breaks or ends, a mechanical shut off device will automatically stop the tape and return the lever to neutral position.

Model TC-366 — for the man who is something more than an enthusiast.

*Recommended retail price* £110.00

## SPECIFICATION

**System** 4-track stereo/mono recording and playback.

**Power requirements** AC 100, 110, 117, 125, 220 or 240 V, 50 or 60 Hz.

**Power consumption** AC 30 watts.

**Tape speed** 7½ ips (19 cm/s), 3½ ips (9.5 cm/s), 1½ ips (4.8 cm/s).

**Reel capacity** 7 in. (18 cm) or smaller.

**Frequency response** 20–25,000 Hz at 7½ ips; 30–20,000 Hz ±3 dB at 3½ ips; 30–17,000 Hz at 1½ ips;

30–9,000 Hz at 1½ ips.

**Signal-to-noise ratio** Better than 52 dB (normal), 55 dB (SLH).

**Wow and flutter** Less than 0.09% at 7½ ips; less than 0.17% at 3½ ips.

**Harmonic distortion** Less than 1.2% at normal recording level.

**Level indication** Two VU meters.

**Fast forward and rewind time** Within 1 min. 40 sec (1,200 ft. tape).

**Inputs** Microphone input, sensitivity -72 dB (0.19 mV),

impedance 600 ohms, auxiliary input, sensitivity -22 dB (0.06 V),

impedance approx. 100k ohms.

**Outputs** Line output, output level (0.775 V), impedance 100k ohms, headphone impedance 8 ohms.

**Dimensions** 16½ in. (w.) x 8½ in. (h.) x 14½ in. (d).

**Weight** 22 lb. 8 oz.

**Accessories** Empty reel R-7A, connecting cord RK-74 (2), head cleaning ribbon, reel caps, dust protector, non-skid pad (1 set), motor pulley, "SLH" sample tape.

**Recommended optional accessories** Telephone pick-up TP-4S, microphone ECM-21, F98 or equivalent (600 ohms),

stereo headphone DR-4A, DR-5A, microphone mixer MX-6S,

rec/PB connector cable RC-2, magnetic connecting cord RK-66.



**SONY**  
RESEARCH MAKES THE DIFFERENCE  
SONY (U.K.) LTD

Pyrene House,  
Sunbury Cross,  
Sunbury-on-Thames, Middlesex

London Service Centre 5 Dorset Street, London W1

magnetic pickup, 3mV, 47K ohms; crystal pickup, tape and aux, 200mV, 1M ohm each. Controls: on-off volume, function, loudness, high and low filter, bass, treble, balance, speaker on-off or set A and B, monitor, muting, AFC. Psn mains. Price: £120 (plus £27.86 PT).

■ **SHARP**

Sharp Electronics (UK) Ltd,  
48 Derby Street, Manchester, M88HN.  
Tel: 061-832 6115.

**STA31D ★**

Stereo AM/FM tuner amplifier. Range: 88-108 MHz, 186-566m. Variable tuning. Ratio detector on FM. Meter tuning indicator. AFC. Sensitivity:  $1\mu\text{V} \pm 3\text{dB}$ . Aerial input: (FM) 300 ohms balanced. Stereo decoder fitted. Stereo beacon. Inputs: mag PU 2mV, crystal PU 130mV, tape head 1mV, aux 140mV. Controls: bass ( $\pm 10\text{dB}$  at 100Hz), treble ( $\pm 10\text{dB}$  at 10kHz), loudness ( $+10\text{dB}$  at 50Hz,  $+5\text{dB}$  at 10kHz), noise filter, mode, selector, volume, AFC on-off, muting, tuning. Output: 23W RMS per channel. HD: 1% at rated output. FR: 15Hz-40kHz  $\pm 1.5\text{dB}$ . Noise level: 70dB below rated output. Output impedance: 8 ohms and 16 ohms. Mains: 100, 110, 120, 220, 240V 50/60Hz. Size:  $6 \times 18 \times 13\frac{3}{4}$ in. Price: £93.10 (plus £21.90 PT).

**STA32L ★**

Stereo AM/FM tuner/amplifier. Range: 88-108 MHz, 187-566m, 810-2000m. Variable tuning. Ratio detector on FM. Meter tuning indicator. AFC. Sensitivity:  $5\mu\text{V}$ . Aerial input: (FM) 300 ohms balanced. Stereo decoder fitted. Inputs: mag PU 3mV, crystal PU 150mV, tape 200mV, aux 200mV. Controls: volume, balance, bass, treble, tuning, selector. Output: 40W RMS per channel into 4 ohms, 30W RMS per channel into 8 ohms. HD: 0.1% at 5W. FR: 30Hz-50kHz. Noise level: 4mV at minimum volume, 50mV at maximum volume. Output impedance: 4 ohms, 8 ohms, 16 ohms. Size:  $4\frac{7}{8} \times 18\frac{1}{4} \times 14$ in. Price: £117.38 (plus £27.62 PT).

■ **SKANDIA ELECTRONICS**

Distributors: Golding Audio Ltd,  
Marks Tey, Colchester, Essex.  
Tel: Colchester 210433.

**SK120**

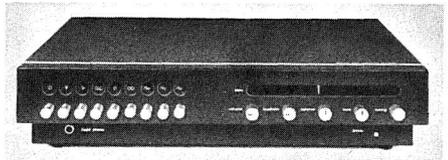
Stereo tuner/amplifier incorporating eight-track cartridge tape recorder. Range: FM 88-108 MHz, MW 187-567 metres. Variable tuning. AFC. Stereo decoder fitted. Controls: volume, tuning, record level (right channel), record level (left channel), balance, AM/FM radio, low filter, high filter, treble, input selector, mono/stereo. Output: 45W RMS per channel. FR: 20Hz-20kHz. Output impedance: 8 ohms. HD



Sharp STA31D



Sharp STA32L



Sonab R7000

<3%. Size:  $29\frac{1}{2} \times 6\frac{1}{8} \times 13\frac{3}{4}$ in. Finish: walnut. Price: £176 (plus £47.19 PT).

See also the Complete System Section.

■ **SONAB LTD**

136 Mansfield Street, Acton, London, W3.  
Tel: 01-993 0849.

**Sonab R7000 ★**

Stereo tuner/amplifier. Range: FM/VHF. Variable tuning. Tuning indicator. Aerial input: coaxial. Stereo decoder fitted. AFC. Transistors. Output: 35W RMS per channel into 8 ohms. HD: 0.02% at 1kHz and 30W into rated load (never more than 0.1% at all levels 25Hz-25kHz). FR: 25Hz-25kHz  $\pm 0.5\text{dB}$ . Size:  $15 \times 3 \times 11$ in. Mains: 240V AC. Price: £229 (including PT).

■ **SONY (UK) LTD**

Pyrene House, Sunbury Cross,  
Sunbury-on-Thames, Middlesex.  
Tel: Sunbury 87644/7. Telex: 266371.

★ Indicates entry is illustrated

### STR-122 ★

Stereo. Ranges: 87-108MHz, 187-566m. Variable tuning. Sensitivity: FM (for 20dB quieting) 5.6µV. Decoder fitted. Switchable AFC. Aerial: 300 ohms balanced. Output: 3W per channel. HD less than 5%. Output impedance: 8 ohms. Inputs: PU 23mV 10K (noise level better than 55dB), tape 100mV 40K (noise level better than 60dB), DIN socket 500mV 80K. Mains: 110, 117, 220, 240V 50/60Hz. Dimensions: 16½ × 12½ × 4¾in. Price: £52.50 (including PT).

### ■ TANDBERG

Distributors: Farnell-Tandberg Ltd, Farnell House, 81 Kirkstall Road, Leeds, LS3 1HR. Tel: Leeds 35111.

#### Hi-Fi FM

Range: 87.5-108MHz. Variable tuning and presets. Sensitivity: 2µV. Decoder optional. AFC. Meter tuning indicator. Output: 15W per channel at 4 ohms. Features: PU and tape inputs. Mains: 220, 240V AC. Dimensions: 16⅞ × 8½ × 5⅝in. Price: £75 (including PT); stereo decoder £9.50 extra (rosewood) £78.

### Solvsuper 1171 ★

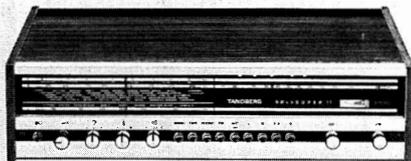
Stereo tuner/amplifier. Range: FM 87.5-108 MHz, MW 188-580 metres, LW 1120-2000 metres, SW 16.3-57 metres. Variable tuning. Meter tuning indicator. Aerial input: 300 ohms balanced and 75 ohms coaxial. Stereo decoder optional extra. AFC. Inputs: magnetic PU 2.5mV 47K, ceramic PU 50mV 1 megohm, tape 250mV 30K. Controls: bass ±13dB at 50Hz, treble +10dB - 14dB at 10kHz, loudness +6dB at 50Hz, +3.5dB at 10kHz. Output: 15W RMS per channel. HD: 0.5% at rated output. FR: 25Hz-25kHz (DIN). Noise level: tape input 54dB, magnetic PU 53dB, ceramic PU 55dB. Output impedance: 4 ohms. Mains: 115-250V 50/60Hz. Size: 17¼ × 4⅝ × 9⅝in. Price: £78.57 (plus £19.43 PT); stereo decoder £9.50 extra.

### ■ TELEFUNKEN

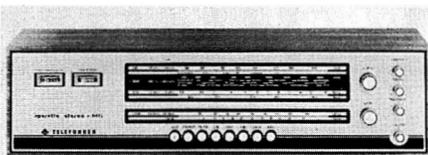
Distributor: A.E.G. (Great Britain) Ltd, A.E.G. House, Chichester Rents, Chancery Lane, London, WC2. Tel: 01-242 9944. Cables: Allgem, London.

### Concertino 201 ★

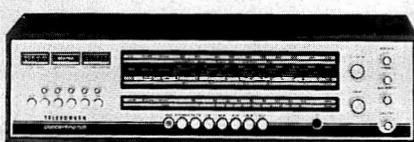
Four waveband transistorised stereo tuner/amplifier with five FM station buttons. Ranges: FM, SW, MW, LW. Separate flywheel FM and AM tuning. AFC with meter. Separate VU meter for station tuning control. Automatic stereo indicator. Sensitivity: FM 1µV for 26dB signal/noise ratio at 40kHz deviation. Output: 15W per channel RMS. HD not greater than 1%. FR (±1.5dB) 20Hz-20kHz. Sockets for 240 ohms FM dipole, local FM dipole (attenu-



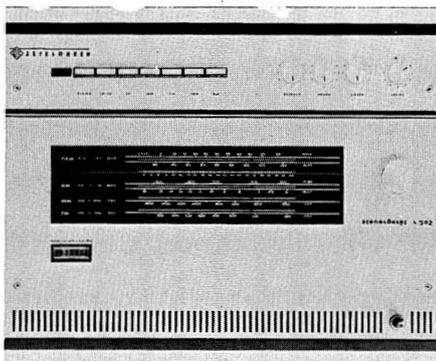
Tandberg Solvsuper 1171



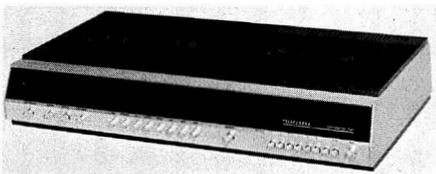
Telefunken Hi-Fi 201



Telefunken Concertino Hi-Fi 201



Telefunken R205



Telefunken Concerto Hi-Fi 101

ator fitted), AM aerial, PU (high impedance), tape recorder (record and playback), two extension speakers. Controls: volume, balance, bass, treble. Pushbuttons: on/off, stereo, PU/tape, wavebands, 5 FM stations, AFC. Mains: 110/127, 220/240V 50Hz. Price: £104.39 (plus £24.24 PT).

### R205 ★

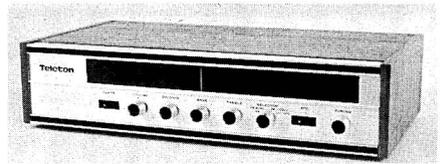
Four waveband radio with stereo amplifier. Ranges: FM, SW, MW, LW. VU meter. AFC. Output: 6W per channel RMS. Output impedance: 4 ohms. Sockets for 240 ohms FM dipole, local FM dipole (attenuator fitted), AM aerial, high-impedance PU, tape recorder (record and playback), two extension speakers. Controls: volume on/off, balance, bass, treble. Pushbuttons for stereo, PU/tape, AFC, four wavebands. Mains: 110/127, 220/240V 50Hz. Price: £72.43 (plus £16.82 PT).

### Operette 201 ★

Four waveband transistorised stereo tuner/amplifier. Ranges: 87.5-104MHz, SW 19.5-1m, 184-582m and 860-2000m. Separate FM and AM tuning. Sensitivity: FM 1.3µV (for 26dB signal/noise ratio at 40kHz deviation), AM 10µV for 50mW output. Stereo decoder fitted. Output: 10W per channel RMS. FR (±1.5dB): 35Hz-20kHz. Output impedance: 4 ohms. Swivel ferrite rod for MW/LW, aux aerial for FM/SW, sockets for 240 ohms FM aerial, sockets with attenuator for FM dipole (local), sockets for AM aerial. Sockets for PU (high impedance), tape recorder (recording and playback) and two extension speakers. Controls: volume, balance, bass, treble. Pushbuttons for wavebands, stereo, PU/tape, on/off. Mains: 110/117, 220/240V 50Hz. Price: £74.99 (plus £17.41 PT).

### Concerto Hi-Fi 101 ★

Five waveband stereo tuner/amplifier. Range: 87.6-104MHz, 910-2000 metres, 186-212 metres, 211-578 metres, 19.5-51 metres. Variable tuning plus seven preset FM stations. Tuning meter. Sensitivity: FM 1µV for 26dB S/N; AM 6µV for 50mW output at 30% modulation, 15µV for 10dB S/N. Stereo decoder fitted. Stereo beacon. Switchable AFC. Inputs: magnetic PU, crystal PU, tape recorder. Controls: seven pushbuttons for preset FM stations, pushbuttons for AFC, wavebands, mono/stereo, input selector, tuning, volume, balance, treble, bass. Output: 30W music power per channel, 22W RMS per channel. HD: better than 1% at rated output. FR: 20Hz-20kHz ±1.5dB. Output impedance: 4 ohms. Socket for stereo phones. 43 transistors, 20 diodes, 4 rectifiers. Mains: 110, 127, 220, 240V 50Hz. Two FETs in FM tuner stage. Variable capacity diode tuning. Price: £119.30 (plus £27.70 PT).



Teleton F2000

### Hi-Fi Compact 2000

FM tuner/amplifier. Range: FM 87.6-104MHz. Variable tuning. Stereo decoder fitted. Inputs: magnetic PU, crystal PU, tape. Controls: treble, bass, balance, volume, pushbutton function selectors. Switchable AFC. Output: 15W RMS per channel, 22W music power per channel. HD: < 1% at rated output. FR: 20Hz-20kHz ±1.5dB. Output impedance: 4 ohms. 43 transistors, 10 diodes, 3 rectifiers. Stereo headphone socket. Mains: 110, 220V 50-60Hz. Consumption: 65W maximum. Sensitivity: 1.3µV for 26dB S/N. Price: to be announced.

### TELETON

Teleton Electro (Distributors) Ltd,  
Teleton House, Robjohns Road, Widford,  
Chelmsford, Essex.  
Tel: Chelmsford 62442. Telex: 99338.

### F.2300

AM/FM stereo solid-state tuner/amplifier. Ranges: 88-108MHz, MW 187-560m. Sensitivity: FM 10µV, AM 150µV/m. IF bandwidth: FM 300kHz, AM 7kHz. Image rejection: FM 45dB, AM 36dB. Signal/noise: AM 30dB. Aerials: FM 300 ohms balanced, AM ferrite rod. Output: 4.5W RMS per channel. FR: 30Hz-15kHz. Signal/noise: 50dB 1kHz. Mains: 220V 50Hz. Dimensions: 16½ × 10 × 4½ in. Price: £55 (including PT).

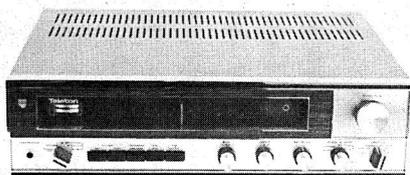
### F.2000 ★

AM/FM stereo solid-state tuner/amplifier with stereo beacon and AFC. Ranges: as F.2300. Sensitivity: FM 15µV (30dB quieting), AM 150µV/m. Multiplex separation: 30dB at 1kHz. Aerials: as F.2300. Output: 7.5W RMS per channel. FR: 40Hz-15kHz. Inputs: gram 200 mV 1 megohm, tape 100mV 0.5 megohm. Signal/noise: 50dB at 1kHz. Outlet: 8 ohms per channel. Mains: 110, 220V 50/60Hz. Price: £51 (including PT).

### R.4200

AM/FM stereo solid-state tuner/amplifier featuring fully automatic FM stereo reception with lamp indication. Ranges: 88-108MHz, 187-555m. Sensitivity: FM 14µV (30dB quieting), AM 180µV/m. Aerials: internal and external 300 ohms balanced. Output: 4W RMS per

★ Indicates entry is illustrated



Teleton 7at1

channel at 8 ohms. Inputs: gram 200mV, aux 200mV. Controls: input selector, tuning, mono/stereo, volume, loudness, AFC, on/off. Mains: 110, 220V 50/60Hz. Dimensions:  $15 \times 10\frac{1}{4} \times 4\frac{1}{4}$ in. Price: £51.75 (including PT).

#### TFS.50

AM/FM stereo solid-state tuner/amplifier. Ranges: 87-108MHz, 187-565m. Sensitivity: FM  $5\mu\text{V}$  (30dB quieting), AM  $200\mu\text{V/m}$  (S/N 20dB). Multiplex separation: 35dB at 1kHz. Image rejection: FM 50dB, AM 60dB. Aerials: ferrite rod and 300 ohms balanced input. Output: 15W RMS per channel at 8 ohms. Controls: six rotary and ten push keys. Mains: 115, 230V AC. Dimensions:  $19\frac{1}{2} \times 12\frac{1}{2} \times 4$ in. Price: £82.50 (including PT).

#### 7 at 1 ★

AM/FM stereo solid-state tuner/amplifier with silicon transistors and featuring: complementary P-P output circuitry giving 25W RMS per channel. FETs for FM front end, auto stereo FM switching with MPX beacon, tuning meter, output to two sets of stereo speakers if required and direct tape monitor switch for recording/playback operations plus programme monitoring. Ranges: 88-108 MHz, 187-565m. Sensitivity: FM  $16\mu\text{V}$ , AM  $100\mu\text{V/m}$ . FR: 20Hz-50kHz. Cross-talk: 46dB at 1kHz. Mains: 115, 230V 50/60Hz. Dimensions:  $16\frac{3}{4} \times 9\frac{1}{2} \times 4\frac{3}{4}$ in. Price: £103.95 (including PT).

#### 7 at 20

AM/FM stereo solid-state tuner/amplifier. Sensitivity:  $10\mu\text{V}$  and  $200\mu\text{V/m}$ . Output: 20W RMS per channel. Dimensions:  $17\frac{3}{4} \times 11 \times 4\frac{1}{4}$ in. Price: £103.95 (including PT).

#### CR 55

AM/FM stereo solid-state tuner/amplifier featuring ICs, FETs and silicon transistors with auto FM mono/stereo switching, auto stereo beacon, in-built FM and AM aerials and outstanding audio section. Output: 25W RMS per channel at 8 ohms. Mains: 110, 220-240V 50Hz. Dimensions:  $22\frac{3}{4} \times 9\frac{3}{4} \times 4$ in. Price: £118.65 (including PT).

#### 10 at 1

Basically similar to 7 at 1 model but with double the output power. Price: £158.55 (including PT).

#### ■ TOSHIBA

Distributors: Hanimex (UK) Ltd, Hanimex House, 15-24 Great Dover Street, London, SE1. Tel: 01-407 8161.

#### SA15

Stereo tuner/amplifier. Range: FM 88-108MHz, 187-555m. FET front end. AFC. Stereo decoder fitted. Automatic switching to stereo on multiplex transmission. Quiet tuning. Controls: mono/stereo, tape monitoring, input selector, speaker switches, balance, bass, treble, volume, loudness, AFC on-off, high-pass filter, low-pass filter, tuning. Outlets: main speakers, auxiliary speakers, headphones, tape. Output: 30W RMS per channel into 8 ohms. HD: 0.1% at 1W, 0.4% at 30W. Two FETs, 49 transistors, 29 diodes. FR: 20Hz-60kHz  $\pm$  3dB. Circuit breaker protects both outputs against overload. Finish: oiled American walnut with black and silver facia. Price: £159 (including PT).

#### SA20

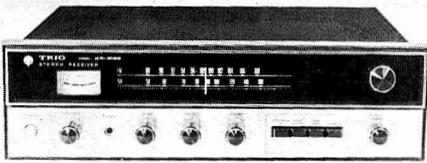
Stereo tuner/amplifier. Range: FM 88-108MHz, 187-555m. FET front end. AFC. Stereo decoder fitted. Automatic switching to stereo on multiplex transmission. Quiet tuning. Controls: mono/stereo, tape monitor, input selector, speaker switches, balance, bass, treble, volume, loudness, quiet tuning on-off, high-pass filter, low-pass filter, AFC on-off, tuning. Outlets: main speakers, auxiliary speakers, headphones. Output: 50W RMS per channel into 8 ohms. HD: 0.1% at 1W and 25W. Two FETs, 55 transistors, 32 diodes. FR: 20Hz-60kHz  $\pm$  3dB. Fully protected output circuits. Finish: oiled American walnut cabinet with black and silver facia. Price: £189 (including PT).

#### ■ TRIO

Distributors: B. H. Morris & Co (Radio) Ltd, 84-88 Nelson Street, Tower Hamlets, London, E1 2DY. Tel: 01-790 4824.

#### KR2120 ★

AM/FM stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-550 metres. Variable tuning. Meter tuning indicator. Sensitivity:  $2.3\mu\text{V}$  (IHF standard). Aerial impedance: 75 ohms coaxial, 300 ohms balanced. Stereo decoder fitted. Inputs: PU (1) 2.5mV 50K, PU (2) 2.5mV 50K, aux/tape 180mV 30K. Noise level: PU inputs -60dB, aux/tape -70dB. Controls: volume, treble, bass, loudness, balance, input selector. Output: 12W RMS per channel. HD: 0.2% at rated output. FR: 25Hz-20kHz (IHF standard). Output impedance: 4-16 ohms. Mains:



Trio KR2120



Trio KR6160



Trio KR4140



Trio KR7070

110-120 and 220-240V 50/60Hz. Size:  $16\frac{3}{4} \times 5\frac{1}{4} \times 12\frac{3}{8}$  in. Circuit incorporates FETs, ICs, step-type tone controls, two sets speaker outlets. Price: £78.09 (plus £15.41 PT).

**KR4140 ★**

AM/FM stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-556 metres. Variable tuning. Meter tuning indicator. Sensitivity:  $1.8\mu\text{V}$  (IH-FM standard). Aerial impedance: 75 ohms coaxial and 300 ohms balanced. Stereo decoder fitted. Inputs: magnetic PU (1) 2.5mV 50K, magnetic PU (2) 2.5mV 50K, aux/tape 150mV 100K, microphone 1.8mV 100K. Noise level: mic input - 58dB, mag PU - 65dB, aux/tape input - 75 dB. Controls: volume, bass, treble, balance, mono/stereo, input selector. Output: 24W per channel RMS. HD: 0.1% at rated output. FR: 18Hz-30kHz (IHFM standard). Output impedance 4-16 ohms. Circuit incorporates FETs, ICs and ceramic filters. Two sets of speaker outlets. Price: £115.48 (plus £23.52 PT).

**KR6160 ★**

AM/FM stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-556 metres. Variable tuning. Two tuning meters. Sensitivity:  $1.6\mu\text{V}$  (IHFM standard). Aerial impedance: 75 ohms coaxial and 300 ohms balanced. Stereo decoder fitted. Inputs: magnetic PU (1) 2.5mV 50K, magnetic PU (2) 2.5mV 50K, aux/tape (1) 180mV 100K, aux/tape (2) 180mV 100K, microphone 1.8mV 100K. Noise level: magnetic PU and mic inputs - 65dB, other inputs - 75dB. Controls: volume, bass, middle, treble, balance, input selector. Output: 70W RMS per channel. HD: 0.1% at rated output. FR: 12Hz-30kHz. Output impe-

dance: 4-16 ohms. Circuit incorporates FETs, ICs, low and high filters and middle-range tone control. Step-type controls. Wood sleeve fitted. Mains: 110-120V and 220-240V 50/60Hz. Size:  $16\frac{3}{4} \times 5\frac{1}{4} \times 12\frac{3}{8}$  in. Price: £163.07 (plus £31.93 PT).

**KR7070 ★**

AM/FM stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-556 metres. Variable and automatic tuning. Meter tuning indicator. Sensitivity:  $1.5\mu\text{V}$  (IHFM standard). Aerial impedance: 75 ohms coaxial and 300 ohms balanced. Stereo decoder fitted. Inputs: magnetic PU (1) 0.05mV 200 ohms, magnetic PU (2) 2.5mV 50K, microphone 2.5mV 100K, aux/tape play 200mV 100K. Noise level: PU (1) - 45dB, PU (2) - 65 dB, mic - 67dB, aux/tape - 75dB. Controls: volume, bass, treble, balance, mono/stereo, input selector, filters, loudness, presence. Output: 90W RMS per channel. HD: <0.05% at rated output. FR: 10Hz-30kHz (IHFM standard). Output impedance: 4-16 ohms. Automatic and remote station tuning. Tape dubbing facilities. Full range of filters. Mains: 110-120V and 220-240V 50/60Hz. Size:  $17 \times 6\frac{1}{2} \times 15$  in. Price: £269 (plus £51 PT).

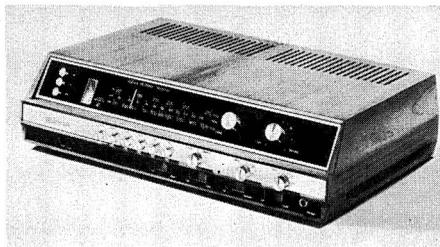
**■ WHARFEDALE**

Rank Wharfedale Ltd, Bradford Road, Idle, Bradford, Yorkshire. Tel: Bradford 612552.

**Wharfedale 100.1 ★**

Stereo tuner/amplifier. Range: FM 87.5-108 MHz, 182-585m, 1090-2000m. Variable tuning. Meter tuning indicator. Stereo beacon. Sensitivity: FM  $1.0\mu\text{V}$  for 30dB quieting, AM  $25\mu\text{V}$

★ Indicates entry is illustrated



Wharfedale 100.1

for 20dB S/N. Multiplex decoder fitted. Inputs: tape and aux 100mV 50K, mag PU 3.5mV, ceramic PU 20mV 33K. Controls: pushbutton waveband selectors, tuning, volume on-off, treble, bass, balance, pushbutton selectors for stereo, mono, aux input, radio input, PU input, tape input, rocker switches for quiet tuning on-off, low pass filter on-off, remotespeakers on-off, local speakers on-off. Output: 35W RMS into 8 ohms, 35W RMS into 4 ohms, 25W RMS into 15 ohms. HD: <0.07% into 8 ohms, <0.14% into 4 ohms, <0.05% into 15 ohms, all powers up to maximum rated output. FR: 12.5Hz-50kHz  $\pm$  3dB. Built-in ferrite rod aerial for AM, also aerial socket. FM tuner stereo crosstalk better than 35dB at 1kHz. Low pass filter: -6dB at 7kHz. Headphone socket. Wood veneer cabinet. Sloping dial with fibre optics pointer illumination. Mains: 110, 117, 127, 220-240V, 50-60Hz. Size:  $4\frac{3}{8} \times 17\frac{5}{8} \times 12\frac{3}{8}$ in. Weight: 20 $\frac{1}{2}$ lb. Price: £119.20 (plus £29.80 PT).

## ■ YAMAHA

Distributors: Jonathan Fallowfield Ltd,  
56-60 St John Street, London, EC1.  
Tel: 01-253 7591.

### AA70

AM/FM stereo tuner/amplifier. Range: FM/VHF, MW 230-555 metres. Variable tuning. Meter tuning indicator. Sensitivity: FM 2.5 $\mu$ V, AM 20 $\mu$ V (IHRM standard). Aerial input: (FM) 300 ohms balanced, ferrite rod for AM. Stereo decoder fitted. Inputs: magnetic PU 3.0mV 50K, aux 170mV 100K, tape play 200mV 100K. Noise level: PU input -65dB, aux -75dB. Controls: bass  $\pm$ 13dB at 50Hz, treble  $\pm$ 13dB at 10kHz. Output: 30W RMS per channel into 8 ohms, 35W RMS per channel into 4 ohms. HD: 0.3% at 1kHz at rated output. FR: 30Hz-20kHz  $\pm$ 1dB. Main and remote speaker systems. Headphone outlet jack. Stereo beacon. Indicator lights to show function. AC mains. Size:  $18\frac{1}{2} \times 5\frac{1}{2} \times 17\frac{1}{2}$ in. Circuit comprises 34 transistors, 25 diodes. Price: £140 (inc. PT).

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of hi-fi stereo  
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No field is changing, developing, or expanding faster than hi-fi stereo.

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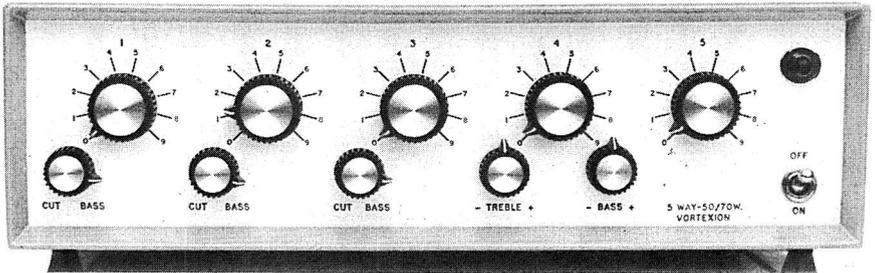
**LOUIS & LEWIS (ELECTRONICS) LTD**

154-155(H) HIGH STREET, BRENTFORD, MIDDLESEX

01-560 1161

# Vortexion

**50/70 WATT ALL SILICON AMPLIFIER WITH BUILT-IN 5 WAY MIXER USING F.E.T.s.**



This is a high fidelity amplifier (0.3% intermodulation distortion) using the circuit of our 100% reliable—100 Watt Amplifier with its elaborate protection against short and overload, etc. To this is allied our latest development of F.E.T. Mixer amplifier, again fully protected against overload and completely free from radio breakthrough. This is similar to the 4 way version but with 5 inputs with bass cut controls on each of the three low impedance balanced line microphone stages, and a high impedance (10 meg) gram stage with bass and treble controls, plus the usual line or tape input. All the input stages are protected against overload by back to back low noise, low intermodulation distortion and freedom from radio breakthrough. A voltage stabilised supply is used for the pre-amplifiers making it independent of mains supply fluctuations and another stabilised supply for the driver stages is arranged to cut off when the output is overloaded or over temperature. The output is 75%, efficient and 100V balanced line or 8-16Ω output are selected by means of a rear panel switch which has a locking plate indicating the output impedance selected.

**100 WATT ALL SILICON AMPLIFIER.** A high quality amplifier with 8 ohms—15 ohms or 100 volt line output for A.C. Mains. Protection is given for short and open circuit output over driving and over temperature. Input 0.4 V on 100K ohms.

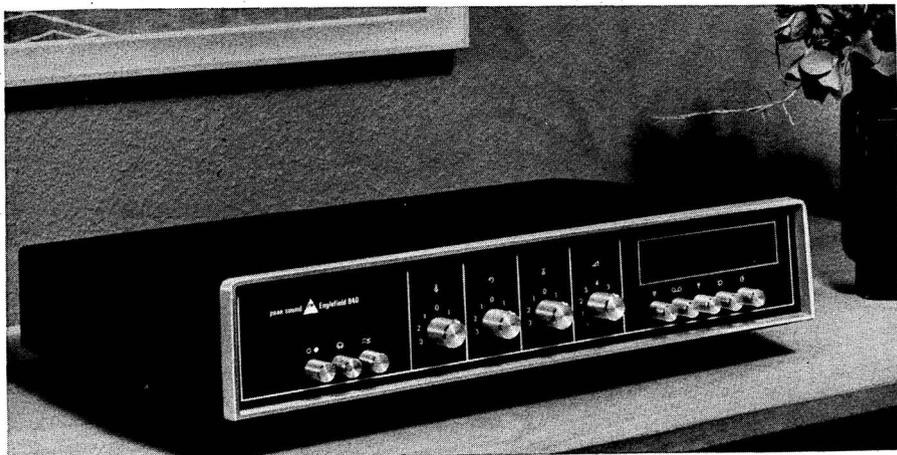
**THE 100 WATT MIXER AMPLIFIER** with specification as above is here combined with a 4 channel F.E.T. mixer, 2-30/60 Ω balanced microphone inputs, 1-HiZ gram input and 1-auxiliary input with tone controls and mounted in a standard robust stove enamelled steel case. A stabilised voltage supply feeds the tone controls and pre amps, compensating for a mains voltage drop of over 25%, and the output transistor biasing compensates for a wide range of voltage and temperature. Also available in rack panel form.

**200 WATT AMPLIFIER.** Can deliver its full audio power at any frequency in the range of 30 c/s—20 Kc/s ± 1 dB. Less than 0.2% distortion at 1 Kc/s. Can be used to drive mechanical devices for which power is over 120 watt on continuous sine wave. Input 1 mW 600 ohms. Output 100—120 V or 200—240 V. Additional matching transformers for other impedances are available.

**VORTEXION LIMITED, 257-263 The Broadway, Wimbledon, SW19 1SF**

Telephone: 01-542 2814 and 01-542 6242/3/4 Telegrams: "Vortexion London S.W.19"

# from peak sound



## a genuinely new concept in high-fidelity design

Better looking—*obviously* . . . Better performing, *definitely* . . . and certainly lower priced compared with other top line high fidelity equipment. Yet with all this, the new Englefield 840 has still further plus features. **Only with the 840 system can you incorporate the tuner within the amplifier itself**, enabling you to convert the Englefield to a Stereo F.M. tuner & amplifier of unsurpassed performance in a matter of minutes. The Englefield Add-in 'Press-tune' Stereo F.M. Link can also be used with other amplifiers if so desired. See and hear the new Englefield 840 range at your hi-fi stockist NOW or send for full details by return. *Englefield equipment is also available in modular form for the home constructor.* Englefield 840 equipment is guaranteed for 5 years.

### peak sound Englefield 840

The Englefield 840 amplifier, built, is available with black, blue, red or green simulated soft leather cover over the unique swing-up lid which reveals the interior instantly and keeps external connections conveniently concealed.  
*Recommended retail price £49.50*



PEAK SOUND (HARROW) LTD., 32 ST. JUDES ROAD,  
ENGLEFIELD GREEN, EGHAM, SURREY. Tel. Egham 5316

# Directory of Amplifiers and Control Units

★ Indicates entry is illustrated.

Abbreviations used in this section are given on page 46

## ■ ACOUSTIC RESEARCH

Distributors: Bell & Howell Ltd, Audio Products Division, Alperton House, Bridgewater Road, Alperton, Middlesex, HAO 1EG. Tel: 01-902 8812. Telex: 261378.

### AR Universal Amplifier

Integrated stereo amplifier. Inputs: magnetic PU 2-5mV (adjustable) 50K, tape 200mV 150K, aux 200mV 150K. Noise level: PU input 57dB, other inputs 75dB. Controls: bass, treble, balance, volume, input selector, mono/stereo mode. Output: 60W RMS per channel. HD: <0.5%. FR: 20Hz-20kHz  $\pm$  1dB. Output impedance: 4-16 ohms. Mains: 100, 120, 220, 240V 50/60Hz. Size: 15 $\frac{1}{2}$   $\times$  4 $\frac{1}{2}$   $\times$  10in. Price: £174.

■ ACOUSTICAL See Quad.

## ■ ALBA (RADIO & TELEVISION) LTD

Tabernacle Street, London, EC2.  
Tel: 01-253 1322.

### UA700

Integrated stereo amplifier. Inputs: mic 2-3mV 50K, aux (1) 2V 3 megohms, aux (2) 375mV at 500K, radio 100mV 150K, magnetic PU 5mV 50K, ceramic PU 60mV. Controls: volume, bass  $\pm$  15dB at 60Hz, treble  $\pm$  15dB at 14kHz, loudness, balance, input selector push-buttons. Output: 15W per channel (20W per channel IHF rating). HD: <0.1% up to rated output. FR: 30Hz-18kHz  $\pm$  1dB. Noise level: (magnetic PU) -55dB, (aux and radio) -63dB. Crosstalk: better than -38dB. Output impedance: 8-15 ohms. AC mains 240V 50/60Hz. Size: 16 $\frac{1}{2}$   $\times$  4  $\times$  7 $\frac{1}{2}$ in. Finish: teak end pieces, black leathercloth top and brushed aluminium front panel. Price: £34.50.

## ■ ALPHA

Highgate Acoustics Ltd,  
184-188 Great Portland Street, London, W1.  
Tel: 01-636 2901.

### F212 ★

Integrated stereo transistor amplifier. Inputs:

magnetic PU 5mV 50K, ceramic PU 50mV 1 megohm, tape recorder 150mV 350K, aux 500mV 1 megohm. Tone controls: bass  $\pm$  12dB, treble  $\pm$  12dB. Output: 12W RMS per channel. HD: <0.1% at 8W output, <0.5% at 10W. FR: 20Hz-20kHz. Output impedance: 8 ohms. Outputs for four speakers. AC mains. Size: 10 $\frac{1}{2}$   $\times$  3 $\frac{1}{8}$   $\times$  7 $\frac{3}{4}$ in. Price: £36.75.

## ■ AMSTRAD

Amstrad Electronics Ltd,  
34-35 Great Sutton Street, London, EC1.  
Tel: 01-251 0241/2.

### Stereo 8000 ★

Integrated stereo amplifier. Output: 7W RMS per channel. Inputs: magnetic PU 4mV 47K, ceramic PU 100mV 1.5M, crystal PU 350mV 47K, radio 100mV 750K, tape 100mV 750K. Tape outlet socket: 100mV 750K. Controls: volume on-off, balance, treble, bass, mono/stereo, input selector. HD: 1% at 6W output. FR: 35Hz-20kHz  $\pm$  3dB. Noise level: -52dB at 6W, input open-circuit. Output impedance: 8 ohms. Mains: 240V AC. Size: 16 $\frac{1}{2}$   $\times$  3  $\times$  7in. Price: £25.95.

## ■ A/R/D

Audio Research and Development Ltd,  
PO Box 73, Hounslow, Middlesex.  
Tel: 01-570 0471.

### 2000 ★

Solid state stereo amplifier. Power output: 10W RMS into 15 ohms. HD: 0.4% at 10W RMS. FR: 20Hz-20kHz  $\pm$  0.5dB. Controls: bass  $\pm$  12dB at 50Hz; treble  $\pm$  12dB at 10kHz; volume, balance. Pushbuttons for on/off, radio tape record. Inputs: PU sockets with DIN duplicates for tape and radio: tape record, tape play, radio tuner, ceramic pickup, magnetic pickup, with RIAA equalisation. Psn: 190/255V 50Hz or 110-120V 60Hz. Dimensions: 7  $\times$  4 $\frac{1}{4}$   $\times$  12in. Price: (grey case) £49; (teak veneered case) £52.50.

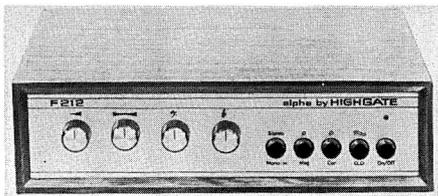
## ■ ARMSTRONG AUDIO LTD

Walters Road, London, N7. Tel: 01-607 3213.

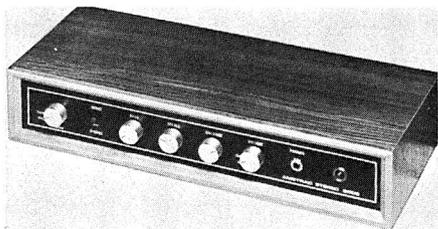
### Model 521 ★

Integrated stereo transistor amplifier. Inputs: PU(1) 60mV 100K, PU(2) 3-5mV 50K, radio 100mV 100K, tape play 400mV 100K. Noise level: PU -55dB, radio -60dB, tape -70dB. Controls: balance (maximum to zero each channel), bass  $\pm$  10dB, treble  $\pm$  10dB, loudness (two different volume levels with loudness contours at low level), rumble filter -5dB at 30Hz, treble filter (1) 6-5kHz -3dB, 10kHz -25dB; treble filter (2) 4-5kHz -3dB, 9kHz -40dB. Output: 25W RMS per channel. Output impedance:

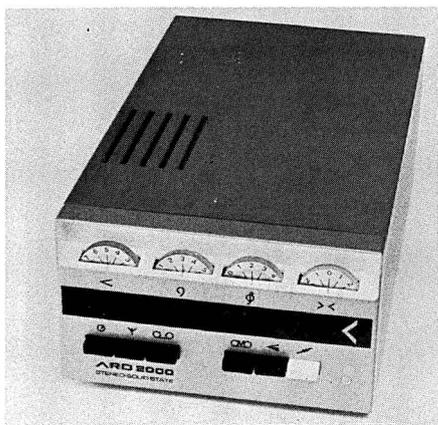
★ Indicates entry is illustrated



Alpha F212



Amstrad Stereo 8000



ARD 2000

4-16 ohms. Output transistors: AL102. FR 20Hz-20kHz -1dB at 25W RMS. Mains: 100-125V and 200-250V AC. Size: 11½in wide, 10¼in deep, 4¾in high. Price: £56.

### ■ ASTRONIC

Associated Electronic Engineers Ltd, Dalston Gardens, Stanmore, Middlesex, HA71BL. Tel: 01-204 2125.

#### Series 1700

Modular amplifying equipment, enables a special system to be built up from standard units.

#### Type 1701

Basic 10W amplifier with 8 ohms output. Source

impedance: 1 ohm. Inputs: impedance 1,000 ohms; sensitivity: 0.5V. FR: 40Hz-40kHz +1 dB, 40Hz-12kHz +2dB. Noise: -75dB. Distortion: 1%. Psn: 200-250V 40-60Hz, 30VA. Dimensions: 5×7×6½in. Weight: 7lb. Input connections by single coax plug/socket. Output connection by terminal block. Various types of pre-amplifier modules available. Full details on request.

### ■ BANG & OLUFSEN UK LTD

Eastbrook Road, Gloucester, GL47DE. Tel: Gloucester 21591.

#### Beolab 5000 ★

Integrated stereo amplifier. 60W per channel, 4 ohms. HD 0.2% at 1kHz, 0.6% at 20Hz-20kHz 60W. FR 20Hz-20kHz ±1.5dB. Noise 90dB below 60W with volume control at minimum. Four 2N3055 output transistors. Inputs: mic 150µV 200 ohms, gram 200mV 1 Meg, gram 1.3mV 47K, tuner 200mV 470K, tuner 6mV 47K, Aux 200mV 470K, tape 200mV 470K. Controls: bass, treble, balance, volume, mic, gram, tuner, aux, tape, mono, low filter, hi filter, loudness, speakers, test buttons, on/off. Mains consumption: 4W-325W. Size: 18½×4×9¾in. Teak or rosewood. Price (teak): £149.75; (rosewood) £150.75.

#### Beolab 6006 Spread Unit ★

Provides connection for a centre speaker from Beolab amplifier. Connects between amplifier and speaker. Single control to vary width of stereo effect. Can also be used as headphone output from Beolab amplifier. Price: £8.50.

### ■ BRADMATIC LTD

338 Aldridge Road, Streetly, Sutton Coldfield, Warwickshire. Tel: 021-353 3171.

#### Power Amplifiers

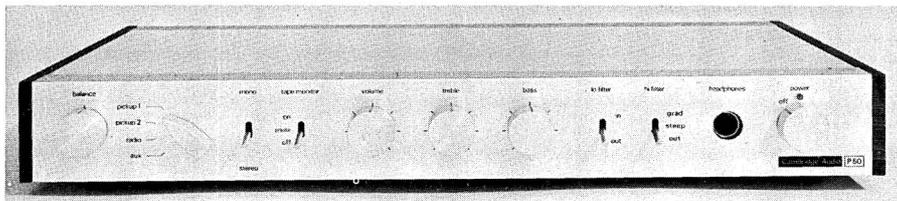
Solid-state power amplifiers SSP2 (100W) and SSP1 (50W). Control units, reverberation units, manufactured to order. Quotations given. Full details on request.

### ■ BRYAN AMPLIFIERS LTD

18 Greenacres Road, Oldham, Lancs. Tel: 061-624 4074.

#### 9000/50

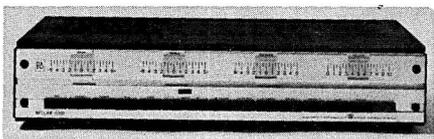
Integrated stereo amplifier and control unit. Output: 25W per channel into 15 ohms. HD: better than 0.1%. FR: 35Hz-33kHz ±1dB at 1W. Feedback -60dB. Output impedance 4-15 ohms. Inputs: magnetic pickup, 3mV, 50K, noise level -70dB; ceramic pickup, 40mV, 100K, noise level -60dB; radio, tape and aux, 75mV, 50K, noise level -60 to -70dB. Controls: volume and on-off; balance; bass; treble; selector; mode; monitor; rumble filter. Mains



Cambridge Audio P50



Armstrong Audio 521



Bang & Olufsen Beolab 5000



Bang & Olufsen Beolab 6006

powered. Dimensions:  $13\frac{3}{4} \times 5\frac{1}{4} \times 10\frac{3}{8}$ in. Price: (chassis) £57, (in wood cabinet) £62-70.

A new Bryan amplifier is expected to be available, in addition to the 9000/50, in time for the Audio Fair in October 1971. Details were not available as this edition of the Year Book went to press.

■ BUSH NELSON LTD

Bush House, 6 Yattendon Road, Horley, Surrey. Tel: Horley 5983.

Integrated transistor stereo amplifier

Controls: on/off, mono/stereo, volume, balance, bass, treble. Output: 35W music (total). FR: 15Hz-30kHz  $\pm 1$ dB at 1W. Size:  $12 \times 6 \times 2$ in. Price: £31.

■ CAMBRIDGE AUDIO

Cambridge Audio Laboratories Ltd, The River Mill, St Ives, Huntingdon, PE174EP. Tel: St Ives (Hunts) 2901. Telex: 32223.

P50 ★

Stereo integrated amplifier. Output: 25W per channel into 8 ohms, 15W into 15 ohms (both at 1kHz). FR: 25Hz-25kHz  $\pm 0.5$ dB. HD:  $< 0.05\%$  at all levels up to rated output. Intermodulation distortion:  $< 0.1\%$  at all levels up to rated output. S/N:  $> 60$ dB on pickup input,  $> 70$ dB on tuner input (both figures unweighted and unaffected by volume setting). Inputs: PU 3mV 47K, PU 100mV 100K (both RIAA equalised), radio 25mV 180K flat, aux 150mV 100K flat. Tape monitor: 500mV. Tape output: 250mV. Crosstalk: better than 50dB at 1kHz. Size:  $16\frac{1}{2} \times 9\frac{3}{8} \times 2$ in. Price: £88.

P100

Similar specification to the P50 amplifier but power output 50W per channel into 8 ohms, 36W per channel into 15 ohms. Also PU 2 3mV 47K. Price: £145.

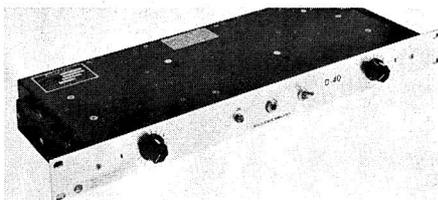
■ CROWN INTERNATIONAL

Distributors: Carston Electronics Ltd, 71 Oakley Road, Chinnor, Oxon. Tel: 0844 52061. London office: Shirley House, 27 Camden Road, London, NW1. Tel: 01-267 2748.

★ Indicates entry is illustrated

#### D-40 ★

Stereo power amplifier. Output: 45W RMS into 4 ohms, 30W into 8 ohms, 20W into 16 ohms (per channel); 80W RMS into 8 ohms (mono). HD <0.5% at rated output. FR: 5Hz-50kHz  $\pm$  1dB at rated output. Damping factor > 200. H and N 100dB below 30W. Input 0.6V for full output. Psn: 117-240V, 50/60/400Hz. Size: 19  $\times$  1 $\frac{3}{4}$   $\times$  7 $\frac{3}{8}$ in. Weight: 8 $\frac{1}{2}$ lb. Fully protected against short circuit or mismatch. Headphone monitor socket. Price: £120.



Crown International D-40

#### DC-300 ★

Stereo power amplifier. Output: 340W RMS into 4 ohms, 190W RMS into 8 ohms. FR: 0-30 kHz. HD: <0.2%. H and N >100dB below 150W. Size: 19  $\times$  7  $\times$  9 $\frac{3}{4}$ in. Price: £350.



Crown International DC300

#### IC-150

Stereo preamplifier and tone control unit incorporating IC circuitry. Comprehensive specification. Full details on request. Price: £140.

### ■ CROWN RADIO CO LTD

128-129 Shoreditch High Street,  
London, E1 6JE. Tel: 01-739 2382.

#### SHC-51 ★

Integrated stereo amplifier, with cassette tape recorder. Output: 15W RMS per channel into 8 ohms. FR: 30Hz-20kHz. Controls: volume, balance, bass, treble. VU meters and digital tape counter included. Two dynamic microphones and cassette tape provided. Pushbutton operation of tape unit. Headphone jack and speaker button. Dimensions: 4 $\frac{1}{8}$   $\times$  15 $\frac{1}{8}$   $\times$  10 $\frac{1}{2}$ in. Weight: 14 $\frac{1}{2}$ lb. Price: £81.46 (plus £20.12 PT).



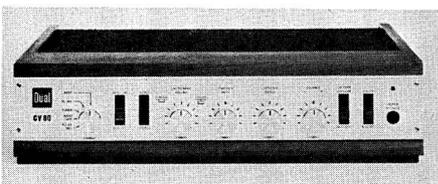
Crown Radio SHC-51

### ■ DUAL ELECTRONICS LTD

St Georgen House, Mill Road, Stokenchurch,  
High Wycombe, Bucks. Tel: Radnage 3467/8.

#### CV80 ★

Integrated stereo amplifier. Output: 32W RMS per channel into 4 ohms. FR: 10Hz-80kHz  $\pm$  1.5dB. HD: <0.2% at 1kHz at 25W output. Inputs: high impedance mic, magnetic PU, crystal PU, radio, tape, tape monitor (through power amplifier only). Fully electronically protected. Speaker muting switch and headphone socket fitted. Mains: 110, 125, 220, 240V AC. Price: to be announced.



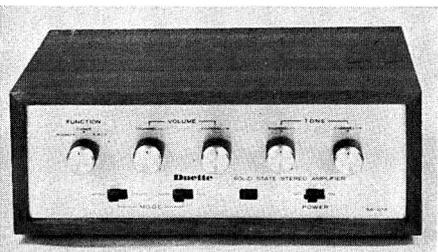
Dual CV80

### ■ DUETTE

Distributors: J. J. Silber Ltd,  
11 Northburgh Street, London, EC1.  
Tel: 01-253 8031.

#### SA616 ★

Stereo transistor amplifier. Output: 6W RMS per channel. HD: <0.1% at rated output. FR: 30Hz-20kHz  $\pm$  1dB. Noise level: -55dB. Inputs: pickup 100mV, radio 100mV, aux 100mV. Output impedance: 4, 8, 16 ohms. Mains: 240V AC. Size: 4 $\frac{1}{4}$   $\times$  11  $\times$  8 $\frac{1}{4}$ in. Price: £19.95.



Duette SA616

**SA400 ★**

Stereo transistor amplifier. Output: 6W RMS per channel. FR: 30Hz-20kHz  $\pm 1.5$ dB. Noise level: better than 60dB. Inputs: mag PU 3mV, radio 150mV, crystal PU 150mV. Output impedance: 4, 8, 16 ohms. Mains: 240V AC. Size:  $4 \times 13\frac{1}{2} \times 10\frac{1}{2}$ in. Price: £32.97.

**SA500 ★**

Stereo transistor amplifier. Output: 10W RMS per channel. FR: 20Hz-20kHz  $\pm 1$ dB. HD:  $< 1\%$  at rated output. Noise level: better than 60dB. Inputs: mag PU 3mV, ceramic PU 30mV, radio 150mV. Output impedance: 4, 8, 16 ohms. Tape outlet. Mains: 240V AC. Size:  $4\frac{1}{4} \times 13\frac{1}{2} \times 10\frac{1}{2}$ in. Price: £39.96.

**■ DYNACO**

Distributors: Howland-West Ltd,  
2 Park End, South Hill Park, London, NW3.  
Tel: 01-794 6666.

**PAT.4 ★**

Transistorised stereo control unit. Inputs: PU (low level). PU (high level), tape head, tape amplifier, radio, aux (high level), aux (high level) to socket on front panel. Noise level: -70 dB on low level inputs, -85dB on high level inputs. Controls: selector, volume, balance, bass (left and right), treble (left and right), filter, loudness, tape monitor, bass filter, mode, on/off. Mains: 120-240V 50-60Hz. Designed for use with Dynaco Stereo 120 or other similar high quality amplifiers. Size:  $13\frac{1}{2} \times 4\frac{1}{4} \times 9$ in. Price: (assembled) £69; (kit) £56.

**Stereo 120 ★**

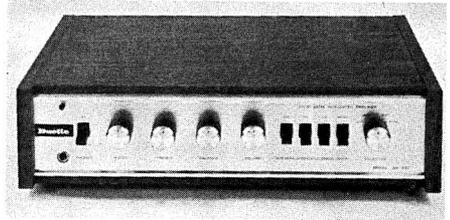
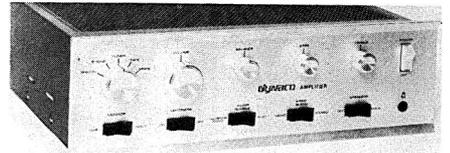
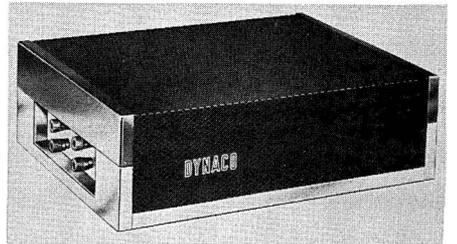
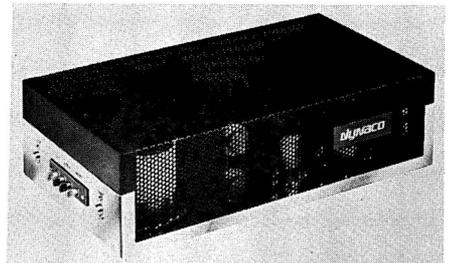
Transistor stereo power amplifier. Output: 35W RMS per channel. HD less than 0.25% up to 60W 20Hz-20kHz. FR 5Hz-100kHz  $\pm 0.5$ dB. Noise: 95dB below stated output (unweighted). Input: 1.5V for stated output. Output impedance: 4-16 ohms. Output transistors: selected RCA 2N3055. Mains: 220-240V AC. Size:  $13 \times 10\frac{1}{4} \times 4$ in. Designed for use with Dynaco PAT.4 or any other similar high quality stereo control unit. Price: (assembled) £109; (kit) £93.

**SCA-80**

Solid state stereo amplifier. Power output: 50W per channel RMS, 4-16 ohms. HD less than 0.5%. FR 15Hz-50kHz  $\pm 1$ dB. NL: better than -60dB. Inputs: pickup, 3mV, 47K. Controls: tape monitor switch, blend, treble for each channel, rumble filter, bass f or each channel, balance, volume, loudness. Mains powered. Size:  $13\frac{1}{2} \times 4\frac{1}{4} \times 10$ in. Price: (assembled) £142; (kit) £110.

**ST-80 ★**

Solid state stereo amplifier. Power output: 50W per channel RMS. 4-16 ohms. HD less than 0.5%. FR 15Hz-50kHz  $\pm 1$ dB. NL: better than -60dB. Mains powered. Dimensions:  $13\frac{1}{2} \times$

*Duette SA400**Duette SA500**Dynaco PAT-4**Dynaco ST-120**Dynaco ST-80*

★ Indicates entry is illustrated

4½ × 9in. Control unit: Dynaco PAT.4, or others.  
Price: (assembled) £89; (kit) £73.

### ■ DYNATRON RADIO LTD

St Peter's Road, Furze Platt, Maidenhead,  
Berks. Tel: Maidenhead 23331.

#### SA 90 ★

Integrated stereo transistorised amplifier. Output: 45W per channel into 3 ohms. HD: 0.2% at ½dB below rated output. FR: radio/tape 30 Hz-20kHz (±1dB), magnetic PU (RIAA correction) 35Hz-20kHz (±1.5dB). H and N: radio/tape, better than 70dB; PU, better than 66dB. Output impedances: speakers 4-16 ohms, earphones 8 ohms or greater. Inputs: radio 150 mV 68K or greater, tape 150mV 68K or greater, crystal PU (with special impedance match) 75 mV, magnetic PU 2.3mV 47K. Controls: input selector, volume, balance, loudness, stereo/mono, bass, treble, high filter, low filter, tape monitor, speakers (A, A+B, B), channel reverse, on/off. Teak veneer case. Size: 19¼ × 16 × 5¾in. Mains: 110/130, 220/240V. Price: £69.

#### HFC30A ★

Integrated stereo amplifier with record deck incorporated in same cabinet. Controls: mains on-off, volume, bass, treble, input selector, balance. Output: 8W RMS per channel into 3 ohms load. FR: 20Hz-20kHz -3dB at 20Hz and 20kHz. Output impedance: 3-16 ohms. HD: <0.35% -2dB at rated output. Motor unit: Garrard 40B. Cartridge: Goldring G850. Size: 19 × 15 × 7¾in. Finish: teak veneer cabinet with black control panel and transparent plastic lid. Price: £61.50 (plus £14.50 PT).

#### HFC30M

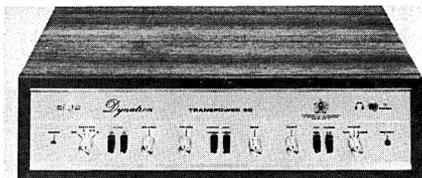
Integrated stereo amplifier with record deck incorporated in same cabinet. Similar specification to HFC30A but manual record deck instead of automatic. Record Unit: Garrard SP25S Mk III. Cartridge: Goldring G850. Price: £61.50 (plus £14.50 PT).

#### HFC90 ★

Integrated stereo amplifier with record deck incorporated in same cabinet. Controls: mains on-off, high filter, low filter, balance, volume, bass, treble, loudness contour, tape monitor, stereo/mono, channel reverse, input selector, speaker switching (A, A+B, B). Output: 45W RMS into 3 ohms. FR: 30Hz-20kHz ±1dB. Output impedance: 3-16 ohms. HD: 0.2% at 0.5dB below rated output into 4-16 ohms. Motor unit: Goldring-Lenco P75. Cartridge: Goldring G800. Size: 19¼ × 17 × 8¾in. Finish: teak veneer. Price: £108.45 (plus £25.55 PT).

### ■ EAGLE INTERNATIONAL

Heather Park Drive, Wembley, HAI 1SU.  
Tel: 01-903 0144.



Dynatron SA90



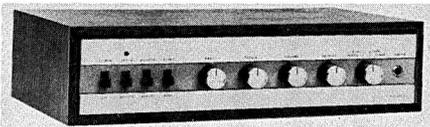
Dynatron HFC30A



Dynatron HFC90



Eagle TSA60



Eagle TSA150

**TSA.60 ★**

Transistorised stereo integrated amplifier. Inputs: PU(1) 5mV 47K, PU(2) 100mV 1 megohm, tape(1) 250mV 100K, tape(2) 150mV 50K, radio 100mV 100K. Bass control  $\pm 10$ dB at 100Hz, treble control  $\pm 10$ dB at 10kHz. FR 30Hz-20kHz  $\pm 2$ dB. HD  $< 1\%$  at 9W RMS. Output: 15W RMS per channel at 8 ohms. Output impedance: 4-16 ohms. 14 transistors, 4 diodes. Mains: 220/240V AC. Size:  $12\frac{3}{4} \times 4\frac{1}{2} \times 9\frac{1}{2}$ in. Price: £39-90.

**TSA.149 ★**

Integrated stereo amplifier. Output: 7W RMS per channel. FR: 25Hz-18kHz. Inputs: magnetic PU 3-5mV, ceramic PU 100mV, tape 200mV, radio 200mV. S/N: better than 50dB. All silicon transistors. Wood cabinet. Size:  $11\frac{1}{4} \times 3\frac{3}{8} \times 8\frac{5}{8}$ in. Price: £26.

**TSA.150 ★**

Integrated stereo amplifier. Output: 7W RMS per channel. FR 30Hz-18kHz. Inputs: mag PU 3-5mV, ceramic PU 100mV, radio 100mV, aux 100mV. S/N better than 50dB. Remote speaker outlet and switch. Size:  $3\frac{1}{8} \times 13 \times 8\frac{1}{2}$ in. Price: £29-60.

**TSA.151 ★**

Integrated stereo amplifier. Output: 15W RMS per channel. FR: 20Hz-40kHz. Inputs: magnetic PU 3mV, ceramic PU 100mV, tape 100mV, radio 200mV. S/N: better than 60dB. Silicon transistors. Wood cabinet. Size:  $13 \times 4 \times 8\frac{3}{4}$ in. Price: £36.

**TSA.250**

Integrated stereo amplifier. Output: 12-5W RMS per channel. FR 25Hz-22kHz. Inputs: mag PU 3mV, ceramic PU 200mV, radio 200mV, aux 200mV. S/N better than 50dB. Size:  $4\frac{1}{4} \times 13 \times 10$ in. Price: £39-60.

**TSA.500**

Integrated stereo amplifier. Output: 25W RMS per channel. FR 20Hz-25kHz. Inputs: mag PU 3mV, ceramic PU 200mV, tape head 1-6mV, radio 280mV, aux 280mV. S/N better than 50dB. Size:  $4\frac{3}{8} \times 13\frac{3}{8} \times 10\frac{1}{4}$ in. Price: £59-60.

**FR.C5**

Stereo frequency response controller. Slide controls give  $\pm 10$ dB adjustment at five frequency channels in the audio spectrum. Operating frequencies: 120Hz, 480Hz, 1-9kHz, 3-8kHz and 7-68kHz. Output: 200mV. Size:  $6 \times 4 \times 5$ in. Price: £29.

**■ FAL**

Futuristic Aids Ltd, Henconner Lane, Leeds 13. Tel: Pudsey 5478.

**Phase 44**

Stereo transistorised integrated amplifier. In-



Eagle TSA149



Eagle TSA151



FAL Phase 25

puts: PU 2-5mV 47K (magnetic), PU 35mV 47K (ceramic), radio 175mV 68K, tape 175mV 68K. Noise level  $-65$ dB all inputs. Outlet for tape 200mV. Controls: treble  $\pm 15$ dB at 14kHz, bass  $\pm 15$ dB at 40Hz, volume, balance, filter  $-6$ dB at 9kHz, 12dB/octave roll-off. Output: 30W per channel into 4 ohms, 20W per channel into 8 ohms, 10W per channel into 15 ohms. HD: 0-05% at 10W RMS 1kHz. FR 10Hz-70kHz at 3dB points. Output impedance: 8 or 15 ohms. Mains: 230-240V AC. Consumption 50W. Size:  $15 \times 9\frac{1}{2} \times 4\frac{1}{2}$ in. Finish: teak veneered cabinet with satin aluminium panel. Price: £42-50.

**Phase 25 'Class A' ★**

Stereo transistorised integrated amplifier. Inputs: PU (magnetic) 2-5mV 47K, radio 175mV 68K, tape 175mV 68K. Noise level  $-70$ dB all inputs. Outlet for tape recorder 200mV. Controls: treble  $\pm 15$ dB at 14kHz, bass  $\pm 15$ dB at 40Hz, volume, balance  $+1$ dB  $-$ zero, filter 9kHz, 12dB/octave roll-off. Output: 12W per channel into 8 ohms, 10W per channel into 15 ohms. HD 0-02% at rated output. FR 15Hz-68kHz at 3dB points at  $-10$ dB full power. Output impedance 8 or 15 ohms. Mains: 230-240V AC. Size:  $14\frac{3}{4} \times 11 \times 4\frac{3}{4}$ in. Finish: teak veneered cabinet with satin aluminium panel. Price: £56.

★ Indicates entry is illustrated

## ■ FERROGRAPH CO LTD

The Hyde, Edgware Road, Colindale,  
London, NW9. Tel: 01-205 2241.

### F307 ★

Stereo amplifier styled to match Ferrograph Series 7 recorder. Per channel: 20W into 8 ohms or 15W into 15 ohms. Total HD less than 0.25% at 1kHz all levels. FR: ( $\pm 1$ dB): 20Hz-25kHz, ( $+1$ dB -3dB) 15Hz-30kHz. Inputs: ceramic PU, tuner and aux, 100mV-5V at 2 megohms; magnetic PU (RIAA), 3mV at 100K, 68K or 47K; tape, 150mV at 50K. Outputs: speaker 8-16 ohms; phones 8 ohms or greater; tape 50K or greater. H and N: less than -65dB (except magnetic PU which is less than -60dB). Bass control  $\pm 17$ dB at 50Hz, treble control  $\pm 13$ dB at 15kHz. Pushbutton low-pass filters -3dB at 10, 7 and 5kHz. Mains: 117/220/240V 50/60Hz. Size:  $16\frac{1}{8} \times 5 \times 9\frac{1}{8}$ in. Price: £62.

## ■ A. R. FRANKLIN

(Audio engineer), 4 Birch House, Penge,  
London, SE20. Tel: 01-659 0912.

### Control unit/mixer

Six-channel mono, or three-plus-three-channel stereo. All inputs 100mV 47K for 1V output into 47K. HD  $< 0.2\%$ . FR 10Hz-68kHz  $\pm 3$ dB. Noise -60dB. Maximum output 3V. Inputs infinitely variable. Headphone position with pre-select listening. Mains: 110-250V 50-60Hz. Size:  $12\frac{1}{2} \times 9 \times 3\frac{1}{2}$ in. Price: £26.

### Stereo control unit/mixer

Four inputs at 800K selected by switching. Microphone mixing independent of selector switch. Controls: treble, bass, balance. Headphone position. HD  $< 0.2\%$ . FR 20Hz-30kHz  $\pm 3$ dB. Maximum output 3V. Microphone input 20mV, other inputs up to 3V. Mains: 110-250V 50-60Hz. Size:  $12\frac{1}{2} \times 9 \times 3\frac{1}{2}$ in. Price: £26.

### Plug-in preamplifiers

Stereo modular preamplifiers for use with above control unit/mixers. For low impedance microphones: £6 and £12. For magnetic pickup with RIAA correction: £6. For tape head: £6.

## ■ GOLDRING MANUFACTURING CO (Great Britain) LTD

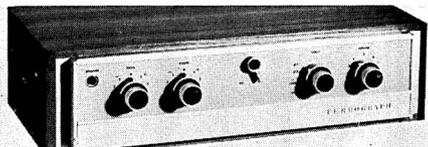
10 Bayford Street, Hackney,  
London, E8 3SE. Tel: 01-985 1152.

### Goldring/Lenco VV7

Stereo pre-amplifier. All transistor. Input: magnetic cartridge, 1mV sensitivity, 47K, NL -60dB. Output: 100mV RMS. Psn 200-240V 50Hz. Dimensions:  $4\frac{3}{4} \times 2 \times 1\frac{1}{2}$ in. Price: £8.50 (plus £2.03 PT).

## ■ GOODMAN'S LOUDSPEAKERS LTD

Downley Road, Havant, Hampshire, PO92NL.  
Tel: Havant 6344. Telex: 86296.



Ferrograph F307



Goodmans Maxamp

## Maxamp 30 ★

Integrated stereo transistorised amplifier. Inputs: pickup 3.5mV 47K or 50mV 100K, radio 100mV 100K, tape 140mV 50K, aux 3mV 50K. Controls: input selector, volume, balance, bass, treble, P-B tape play, P-B LF filter, P-B HF filter, P-B mono/stereo mode, P-B on/off. Indicator light when on. Output: 30W RMS (15W per channel) into 8 ohm load, 20W RMS (10W per channel) into 4 or 15 ohm load. HD less than 0.3% for 15W per channel into 8 ohm load at 1kHz. FR: 20Hz-20kHz  $\pm 1$ dB. Output impedance: 4, 8, 15 ohms. High level signal for tape recorder. Mains: 105, 120, 200, 220, 240V AC 40-60Hz. Size:  $10\frac{1}{2} \times 5\frac{1}{2} \times 7\frac{1}{2}$ in. Price: £54.

## ■ GRAMPIAN REPRODUCERS LTD

19 Hanworth Trading Estate, Feltham, Middx.  
Tel: 01-894 9141.

### Grampian 666 Ambiophonic unit

Enables one to four small speakers to be fed with amplified and delayed signal from main amplifier output. Delay device consists of two parallel springs and transducers as used in Gram- pian reverberation unit. Provides echoes similar

to those produced by room  $32 \times 42$ ft. Volume of delayed signals controllable by listener. Twin high-impedance line-bridging input connections. Output:  $2\frac{1}{2}$ W push-pull power amplifier with 5 ohms and twin 600-ohm outputs. Fully transistorised. Mains: 100-125V or 200-250V. Consumption: 8W. Size:  $18 \times 4\frac{3}{4} \times 5\frac{1}{4}$ in. Weight: 7lb. Price: £65.

**743**

Solid-state mono power amplifier. Input: balanced or unbalanced 600 ohms (to match 10K input) at 800mV for rated output. Output: 50W RMS. Output impedance: 4-8 ohms, 100V line. FR: 100Hz-10kHz +0dB, -1dB; 50Hz-15kHz +0dB, -3dB. HD:  $<1\%$  100Hz-10kHz at rated output. S/N: greater than 70dB. Controls: on-off switch, single gain control giving zero to rated output. Mains: plug-in voltage selection giving 100-125V in 5V steps, 200-250V in 10V steps. Size:  $19 \times 5\frac{1}{4} \times 12\frac{1}{2}$ in. Weight: 32lb. Full specification leaflet on request. Price: £128.

**7431**

Specification as for the 743 but is fitted with  $1\frac{1}{4}$ in peak reading output meter. Price: £134.

**744**

Specification as for the 743 but with 100W RMS output. Weight: 40lb. Price: £142.

**7441**

Specification as for the 744 but with cover over output control and no supply on-off switch. Price: £148-50.

■ **GRUNDIG (Great Britain) LTD**  
Hi-Fi Division, 15 Orchard Street,  
London, W1. Tel: 01-935 4898.

**SV85**

Transistor integrated stereo amplifier and control unit. 31 transistors, 14 diodes. Inputs: mic 7mV at 100K, PU (mag) 3-5mV 47K, PU (crystal) 220mV-3V 1 megohm, radio/tape 220mV 470K. Controls: volume, stereo balance, bass  $\pm 18$ dB at 30Hz, treble  $\pm 18$ dB at 15kHz, pushbutton selector, scratch filter, rumble filter, tape monitoring, slope 1, slope 2, presence. Output: 30W RMS per channel. Distortion  $<0.5\%$ . Outlets: two speakers 4-16 ohms, two 300-ohm phone sockets, two 1.5V 200-ohm line. Stabilised supply to pre-amplifier stages. Mains: 110, 130, 220, 240V 50-60Hz. Consumption 180W maximum. FR 20Hz-20kHz  $\pm 1$ dB. Size:  $20 \times 6 \times 12$ in. Finish: matt walnut. Price: £144.

**SV140 ★**

Transistorised integrated stereo amplifier. Slider controls for balance, volume and five tone ranges. Full overload and mismatch protection. Moving coil meters. 51 silicon transistors, 23 diodes. Inputs: mic 7-5mV 100K, PU (2) 3-7mV 47K for magnetic cartridge, aux 250mV 470K,



Grundig SV140

tuner 250mV 470K, tape 250mV 470K. Tape monitor. Outputs: 1V 600 ohms line, headphones, speakers. Pushbuttons for: tape monitoring, scratch/rumble filters, slope 1, slope 2. Output: 50W RMS per channel. HD: less than 0.5%. Speaker impedance: 4-16 ohms. FR: 20Hz-20kHz  $\pm 1$ dB. Mains: 110-240V 50-60Hz. Finish: oiled teak (matt walnut to special order). Size:  $6 \times 20 \times 12$ in. Price: £194-65.

■ **HEATHKIT** See Constructional Kits Section.

**HECO**

Distributors: Acoustico Enterprises Ltd,  
6-8 Union Street, Kingston-upon-Thames,  
Surrey. Tel: 01-549 3194 (temporary).

**Heco Ampli**

Integrated stereo amplifier. Inputs: magnetic PU 2-4mV 47K, ceramic PU 200mV, radio 250mV 100K, tape 250mV 100K. Noise level: mag PU input 59dB, other inputs 85dB. Tone controls: bass  $\pm 14$ dB at 30Hz, treble  $\pm 16$ dB at 20kHz. Output: 30W RMS per channel into 4 ohms. HD:  $<0.3\%$  at rated output at 1kHz. FR: 10Hz-40kHz -2dB. Output impedance: 4-16 ohms. Mains: 220V 50/60Hz. Size:  $16\frac{1}{4} \times 4\frac{3}{8} \times 10\frac{3}{8}$ in. Price: £75.

**HITACHI SALES (UK) LTD**

Park House, Coronation Road, Park Royal,  
London, NW9. Tel: 01-965 9861. Telex: 932268.

New range of amplifiers being introduced shortly. Details of prices and specifications not available at time of going to press.

**KAMPEL ELECTRONICS LTD**

99 Old Christchurch Road, Bournemouth,  
Hampshire, BHI 1EP.

**Stereo simulator**

Stereophonic source simulator for providing stereo type sound through a stereo system from monophonic radio, records and tapes. Transistorised and battery operated (one PP3 battery lasts three months). In neat case with lead and DIN connector. Full technical specification on

★ Indicates entry is illustrated.

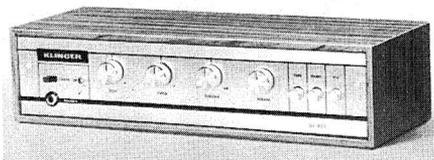
request. Price: £10 (plus 20p packing and postage if ordered direct). Available through hi-fi retailers.

### ■ KLINGER CONTROLS LTD

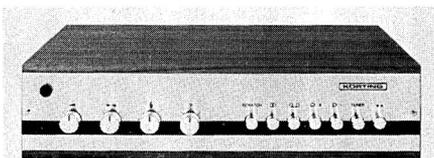
Chalcot Centre, 7 Chalcot Road,  
London, NW1 8LU. Tel: 01-586 2922/3.

#### KC903 ★

Integrated stereo amplifier. Inputs: PU (magnetic) 4mV 47K RIAA, PU (ceramic) 40mV 470K, radio 250mV 470K, tape 250mV 470K. Tape outlet: 250mV 10K. Controls: bass, treble, balance and volume, pushbutton function selectors. Output: 6W RMS per channel into 8 ohms. Output impedance: 8-16 ohms. HD: less than 1% at full output. FR 40Hz-15kHz  $\pm$  2dB. H and N: better than 60dB below full output. Crosstalk: 45dB at 1kHz. Mains: 210-250V 50-60 Hz. 18 transistor plus six diode circuit. Size: 16½ × 4½ × 6in. Weight: 7lb. Finish: teak veneer. Stereo headphone socket on front panel, with automatic speaker muting. Slider on-off switch for mains with indicator light. Price: £28-60.



Klinger KC903



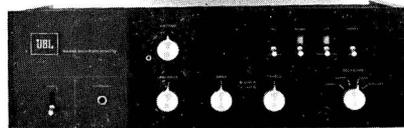
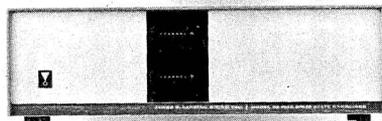
Korting A500

### ■ KORTING

Europa Electronics Ltd, Howard Place,  
Shelton, Stoke-on-Trent, ST1 4NW.  
Tel: Stoke-on-Trent 29316.

#### A500, Type 29833 ★

Stereo amplifier. 21 transistors. Push-buttons for stereo, scratch, tape, pickup 1 and 2, tuner and on/off. Controls: treble, bass, balance and volume, with indicator lamp. Sockets: diode output for tuner; crystal, ceramic or magnetic pickup; tape recorder; speakers. Output: 10W per channel. Drift power transistors and triple negative feedback. Cabinet in natural walnut colour, satin finish. Size: 3½ × 14 × 9in. Price: approximately £45.



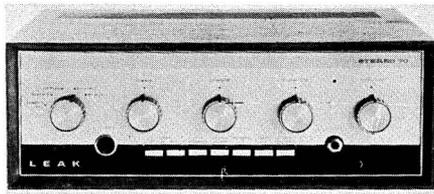
### ■ JAMES B. LANSING

Distributors: Feldon Recording Ltd,  
126 Great Portland Street, London, W1.  
Tel: 01-580 4314.

#### JBL Graphic Controller SG250 ★

Stereo control unit. Inputs: (pickup 1) 1-6mV 47K, (pickup 2 or tape head) 1-6mV 47K, mic 50-200mV at high impedance, tape 250mV adjustable, aux(2) 250mV to 3V adjustable at 35K, (radio 1) 200mV 35K, (radio 2) 300mV to 2V adjustable at 35K. Output: line 600mV to 3V adjustable. HD: 0-13% at all frequencies and all power levels. Controls: sliders for treble left and right, sliders for bass left and right, sliders for volume and balance, switches for stereo, stereo reverse, channel A, channel B, A+B test, rumble filter, scratch filter, test tone (1 kHz) and tape monitor. Noise level: (low level) -84dB;

JBL amplifiers and controller



Leak Stereo 30 Plus

(high level) -91dB. Designed to operate with JBL SE460 main energiser or any good quality amplifier. Mains: 110-240V AC. Size: (front panel)  $15\frac{3}{4} \times 6\frac{5}{8}$ in; (remainder)  $14\frac{1}{4} \times 6 \times 11\frac{1}{2}$ in. Price: £236.

**JBL SE460 Energiser**

Stereo power amplifier. Output: 60W RMS per channel. FR: (tone controls flat) 20Hz-20kHz  $\pm 0.25$ dB, 3Hz-175kHz  $\pm 1.5$ dB at all powers. Plug-in equaliser boards. HD: 0.13% 20Hz-20kHz. Noise level: -90dB below rated output. Input voltage: 300mV to 3V. Output impedance: 4-16 ohms. Designed for studio monitors but also suitable for use with JBL Graphic Controller or other good-quality stereo control unit. Mains: 110-240V AC. Size:  $15\frac{1}{4} \times 4\frac{5}{8} \times 7$ in. Price: £184.

**JBL SA660**

Integrated stereo amplifier. Inputs: (pickup 1) 4, 8 or 16mV 47K, (pickup 2) 4, 8 or 16mV 47K, aux 250mV 35K, radio 250mV 35K. Noise level: pickup inputs -72dB, -75dB and -78dB respectively, other inputs -85dB. Controls: volume, bass left, bass right, treble left, treble right, balance, loudness, test, tape monitor. Output: 60W RMS per channel into 8 ohms, 80W RMS per channel into 4 ohms. HD: <0.15% at all frequencies and any power. FR: 20Hz-20kHz  $\pm 0.25$ dB. Noise level: (main amplifier) -94dB. Output impedance: 4-16 ohms. Mains: 110-240V 50/60Hz. Size:  $15\frac{3}{4} \times 4\frac{3}{4} \times 11\frac{7}{8}$ in. Price: £228

■ **LEAK**

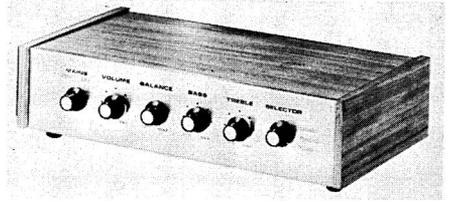
Rank Wharfedale Ltd,  
Bradford Road, Idle, Bradford, Yorks.  
Tel: Bradford 612552. Telex: 51407.

**Stereo 30 Plus ★**

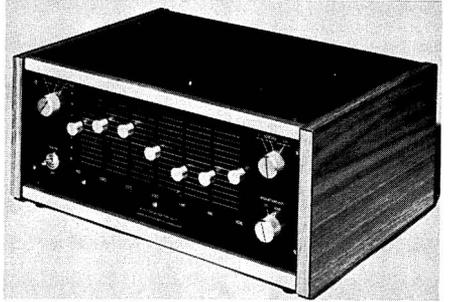
Transistorised integrated amplifier. Inputs: PU(1) 2mV 47K; PU(2) Hi sensitivity 10mV 33K; Lo sensitivity 30mV 100K; tuner/mic 25mV 47K; tuner(2) Hi sensitivity 60mV 50K; Lo sensitivity 250mV 50K; replay 400mV 47K. Output: 15W per channel 8 ohms. 10W per channel 15 ohms. 20W per channel 4 ohms. Controls: input, bass, treble, balance, filter, volume, tape monitor. 6kHz filter. Headphone socket. H and N 87dB. HD 0.1% up to 12W at 1kHz into 8 ohms. Mains: 110-250V 40-60Hz. Size:  $13 \times 4\frac{1}{4} \times 8\frac{3}{4}$ in. Price: Chassis Model £56.50, Cabinet Model £62.50.

**Stereo 70**

Transistorised integrated amplifier. Inputs: PU(1) 2mV 47K RIAA, PU(2) 10mV 33K RIAA, radio 250mV 47K or 2mV 47K, aux 60mV 50K or 250mV 50K, tape replay 400mV 47K. Controls: bass  $\pm 16$ dB at 50Hz, treble +16dB at 14kHz, volume, balance (zero to max



Lewis Audio SA55



Leavers-Rich A501

on each channel), input selector, pushbuttons for mode, tape monitor, treble filter, speaker, on/off. Output: 35W RMS per channel into 8 ohms, 28W RMS per channel into 15 ohms. HD 0.1% all powers up to 25W RMS. FR 30Hz-20kHz  $\pm 1$ dB. Mains: 110, 117, 130, 210, 230, 250V 40/60Hz. Consumption: 150 volt-amps. Size: (chassis)  $13 \times 4\frac{1}{4} \times 8\frac{3}{4}$ in; (cabinet)  $13\frac{1}{2} \times 4\frac{3}{4} \times 9\frac{3}{4}$ in. Panel cut-out  $12\frac{1}{2} \times 4$ in. Price: (chassis model) £69; (cabinet model) £75.

■ **LEEVERS-RICH EQUIPMENT LTD**

319 Trinity Road, Wandsworth,  
London, SW18. Tel: 01-874 9054/6.  
Cables: Leemag, London, SW18.

**7 Band Audio Equaliser Model A501 ★**

Wide range equaliser covering spectrum in 7 separately adjustable and overlapping bands, suitable for use in transcription to match widely differing recordings to a common quality standard. Price: £195.

■ **LEWIS AUDIO**

Louis & Lewis (Electronics) Ltd,  
154-155 High Street, Brentford, Middlesex.  
Tel: 01-560 1161.

**SA55 ★**

Integrated stereo amplifier. Inputs: ceramic PU 50mV into 1 megohm, radio 100mV into 1 meg-

★ Indicates entry is illustrated

ohm, tape 100mV into 100K. FET preamplifier stage. Controls: bass  $\pm 13$ dB at 50Hz, treble  $\pm 15$ dB at 10kHz, balance, volume, input selector, mains on-off. Output: 6W RMS per channel. DIN sockets wired to international standards for inputs and speaker connections. Output impedance: 8-15 ohms. AC mains 200-240V (other voltages available to order). Finish: teak. Size:  $14 \times 3\frac{1}{2} \times 8$ in. Price: £18.90.



Lowther LL26 amplifier

## ■ LOWTHER MANUFACTURING CO

Lowther House, St Mark's Road,  
Bromley, Kent, BR29HQ.

Tel: 01-460 5225. Cables: Lowther, Bromley.

### L18 amplifier

18W. Distortion  $< 0.1\%$ . Input for specified output 0-75V. Response 20Hz-40kHz  $\pm 1$ dB. Feedback 20dB. Noise level -85dB. Output impedance 16 ohms with adjustment. Output: EL506 distributed load circuitry. Pat. Size:  $12 \times 6 \times 6$ in. To operate with SCU/T control unit. Price: £25.50.

### LL26 Mk II amplifier ★

26W. Dist  $< 0.1\%$ . Input for spec output 0-75V. Response 20Hz-70kHz  $\pm 1$ dB. Feedback 22dB. NL -90dB. Output imp 16 ohms with adjustment. Output: EL34s. Lowther linear. Size:  $11 \times 12 \times 7\frac{1}{2}$ in. Weight: 33lb. To operate with SCU/T control unit. Price: £47.

### L18S stereo amplifier

18W output on each channel. Distortion 0-1%. Input for specified output 0-75V. Response 20 Hz-40kHz  $\pm 1$ dB. Noise level -85dB. Output imp 8-4 or 16 ohms. Output EL506 ultra linear. Size:  $11 \times 12 \times 7\frac{1}{2}$ in. To operate with SCU/T control unit.

### L.1.A20

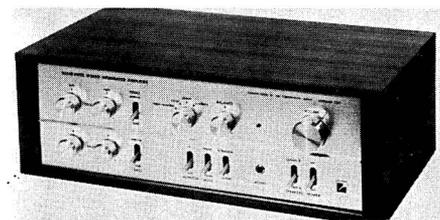
Integrated stereo amplifier with Class A output. Inputs: magnetic PU 1-10mV (switched 47K RIAA); radio 100mV, aux 100mV, tape record and replay. Output: 10W RMS per channel into 15 ohms. HD: 0-1%. H and N:  $> 65$ dB RIAA. Controls: bass  $\pm 16$ dB at 50Hz, treble  $\pm 16$ dB at 15kHz. Low filters: (switched) 40Hz, 80Hz, 160Hz, 270Hz. High filters: (switched) 3-2kHz, 4-5kHz, 9kHz and 11kHz. Balance control: zero to maximum each channel. Switch for main speaker, auxiliary speaker and phones. DIN correction. AC outlet sockets. Mains: 110, 220, 240V 40-60Hz. Finish: teak or walnut cabinet with satin chrome panel (or black Perspex with rear lighting). Size:  $15 \times 5\frac{3}{4} \times 12\frac{3}{8}$ in. Price on application.

### SCU/T ★

Stereo control unit. Output: 0-750mV RMS per channel at 5K. Specification as L.1.A20. Price on application.



Lowther SCU/T



Lux SQ707



Lux SQ503



Lux SQ507

## ■ LUX

Howland-West Ltd, 2 Park End, South Hill Park, London, NW3.  
Tel: 01-794 6666/6033.

### SQ707 ★

Integrated stereo transistor amplifier. Inputs: PU 2mV 50K, radio 120mV 50K, tape recorder 120mV 50K, aux 120mV 50K. Noise level: -60dB on magnetic PU, -65dB all other inputs. Controls: two bass, two treble, mild/intense tone operation, function selector, volume, mono/stereo, balance, A/B speaker switch for two systems. Output: 17W RMS per channel into 8 ohms, 20W RMS per channel into 4 ohms. HD: <1% at maximum output. FR: 30Hz-30kHz  $\pm$  1dB. Output impedance: 8 ohms. Mains: 240V AC. Size: 14 $\frac{3}{4}$   $\times$  5  $\times$  9in. Polished wood veneered case. Price: £59.

### SQ503 ★

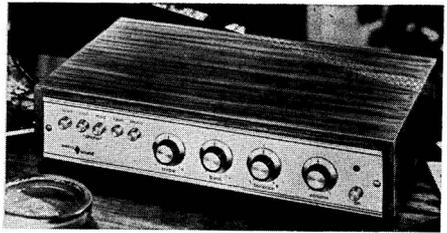
Integrated stereo transistor amplifier. Inputs: PU 2mV 50K, radio 120mV 150K, tape play 120mV 150K, aux(1) 1V 1 megohm, aux(2) 120mV 150K. Controls: two bass, two treble, monitor on-off, main/remote speakers, bass switch 400Hz-200Hz, treble switch 2kHz-4kHz, mono/stereo, volume, balance, function selector. Output: 30W RMS per channel into 8 ohms. FR 20Hz-50kHz -2dB. Noise level: -60dB on PU, -70dB all other inputs. Output impedance: 8 ohms. Mains: 100, 117, 220, 240V AC. Size: 17 $\frac{1}{2}$   $\times$  6 $\frac{3}{8}$   $\times$  10 $\frac{1}{8}$ in. Polished wood veneered case. Price: £88.

### SQ202

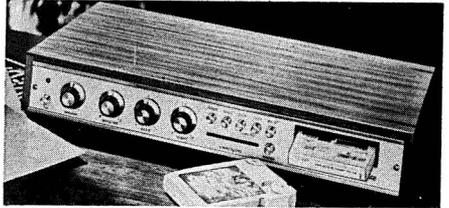
Integrated stereo transistor amplifier. Inputs: PU(1) 2mV 30-100K, PU(2) 2mV 30-100K, microphone-mixer 2.5mV 50K, aux(1) 110mV 100 ohms, aux(2) >110mV 100K, aux(3) 110mV 100K. Noise level: -66dB on PU and mic inputs, -80dB on all other inputs. Comprehensive range of 25 controls. Output: 80W RMS per channel into 8 ohms. HD: <0.05% at 5kHz. FR 20Hz-70kHz at less than  $\pm$  1dB. Output impedance: 8 ohms. Size: 18 $\frac{7}{8}$   $\times$  6 $\frac{1}{2}$   $\times$  11in. Price: £210.

### SQ507 ★

Integrated stereo transistor amplifier. Inputs: PU(1) 2mV 30-100K, PU(2) 2mV 50K, tape play 100mV 100K, aux(1) 100mV adjustable at 100K, aux(2) 100mV 200K. Noise level: -60dB PU and aux(1) inputs, -70dB other inputs. Controls: two bass, two treble, turnover frequency selectors (bass 150, 300, 600Hz; treble 1.5, 3, 6kHz), twin speaker systems switch, balance, low boost (80Hz 6dB/octave), high cut (5kHz-6dB/octave). Output: 60W RMS per channel at 8 ohms. FR 20Hz-50kHz less than 1dB. Output impedance 8 ohms. Mains: 100, 117, 220, 240V AC. Size: 17 $\frac{1}{2}$   $\times$  6 $\frac{3}{8}$   $\times$  10 $\frac{1}{8}$ in. Price: £124.



*Metrosound ST20E*



*Metrosound SS30E*

## ■ METROSOUND

Metrosound Manufacturing Co Ltd,  
Audio Works, Cartersfield Road,  
Waltham Abbey, Essex.  
Tel: Waltham Cross 31933.

### Metrosound ST20E ★

Transistorised stereo amplifier. Output: 10W RMS per channel. HD: less than 1% at rated output. FR: 30Hz-30kHz  $\pm$  2dB at rated output. Noise level: -70dB. Inputs: mag PU 2.5mV, ceramic PU 150mV, radio 150mV. Output impedance: 8 ohms. Mains: 200-250V AC. 20 transistors, 2 diodes. Controls: pushbutton controls for mains on/off, mono/stereo, tape, tuner, mag PU, ceramic PU. Rotary controls for treble, bass, balance and volume. Bass control:  $\pm$  12dB at 40Hz. Treble control:  $\pm$  12dB at 14kHz. Tape outlet: 300mV per channel at 5K. Automatically switchable headphone socket, 4-16 ohms. Finish: anodised brushed silver facia with polished trim and knobs, teak veneer cabinet. Size: 3 $\frac{1}{2}$   $\times$  15 $\frac{1}{4}$   $\times$  10in. Price: £39.50.

### Metrosound SS30E ★

Transistorised stereo amplifier with tape cartridge playing facility incorporated. 24 transistors, 5 diodes. Output: 10W RMS per channel. HD: less than 1% at rated output. FR: 30Hz-30kHz  $\pm$  2dB at rated output. Noise level: -70dB. Inputs: mag PU 2.5mV, ceramic PU 150mV, radio 150mV. Output impedance: 8 ohms. Mains: 200-250V 50-60Hz. Controls: pushbutton controls for mains on/off, mono/stereo, tape, tape programme selector, tuner, magnetic PU, ceramic PU. Rotary controls for treble,

★ Indicates entry is illustrated

bass, balance and volume. Bass control:  $\pm 12$ dB at 40Hz. Treble control:  $\pm 12$ dB at 14kHz. Balance control: either channel may be faded to zero without affecting the other. Tape output: 300mV at 5K. Automatically switchable headphone socket, 4-16 ohms. Tape cartridge system. Speed  $3\frac{1}{2}$  i/s. W and F: less than 0.3%. FR 40Hz-12kHz  $\pm 3$ dB. H and N: -45dB. Eight-track stereo tape cartridge. Size:  $3\frac{1}{2} \times 20\frac{3}{8} \times 10$ in. Price: £84-80 (including PT).

## ■ MILLBANK ELECTRONICS

The Square, Forest Row, Sussex.  
Tel: Forest Row 2288.

### MTA301

Transistorised mono power amplifier. Output: 30W RMS. HD: 0.3%. FR: 30Hz-20kHz -3dB. Noise level: -90dB for stated output. Input: 4.5mV. Output impedance: 4, 8, 16 ohms. Mains: 220-250V AC. Size:  $19\frac{1}{2} \times 14\frac{1}{8} \times 4\frac{1}{2}$ in. Price: £67-60.

### MTA501

Transistorised mono power amplifier. Output: 50W RMS. HD: 0.3%. FR: 30Hz-20kHz -3dB. Noise level: -90dB for stated output. Input: 4.5mV. Output impedance: 4, 8, 16 ohms. Mains: 220-250V AC. Size:  $19\frac{1}{2} \times 14\frac{1}{8} \times 4\frac{1}{2}$ in. Price: £84-20.

### MTA1001

Transistorised mono power amplifier. Output: 100W RMS. HD: 0.3%. FR: 30Hz-20kHz -3dB. Noise level: -90dB for rated output. Input: 4.5mV. Output impedance: 4, 8, 16 ohms. Mains: 220-250V AC. Size:  $19\frac{1}{2} \times 14\frac{1}{8} \times 4\frac{1}{2}$ in. Price: £110.

### Module 070

Magnetic cartridge preamplifier. Two inputs: 5mV 47K. Two outlets: 3.5V max. Gain control. Power requirements: 24V 6mA. Size:  $4 \times 2$ in. Price: £8-50.

### Module 071

Tape head preamplifier. Two inputs: 3.5mV 47K. Two outlets: 500mV. Gain control. Power requirements: 24V 6mA. Size:  $4 \times 2$ in. Price: £8-50.

Various other input preamplifier modules available. Full details on request.

## ■ MULLARD LTD

Mullard House, Torrington Place,  
London, WC1. Tel: 01-580 6633.

### Unilex

See Constructional Kits Section for details of Mullard preamplifier and amplifier modules for the home constructor.

## ■ NATIONAL PANASONIC

Distributors: Unamec Ltd, PO Box 1,  
United Africa House, Blackfriars Road,  
London, SE1. Tel: 01-928 2070.

### Panasonic SA-73 ★

Solid-state stereo amplifier. Output: 16W RMS per channel. FR: 10Hz-50kHz  $\pm 1$ dB. S/N: 88dB aux, 74dB PU. Controls: bass, treble, loudness, low filter, high filter, selector switch, volume. HD: 0.5% at rated output. Output impedance: 4/8 ohms. Size:  $16 \times 5 \times 11\frac{1}{2}$ in. Mains: 110, 120, 220, 240V AC. Full specification on request. Price: £73-50.

## ■ NIKKO

Nikko Electric Mfg Co Ltd,  
Distributors: Howland-West Ltd,  
2 Park End, South Hill Park, London, NW3.  
Tel: 01-794 6666 and 6033.

### Nikko TRM-30 ★

Integrated stereo transistorised amplifier. Output: 10W per channel. FR ( $\pm 1$ dB): 15Hz-20kHz. Output impedance: 4-16 ohms. Noise level: 60dB. Inputs: tape 1.8mV, magnetic PU 2.8mV 50K, tuner 300mV, aux 200mV. Controls: function, volume, balance, loudness, bass, treble, tape/source, mono-stereo reverse, rumble, scratch. Size:  $12 \times 9\frac{1}{2} \times 3\frac{1}{2}$ in. Mains: 110-120, 210-240V AC. Price: £35-50.

### TRM-40IC

Integrated stereo transistor amplifier and control unit. Inputs: tape head 2mV, PU (mag) 4mV, radio 500mV, PU (crystal) 300mV. Controls: function, volume, bass (each channel), treble (each channel), balance, mode, tape monitor, loudness, rumble filter, scratch filter, on/off, stereo headphone jack. Output: 15W RMS at 8 ohms. HD  $< 1\%$  at stated output. FR 15Hz-20kHz  $\pm 1$ dB. Noise level better than 60dB. Output impedance 4-15 ohms. Mains supply. Size:  $11\frac{1}{2} \times 9\frac{1}{2} \times 3\frac{3}{8}$ in. Price: £48.

### TRM-50 ★

Solid state stereo amplifier. Power output: 4-16 ohms, 17W per channel RMS. HD less than 0.9%. FR 10Hz-50kHz  $\pm 1\frac{1}{2}$ dB. Noise level -65dB. Mains powered. Dimensions:  $8.4 \times 6.5 \times 2.4$ in. Price: £59.

### TRM-1200 ★

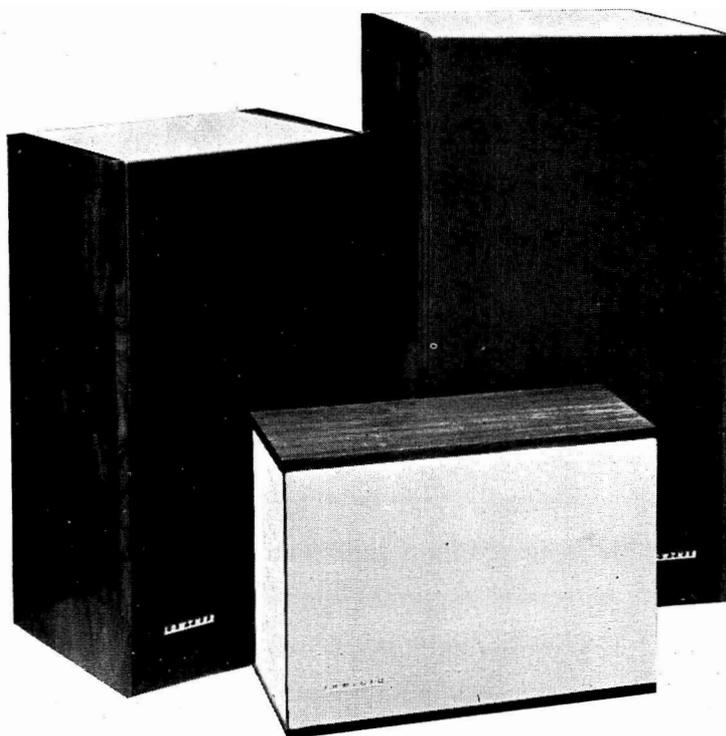
Integrated transistor stereo amplifier. Inputs: mic 2mV 50K, tape 220mV 100K, PU 1.2mV 50K, radio 220mV 100K, aux 220mV 100K. Signal to noise: tape, tuner and aux inputs 85dB; mic and PU 70dB. Controls: function, volume, balance, tone controls in/out, low filter, high filter, speaker switching, mode, tape monitor on/off, bass right, bass left, treble right, treble left, on/off, meter level control, loudness. Output: 40W RMS into 8 ohms. HD 0.9% at rated out-

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ST. MARK'S ROAD,  
BROMLEY, KENT.

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Tripletone Manufacturing Co. Ltd., Factory No. 1, 138 Kingston Road, London S.W.19.



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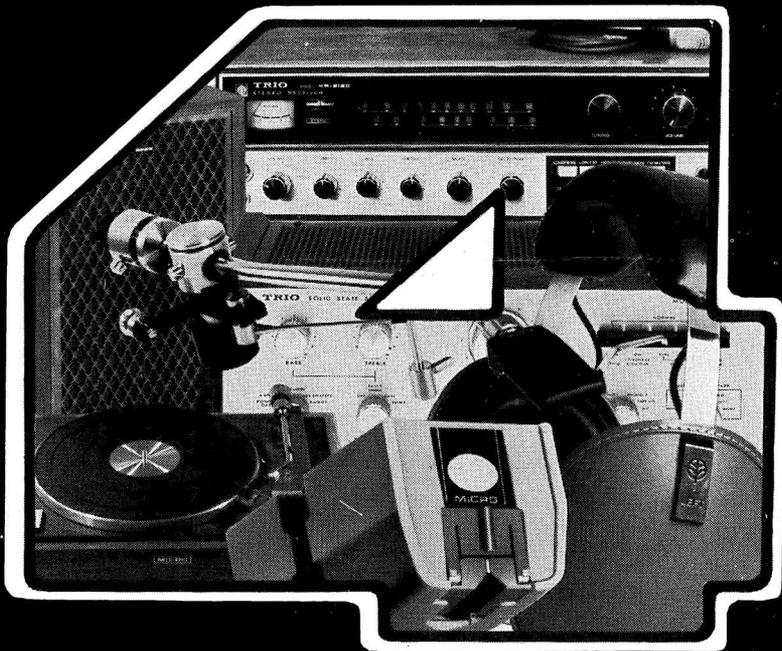
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exclusive United Kingdom distributors



**b.h. morris & co. (radio) ltd**

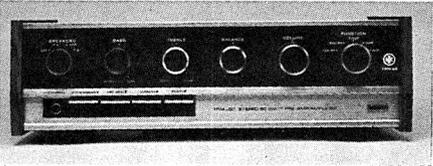
84-88 Nelson Street, London E.1 Tel: 01-790 4824



National Panasonic SA73



Nikko TRM-30



Nikko TRM-50



Nikko TRM1200

put. FR 13Hz-50kHz  $\pm 1$ dB at 30W. Output impedance: 4-16 ohms. Mains: 117-240V 50/60 Hz. Size:  $15\frac{1}{4} \times 12\frac{1}{4} \times 4\frac{1}{2}$ in. Price: £98.

**■ NIVICO**

Denham & Morley Ltd, Denmore House  
453 Caledonian Road, London, N7.  
Tel: 01-607 6568. Telex: 24562.

**5007B**

Integrated stereo amplifier. Inputs: mag PU 3mV, crystal pickup 150mV, aux 100mV. S/N: PU inputs 60dB, aux input 72dB. Bass control:  $\pm 9$ dB at 100Hz, Treble control:  $\pm 9$ dB at 10 kHz. FR: 30Hz-25kHz +0dB -1dB. Output: 12W per channel. HD:  $<0.2\%$  at 1kHz. Mains: 100-240V AC. Price: £39.

**SEA-100E**

Control unit incorporating sound-effect pre-

amplifier. Sound-effect centre frequencies: 60 Hz, 250Hz, 1kHz, 5kHz, 15kHz (all adjustable  $\pm 10$ dB). FR: 20Hz-30kHz +0dB -0.5dB. Output: 1V. THD:  $<0.1\%$  at rated output. Input: 500-800mV. S/N: better than 70dB. Input impedance: (normal) 100K, (high) 700K. Output impedance: 1K. Mains: 100-240V 50/60Hz. Size:  $10\frac{3}{8} \times 4\frac{3}{4} \times 11\frac{1}{2}$ in. Weight: 6 $\frac{1}{2}$ lb. Controls: Mains on-off, SEA over-ride, impedance selector, five SEA sliders. Price: £46.50.

**MCA-V7**

Integrated amplifier with sound field composer (SFC) for producing four-channel stereo from two-channel sources. Inputs: mag PU 1mV, radio 50mV, tape play 50mV. Tone controls: (bass)  $\pm 10$ dB at 100Hz, (treble)  $\pm 10$ dB at 10 kHz. FR: 20Hz-40kHz +0dB -1.5dB. Output: 45W per channel into 8 ohms (two channels), 15W per channel into 8 ohms (four channels). Output impedance: 4-16 ohms. THD:  $<0.2\%$  at 1kHz at rated output. Damping factor: 50 at 8 ohm load. Mains: 100, 117, 220, 240V 50/60Hz. Consumption: 160W. Size:  $17 \times 5\frac{1}{2} \times 12$ in. Weight: 22lb. Price: £110.

**MCA-104EB**

Integrated stereo amplifier with sound-effect preamplifier. Inputs: mag PU (1) 3mV, mag PU (2) 1mV, tape head 1mV, aux 120mV. Sound-effect preamplifier centre frequencies: 60Hz, 250Hz, 1kHz, 5kHz, 15kHz (all adjustable  $\pm 10$ dB). Output: 16W per channel into 8 ohms. Output impedance: 8-16 ohms. THD:  $<0.8\%$  at 1kHz at rated output. FR: 20Hz-20kHz  $\pm 0.5$ dB. Damping factor: 25 at 8 ohms load. Equalisation: (PU) RIAA, (tape head) NAB. Outputs for speakers and headphones. Mains: 100-240V 50/60Hz. Size:  $16 \times 5\frac{3}{8} \times 12\frac{1}{4}$ in. Weight: 15.4lb. Price: £72.

**MCA-105E**

Integrated stereo amplifier with sound-effect preamplifier plus built-in pink noise generator. Inputs: PU (2) 1mV 47K, radio 30mV 100K, tape play (2) 30mV 100K, mic 1mV 47K, aux (2) 30mV 100K. Sound-effect preamplifier centre frequencies: 40/60Hz, 150Hz, 400Hz, 1kHz, 2.4kHz, 7kHz, 15kHz (all adjustable  $\pm 10$ dB). Output: 60W per channel into 4 ohms, 50W per channel into 8 ohms. Output impedance: 4-16 ohms. THD:  $<0.5\%$  at 1kHz at rated output. Damping factor: 50 at 8 ohms load. Equalisation: (PU) RIAA. Mains: 100-240V 50/60Hz. Consumption: 145W maximum. Size:  $17\frac{3}{8} \times 5\frac{1}{8} \times 15\frac{3}{8}$ in. Weight: 25.3lb. Price: £130.50.

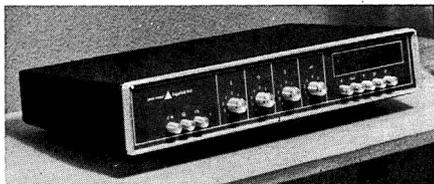
**■ PEAK SOUND**

Peak Sound (Harrow) Ltd, 32 St Judes Road, Englefield Green, Egham, Surrey.  
Tel: Egham 5316.

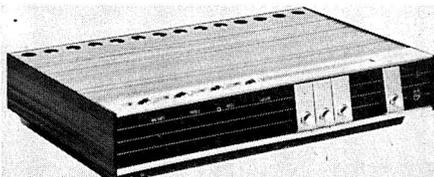
★ Indicates entry is illustrated

### 840A ★

Integrated stereo amplifier. Inputs: magnetic PU 2.8mV 47K, microphone 5mV, radio 80mV, tape 80mV. Pickup input overload factor 100mV (32dB). S/N: PU input better than 67dB, other inputs 64dB. Crosstalk: -54dB at 1kHz. HD: 0.08% at 1kHz at all powers up to 20W RMS. Output: 20W RMS per channel into 8 ohms. FR: 35Hz-30kHz. Controls: volume, bass  $\pm 16$ dB at 40Hz, treble  $\pm 14$ dB at 10kHz, balance, push-button input selector. Headphone socket and speaker muting switch. Swing-up lid for easy access to connections. Cabinet stands flush to wall. Space provided to accommodate Englefield FM tuner. Mains: 110/250V AC. Two mains outlets (one switched). Steel case covered with simulated black leather. Guaranteed for five years. Size:  $16\frac{1}{4} \times 4\frac{1}{4} \times 11$ in. Price: £45.



Peak Sound 840A



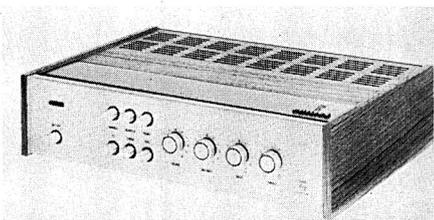
Philips RH580

### PHILCO-FORD

Philco International Ltd, 42 Leicester Square, London, WC2H7LR. Tel: 01-930 7667.

### M1550

Integrated stereo amplifier. Output: 12W RMS per channel. Inputs: magnetic PU, ceramic PU, tape recorder, radio. Push-button input selectors. Controls: bass, treble and balance. Connections to DIN standard. Finish: white satin. Size:  $15\frac{3}{8} \times 8 \times 4$ in. Price: £39.95.



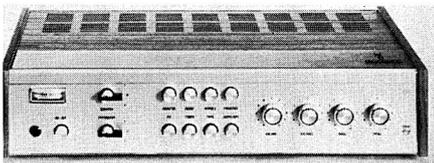
Philips RH590

### PHILIPS ELECTRICAL LTD

Century House, Shaftesbury Avenue, London, WC2. Tel: 01-437 7777.

### RH-580 ★

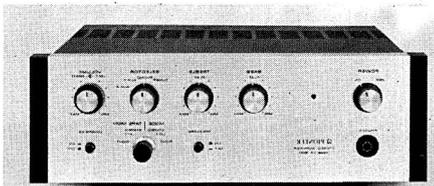
Solid state stereo amplifier. Power output: 6W per channel RMS into 8 ohms: provision for 4 ohms (reduced power). HD: <1.5% at 5W per channel. FR: 50Hz-20kHz 3dB down for 6W. Noise level: 55dB below 6W (overall). Output transistors: two AD161/162. Psn 110, 127, 220, 240V. Inputs: magneto/dynamic pickup 3mV, 47K; crystal pickup 100mV, 60K; tuner and tape 100mV 140K; all -55dB overall for 6W. Controls: volume (with bass compensation +8 dB max at 65Hz); bass  $\pm 13$ dB at 65Hz; treble +11 to -10dB at 10kHz; balance. Dimensions:  $2\frac{7}{8} \times 13\frac{1}{8} \times 8\frac{1}{2}$ in. Price: £29.



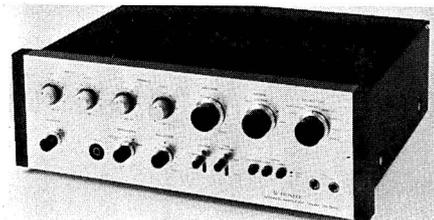
Philips RH591

### RH590 ★

Solid state stereo amplifier. Power output: 10W per channel RMS into 8 ohms (4 ohms at reduced power). HD: <1%. FR: 20Hz-20kHz 3dB down. Distortion: 1%. NL: 80dB below 10W. Output transistors: four AD149. Psn 110, 127, 220, 240V. Dimensions:  $3\frac{7}{8} \times 14\frac{1}{8} \times 10$ in. Inputs: magneto/dynamic pickup 3mV, 47K; crystal pickup, tape and tuner 100mV, 100K each, -80dB overall for 10W out. Controls:



Pioneer SA-500



Pioneer SA900

volume (with bass compensation +8dB max at 50Hz); treble +14dB at 10kHz; bass +16 to -14dB at 50Hz; balance; rumble 12dB/octave 3dB down at 100Hz; scratch 12dB/octave 3dB down at 6kHz. Dimensions:  $3\frac{3}{8} \times 14\frac{1}{2} \times 10$ in. Price: £52.

#### RH591 ★

Solid state stereo amplifier. Power output: 25W per channel at 8 ohms (4 ohms at reduced power). HD: 0.3% at 20W per channel. FR: 20Hz-50kHz 3dB below 20W. NL: 80dB below 20W. Output transistors: four BDY20. Psn 110, 127, 220, 240V. Inputs: magneto/dynamic pickup 3mV, 50K; tape, tuner, aux/tape monitor ceramic pickup 100mV, 500K. Controls: volume (2-position loudness); bass  $\pm 16$ dB at 50Hz; treble +14 to -16dB at 10kHz; rumble 12dB/octave 1-3dB at 80Hz; scratch 12dB/octave -3dB at 10kHz. -3dB at 5kHz; loudness 1, 3dB at 10kHz, 7dB at 50Hz; loudness 2, 7dB at 10kHz, 16dB at 50Hz; presence (switchable) +3dB at 3kHz. Psn 110, 127, 220, 240V. Dimensions:  $3\frac{3}{8} \times 16\frac{1}{2} \times 10\frac{3}{8}$ in. Price: £79.

#### ■ PIONEER

Distributors: Shriro (UK) Ltd,  
42 Russell Square, London, WC1B 5DF.  
Tel: 01-580 6996.

#### SA500 ★

Integrated stereo amplifier. Inputs: magnetic PU 2.5mV 47K, radio 200mV 100K, tape 200mV 100K, aux 200mV 100K. Noise level: PU input 75dB, other inputs 90dB. Controls: bass  $\pm 13$ dB at 50Hz, treble +8dB -11dB at 10kHz, loudness +12dB at 50Hz, +5.5dB at 10kHz. Output: 13W RMS into 8 ohms. HD: <0.5% at 1kHz. FR: 20Hz-50kHz  $\pm 1$ dB. Output impedance: 4-16 ohms. Mains: 110, 117, 130, 220, 240V AC. Size:  $13 \times 4\frac{3}{8} \times 12\frac{3}{8}$ in. Price: £61-92.

#### SA700

Integrated stereo amplifier. Inputs: magnetic PU (2) 3mV, radio 200mV, tape 200mV, aux 200mV. Controls: bass +12dB -9dB at 100Hz, treble +9dB -12dB at 10kHz, loudness +13dB at 50Hz, +4dB at 10kHz, low filter -8.4dB at 50Hz, high filter -7.8dB at 10kHz, muting -20dB. Output: 34W RMS into 8 ohms. HD: <0.05% at 20W output. FR: 20Hz-40kHz  $\pm 1$ dB. Output impedance: 4-16 ohms. Mains: as for SA500. Size:  $14\frac{3}{8} \times 4\frac{3}{8} \times 12\frac{3}{8}$ in. Price: £97-97.

#### SA900 ★

Integrated stereo amplifier. Inputs: magnetic PU (2) 3.1mV 50K, tape (2) 180mV 150K, radio 180mV 200K, aux (2) 180mV 180K. Noise level: PU inputs better than 80dB, other inputs better than 95dB. Controls: bass (2) +12dB -9dB at 100Hz, treble (2) +9dB -12dB at 10kHz, loudness +7dB at 10kHz, +14dB at 50Hz, low



Quad 33 control unit



Quad 50E power amplifier

filter -6dB (12dB per octave at 50Hz), high filter -6dB (12dB per octave at 10kHz), muting -20dB. Output: 60W RMS per channel into 8 ohms. HD: <0.08% at 45W at 1kHz. FR: 20Hz-50kHz  $\pm 1$ dB. Output impedance: 4-16 ohms. Mains: 110, 117, 130, 220, 240V AC. Size:  $16 \times 5\frac{1}{2} \times 13\frac{3}{8}$ in. Price: £133-83.

#### ■ QUAD

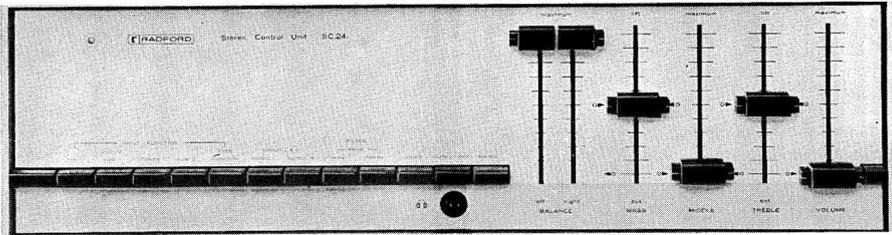
Acoustical Manufacturing Co Ltd,  
St Peter's Road, Huntingdon, Hunts.  
Tel: Huntingdon 2561/2. Cables: Acoustical.

#### Quad 33 control unit ★

Transistorised mono/stereo control unit. Inputs: PU from 2mV, radio(1) 100mV 100K, radio(2) 100mV 100K, tape from 100mV 40K. Signal-to-noise level: -70dB on PU, -85dB on all other inputs. Output: 0.5V. Controls: volume, balance, bass, treble, filter slope, filter frequency. Mains powered. Designed for use with Quad 303 amplifier but suitable for operation with other high quality equipment. Size:  $10\frac{1}{4} \times 3\frac{3}{8} \times 6\frac{1}{2}$ in. Price: £43.

#### Quad 50/E ★

High quality transistor power amplifier primarily intended for professional and industrial use. Input: 500mV RMS into 14 to 50K according to gain control setting for 50W output, or standard



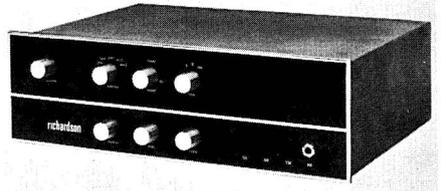
Radford SC24



Quad 303 power amplifier



Revox A50



Richardson Electronics SIA100

600-ohm line bridging input. Output: 50W RMS. Output transformer secondaries linked by output connector to provide for 4 to 300 ohm loads. Damping factor 10. Total harmonic distortion: 0.1% at 1kHz at any level up to 50W output. Hum better than 80dB. Consumption: 24-150W depending on power output. Mains: 100-127V or 200-250V 50-60Hz. Size:  $12\frac{3}{4} \times 6\frac{1}{2} \times 4\frac{3}{4}$ in. Weight: 24lb. Price on application.

**Quad 303 power amplifier ★**

Transistorised stereo power amplifier. Output: 45W into 8 ohms. HD: 0.03% at 70Hz and 700 Hz, 0.1% at 10kHz. FR -1dB 30Hz-35kHz into 8 ohms, -1dB 20Hz-35kHz into 16 ohms. Noise level: -100dB. Sensitivity: 0.5V. Output impedance: 4-16 ohms. Output transistors: High voltage 2N3055. Mains. Designed for use with Quad 33 control unit but can be used with other high quality equipment. Size:  $4\frac{1}{2} \times 6\frac{1}{2} \times 12\frac{1}{2}$ in. Price: £55.

**■ RADFORD**

Radford Audio Ltd, Ashton Vale Road, Bristol, BS32HZ. Tel: Bristol 662301.

**SC-24 ★**

Stereo control unit. Transistors. Inputs: PU 2mV 50K, aux(1) 2mV 50K, aux(2) 80mV 100K, radio 80mV 100K, tape monitor 80mV 100K. Noise: (2mV inputs) -70dB; (80mV inputs) -75dB. Output: 1V RMS. Controls: balance, bass, middle, treble, input selector, filter 4, 7 and 10kHz at 12dB/octave. Designed for use with Radford SPA-50 amplifier but suitable for any power amplifier. AC mains. Size:  $4\frac{1}{2} \times 16\frac{1}{2} \times 9\frac{3}{4}$ in. Price: £80.

**SPA-50**

Stereo power amplifier. Transistors. Output: 50W RMS per channel. HD: 0.025% at rated output. FR: 10Hz-500kHz -3dB at 50W output. Noise: -95dB. Input: 1V RMS for rated output. Output impedance: 8 ohms. Mains: 110 120, 130, 220, 230, 240V AC. Size:  $10\frac{3}{4} \times 4\frac{1}{2} \times 12\frac{1}{2}$ in. Price: £85.

**PA-50**

Mono power amplifier. Transistors. Output: 50W RMS. HD: 0.025% at rated output. Noise: -95dB. Input: 1V RMS. FR: 10Hz-500kHz -3dB at 50W. Output impedance: 8 ohms.

Mains: 110, 120, 130, 220, 230, 240V AC. Size:  $4\frac{1}{2} \times 12\frac{1}{2} \times 8$ in. Price: £55.

### ■ RADON

Radon Industrial Electronics Co Ltd,  
Orme Road, Worthing, Sussex.  
Tel: Worthing 34904.

#### System 60

Integrated stereo transistor amplifier. Inputs: PU(1) 180mV, PU(2) 45mV, radio 150mV, aux 150mV. Output: 4W RMS per channel. Controls: bass, treble, volume, balance, selector, mode. HD: better than 0.2% at rated output. FR: 40Hz-20kHz. Noise: -60dB. Output impedance: 15 ohms. Mains: 240V AC. Price: £26.

#### System 500

Integrated stereo transistor amplifier. Inputs: mag PU 2.5mV RIAA equalised, ceramic PU 25mV RIAA equalised, radio 60mV, tape 60mV. Output: 10W RMS per channel. Controls: volume, balance, treble ( $\pm 12$ dB), bass ( $\pm 12$ dB), scratch filter, rumble filter (cut-off 50Hz). HD: 0.1% at rated output. Noise: -65dB. Output impedance: 8-15 ohms. Mains: 240V 50Hz. Price: £36.

### ■ REVOX

Distributors: C. E. Hammond & Co Ltd,  
Lamb House, Church Street, London, W4.  
Tel: 01-995 4551. Telex: 934047.

#### Revox A50 ★

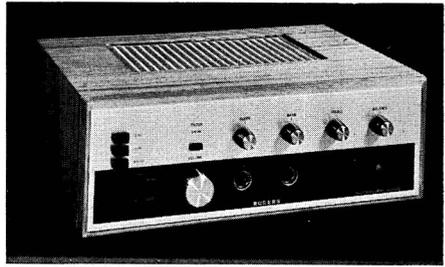
Stereo amplifier. Output: 40W RMS per channel into 4-8 ohms, 25W RMS per channel into 16 ohms. HD: less than 0.1% at 1kHz, 0.3% 40Hz-15kHz. FR: 20Hz-20kHz  $\pm 1$ dB. Inputs: mag 3mV, ceramic PU 230mV, tape 100mV, aux 100mV, radio 100mV, tape monitor 250mV. Treble control:  $\pm 12$ dB at 12kHz. Bass control  $\pm 12$ dB at 60Hz. Mains: 110, 130, 150, 220, 240, 250V 50/60 Hz. 30 silicon transistors, 3 rectifiers, 14 diodes. Size:  $6\frac{1}{4} \times 16\frac{3}{8} \times 9\frac{1}{8}$ in. Weight: 18lb. Price: £106.05.

### ■ RICHARDSON ELECTRONICS LTD

57 Jamestown Road, London, NW1.  
Tel: 01-267 0723.

#### SCP.2P

Stereo self-powered control unit. Modular construction with pluggable circuits. FET high Z input. Silicon semiconductors. Stabilised power supply. Low noise and distortion 0.01% for IV output. Bass  $\pm 20$ dB. Treble  $\pm 16$ dB. Rumble filter on disc. Quiet listening tape monitor. Mag pickup 2mV inputs (two): high Z 2Mohms 50mV; aux 250mV (two). Size:  $14\frac{3}{8} \times 14\frac{3}{8} \times 10\frac{1}{2}$ in. Psn 200-250V 50 or 60Hz. Price: £52.50 each case.



Rogers Ravensbourne

#### SIA.100 ★

Stereo integrated amplifier and control unit. Preamplifier specification as for SCP 2P. Power amplifier incorporates advance design complementary push-pull output to reduce crossover distortion. Output: 30W RMS per channel into 8 ohms. HD: 0.04%. Output protected against short circuit. Stable at all loads. Mains: 200-250V AC 50/60Hz. Price: £92.50 including teak case.

#### STA.200

Stereo transistor amplifier. Output: 100W RMS per channel into 8 ohms. 175W RMS per channel into 4 ohms. Mono version available giving balanced output of 50V into 8 ohms. Price: £150.

#### STA.100

Stereo transistor amplifier. Output: 50W RMS per channel into 8 ohms. 85W RMS per channel into 4 ohms. Price: £100.

#### SA170 Mk 2 and MA135 Mk 2

Valve power amplifiers. Full specification and prices on request.

### ■ ROGERS DEVELOPMENTS

#### (Electronics) LTD

4-14 Barmeston Road, Catford, London, SE6.  
Tel: 01-698 7424/4340. Cables: Rodevco,  
London, SE6.

#### Ravensbourne ★

Solid state stereo amplifier and control unit. Power output: 4, 8 and 16 ohms; 25W per channel RMS. HD: 0.1% average (0.06% at 15W). FR: 25Hz-25kHz  $\pm 1$ dB at 25W. Feedback: 36 dB. N/L: -80dB. Output transistors: 2N3055. Power consumption: quiescent 40W; at 25W +25W into 15 ohms 110W. Inputs: disc, sensitivity 4/8/100/200mV, impedance 50K, noise level -60/65dB; aux, radio and tape, sensitivity 200mV, impedance 100K, N/L: -75dB. Controls: push-button input selector, volume, bass and treble, balance, low pass filter and slope, function, headphone. Dimensions: case  $14\frac{3}{8} \times 10\frac{1}{4} \times 5\frac{1}{2}$ in; chassis  $13\frac{3}{8} \times 10\frac{1}{8} \times 4$ in. Price: (chassis) £59.50; (in cabinet) £64.

★ Indicates entry is illustrated

### Ravensbrook Mk II ★

Solid state stereo amplifier and control unit. Power output: 10W per channel into 15 ohms. 15W per channel into 8 ohms. HD less than 0.1% at 10W into 15 ohms. FR: 20Hz-50kHz -3dB. Noise level: disc -53dB, radio -8dB. Power consumption: quiescent 22W; 10W/15 ohms 50W. Inputs: disc, sensitivity 2/4/25/50 mV, impedance 47K, noise level: -53dB. Controls: push-button input selector, function, bass and treble, balance, high pass filter switch, low pass filter/slope. Dimensions: cabinet 14 $\frac{3}{8}$  × 9 $\frac{7}{8}$  × 5in; chassis 13 × 9 $\frac{3}{4}$  × 3 $\frac{1}{4}$ in. Price: (chassis) £47.50; (in cabinet) £52.50.

### ROTA

Distributors: Kelgrove (Sales) Ltd,  
25-31 Roman Road, London, E2.  
Tel: 01-980 7494/1936.

### OTL-1500

Integrated stereo amplifier. Inputs: crystal or ceramic PU 200mV, magnetic PU 5mV, tape, radio, aux 200mV. Controls: bass, treble, balance, volume, input selector. Output: 5W RMS per channel. Output impedance: 4-16 ohms. FR: 20Hz-20kHz ±1dB. Stereo headphone socket. Wood end pieces with simulated wood grain finish and dark control panel. Size: 12 × 3 $\frac{1}{2}$  × 8in. Price: £25.

### OTL-2200

Integrated stereo amplifier. Inputs: crystal or ceramic PU 200mV, magnetic PU 4mV, radio, microphone 5.5mV, tape 200mV. Controls: volume, treble, bass, input selector, slider balance adjustment. Output: 10W RMS per channel. Output impedance: 4-16 ohms. FR: 20Hz-40kHz ±1dB. Stereo headphone socket. Wood end pieces with simulated wood grain finish and dark control panel. Size: 14 × 4 × 9 $\frac{1}{2}$ in. Price: £34.75.

### ROTEL

Rank Audio Products, PO Box 70, Great West Road, Brentford, Middlesex.  
Tel: 01-568 9222. Telex: 24408.

### RA310 ★

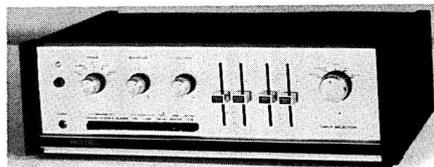
Integrated stereo amplifier. Inputs: magnetic PU 3mV, crystal PU 100mV, aux 200mV, tape 300mV. Noise level: -60dB on mag PU, -65dB on other inputs. Controls: +14dB -12dB at 50Hz, treble ±12dB at 10kHz, balance, volume, input selector with light indicators, pushbuttons for mode, on-off, loudness, speakers. Output: 20W RMS per channel into 4 ohms, 15W RMS per channel into 8 ohms. HD: 0.2% at rated output. FR: 20Hz-30kHz -1.5dB. Output impedance: 4, 8, 16 ohms. Mains: 100, 120, 200, 240V 50/60Hz. Size: 14 × 4 $\frac{1}{2}$  × 7 $\frac{1}{2}$ in. Price: £45.



Rogers Ravensbrook



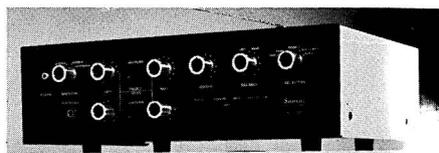
Rotel RA310



Rotel RA610



Sansui AU-222



Sansui AU-555



Sansui Q51

**RA610 ★**

Integrated stereo amplifier. Inputs: magnetic PU(1) 2.5mV 50K, magnetic PU(2) 2.5mV 100K, radio 120mV 25K, aux(1) 120mV 25K, aux(2) 120mV 25K, tape 620mV 35K, main amplifier 650mV 35K. Controls: loudness  $\pm 10$ dB at 5kHz, high filter  $-9$ dB at 10kHz, low filter  $-9$ dB at 50Hz, muting  $-20$ dB at 1kHz, bass  $+15$ dB  $-13$ dB at 50Hz, treble  $+14$ dB  $-16$ dB at 10kHz. Output: 32W RMS per channel into 8 ohms. HD:  $<0.1\%$  at rated output. FR: (main amplifier) 3Hz-100kHz  $-3$ dB, (aux inputs) 5Hz-90kHz  $-3$ dB. Output impedance: 4, 8, 16 ohms. Mains: 117, 240V AC. Size:  $16\frac{1}{4} \times 8\frac{3}{4} \times 4\frac{3}{8}$ in. Price: £69.

**■ SANSUI**

Vernitron Ltd,  
Thornhill, Southampton, SO9 5QF  
Tel: Southampton 44811.

**Sansui AU101**

Stereo integrated amplifier. Output: 15W per channel into 8 ohms. HD:  $<0.8\%$  at rated output. FR: 25Hz-40kHz. Separation: better than 45dB. Controls: mains on/off, balance, volume, bass, treble, input selector, tape monitor, loudness, speaker on-off. Sockets for headphones and microphone. Metal case with wooden end pieces. Price: £40.

**Sansui AU222 ★**

Solid state stereo amplifier. Power output: 18W per channel  $\pm 1$ dB at 8 ohms. HD: less than 0.8%. FR 20Hz-20kHz at 8 ohms. Damping factor: 20 at 8 ohms. H and N, volume at minimum,  $-80$ dB. Inputs: pickups 2mV (47K and 100K); tape head 1.5mV (200K); aux (two) 150mV (100K); tape monitor 150mV (40K). Psn 100, 117, 220 and 240V, 50 or 60Hz. Dimensions:  $4\frac{3}{8} \times 11\frac{1}{2} \times 10\frac{1}{2}$ in. Weight: 12.8lb. Price: £62.88.

**Sansui AU555A ★**

Solid state integrated stereo amplifier. Power output: 25W per channel  $\pm 1$ dB at 4 ohms. HD less than 0.5%. Distortion: less than 0.8%. FR 20Hz-30kHz. H and N: better than  $-100$ dB. Damping factor: 12 and 45 at 8 ohms. Inputs: pickup 2mV (47K and 100K); tape head 1.5mV 200K; aux 200mV (100K), mic 3.8mV (10K) and 140mV (100K); tape monitor 150mV (100K). Psn 100, 117, 220 and 240V, 50 or 60Hz. Dimensions:  $4\frac{3}{8} \times 15 \times 10\frac{3}{8}$ in. Weight: 17.4lb. Fitted in light walnut case. Price: £86.43.

**Sansui AU666**

Stereo integrated amplifier. Output: 35W per channel into 8 ohms. 45W per channel into 4 ohms. Inputs: pickup(2) 2mV 50K, mic 3mV 50K, radio 180mV 180K, aux 180mV 100K, tape monitor 180mV 100K. FR: 10Hz-40kHz  $\pm 1$ dB.

**Shure Solo-phone SA-2E****Shure M64-2E**

Separation: better than 60dB. Controls: bass, treble, mid-range, balance, volume, input selector, muting filter, speakers, loudness. Fitted into wooden case. Price: £109.47.

**Sansui AU999**

Stereo integrated amplifier. Output: 50W per channel into 8 ohms. HD:  $<0.4\%$  at rated output. Controls: three speaker controls, bass, treble, mid-range (all with over-ride), volume, balance, input selector, tuner filters. Price: £166.20.

**Sansui QS-1 ★**

Quadrosonic synthesizer for transforming two channel stereo into a live sound field. Fitted preamp for rear channel. Controls include volume, level set, front and rear balance, front balance, rear balance. Price: £88.81.

**■ SHURE ELECTRONICS LTD**

84 Blackfriars Road, London, SE1.  
Tel: 01-928 3424.

**Solophone SA-2E ★**

Provides personal stereo listening for one or two people. Gives sufficient amplification to accept output from any high quality cartridge (for example Shure Stereo Dynetic range), tape deck or FM tuner. There are input selector switch, separate volume controls for each channel and two headphone jacks mounted on the front panel. Size:  $10\frac{1}{4} \times 3\frac{1}{2} \times 3$ in. Weight: 2lb. Mains: 240V 50Hz. Price: £24.60.

**M64-2E ★**

Stereo preamplifier designed to furnish voltage gain and equalisation to enable amplifiers not equipped with necessary input facilities to be used with magnetic pickup cartridges and tape

★ Indicates entry is illustrated

heads. Can also be used for microphones and as buffer amplifiers. FR 20Hz-20kHz  $\pm 2$ dB. Input impedance; 50K at 1kHz. Load impedance: (high) 22K minimum; (low) 600 ohms optimum. Separation: 50dB at 1kHz. H and N: 71dB minimum below 10mV input from 20Hz-20kHz. Price:  $\pounds$ 19-20. Optional battery power unit: Price:  $\pounds$ 9.

### ■ SINCLAIR RADIONICS LTD

London Road, St Ives, Huntingdonshire, PE174HJ. Tel: St Ives (Hunts) 4311.

#### Stereo 60

Stereo preamplifier designed for Sinclair Project 60 range but suitable for other amplifiers. Inputs: mag PU 3mV, radio 3mV, ceramic PU 3mV, aux 3mV. Output: 250mV. SN: better than 70 dB. Channel matching: within 1dB. Treble control:  $\pm 15$ dB at 10kHz. Bass control:  $\pm 15$  dB at 100Hz. Silicon epitaxial planar transistors. Push-button input selection. Consumption: 5 mA. Finish: brushed aluminium panel with black knobs. Size:  $1\frac{1}{2} \times 8\frac{1}{4} \times 4$ in. Price:  $\pounds$ 9-98.

#### Active Filter Unit ★

Designed for Project 60 Series but suitable for other systems. For connection between a Stereo 60 preamplifier and two Z-30 or Z-50 power amplifiers. Two filter stages, one a rumble (high pass) filter the other a scratch (low pass) filter. Supply required: 15-35V at 3mA. Gain at 1kHz: 0.98 ( $-0.2$ dB). HF filter slope: 12dB/octave. LF filter slope: 12dB/octave. FR: 35Hz-20kHz  $-1$ dB. Finish: brushed aluminium panel with black knobs. Price:  $\pounds$ 5-98.

#### System 3000

Integrated stereo amplifier. Output: 17W RMS per channel. HD: less than 0.04% at full output at 1kHz, less than 0.1% at all power levels and all audio frequencies. Stabilised power supply. Full overload protection. Inputs: two pickup, radio, tape. Outlets for tape, headphones and AC mains. All silicon transistors. Finish: modern functional design in black anodised aluminium. Features include scratch filter and speaker muting switch. Price:  $\pounds$ 45.

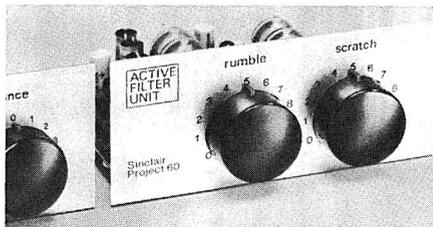
See Constructional Kits Section for details of Sinclair Radionics Z-30, Z-50, PZ-5, PZ-6 and PZ-8 modules.

### ■ SONY (UK) LTD

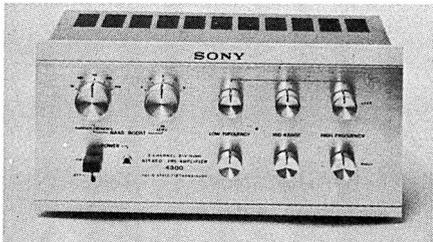
Pyrene House, Sunbury Cross, Sunbury-on-Thames, Middlesex. Tel: Sunbury 87644/7. Telex: 266371.

#### TA-4300 ★

Transistor 3-channel frequency divider. Stereo. Divides the audio signal into 3 frequency ranges for a 3-way amplifier/speaker system. 4-step selection of two crossover frequencies per chan-



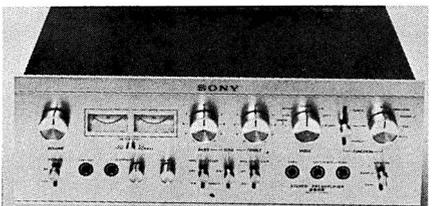
Sinclair Filter



Sony TA4300



Sony TA1144



Sony TA2000

nel. Controls: bass turnover, bass boost level, on/off, low frequency level (2), mid-range level (2), high frequency level (2). Output impedance:  $< 5$ K. Distortion:  $< 0.1\%$  at 3V output,  $< 0.5\%$  at 5V output (for signals within the passband). Mains: 100, 110, 220, 240V 50/60Hz. Size:  $5\frac{7}{8} \times 11\frac{5}{8} \times 6\frac{1}{2}$ in. Price:  $\pounds$ 72-50.

#### TA-1144 ★

Transistor stereo integrated amplifier. Inputs: PUI and PU2 1.2mV 47K (noise level better than 70dB), tuner and DIN socket 150mV 100K

(noise level better than 90dB), aux 1, 2 and 3 and tape 150mV 100K. Output: 30W per channel into 8 ohms. HD: less than 0.2%. Noise level: 90dB. Outlets: DIN socket 30mV 80K, tape outputs 150mV 10K. Controls: volume, loudness, balance, input selector, mode, independent right and left bass and treble, high filter, low filter, speaker switches. Mains: 100, 117, 220, 240V 50/60Hz. Dimensions: 16 $\frac{1}{8}$  × 12 $\frac{3}{8}$  × 5 $\frac{1}{2}$ in. Price: £94-75.

**TA-1010 ★**

Transistor stereo integrated amplifier. Inputs: PU1 and PU2 1.2mV 47K (noise level better than 70dB), tuner and aux 1, aux 2, tape and DIN socket 250mV 100K (noise level better than 90dB). Output: 15W per channel into 8 ohms. HD less than 0.5% at 1kHz. FR (+0, -2dB): 20Hz-60kHz. Outlets: record out 250mV 10K, DIN socket 36mV 80K. Controls: volume balance, loudness, mode, input selector, tape monitor, bass, treble, high filter (6dB per octave above 5kHz). Mains: 100, 117, 220, 240V 50/60Hz. Dimensions: 16 $\frac{1}{16}$  × 4 $\frac{7}{8}$  × 9 $\frac{3}{4}$ in. Price: £49-75.

**TA-2000**

Control preamplifier. Inputs: tape 1.2mV 500K, tuner 120mV 100K, phono 1.2mV 47K, tape 120mV 100K. Controls: bass (100Hz ± 10dB), treble (10kHz ± 10dB), high filter (12dB/oct. above 9kHz); low filter (12dB/oct. below 50Hz). Mains: 110, 117, 220, 240V 50/60Hz. Size: 15 $\frac{3}{4}$  × 5 $\frac{3}{4}$  × 12 $\frac{1}{4}$ in. Price: £129.

**★ STANDARD**

Telerenters (London and Provincial) Ltd, Standard House, 1-2 Church Way, Edgware, Middlesex. Tel: 01-952 7488/9. Telex: 24792.

**SR-158EE**

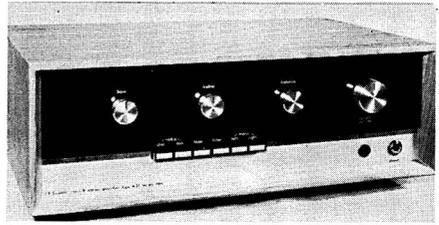
Integrated stereo amplifier. Output: 6W RMS per channel. HD: <0.5% at rated output. FR: 20Hz-30kHz at 8 ohms. S/N: (PU) 60dB, (aux) 70dB. Inputs: magnetic PU 1mV, crystal PU 200mV, radio 100mV, aux 50mV, tape recorder 500mV. Output impedance: 8 ohms. Size: 13 $\frac{1}{2}$  × 3 $\frac{3}{4}$  × 7 $\frac{1}{4}$ in. Mains: 230V 50/60Hz. Price: £34-09.

**■ STENTORIAN**

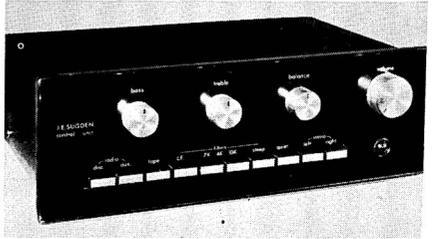
Whiteley Electrical Radio Co Ltd, Victoria Street, Mansfield, Notts. Tel: Mansfield 24763.

**Stereo 30**

Stereo integrated amplifier. Power output: 15W per channel RMS into 15 ohms. Inputs: tape (3-pin DIN socket) 100mV, 50K; microphone (2-pin jack socket) 15mV, 50K; crystal pickup, 100mV, 120K; magnetic pickup, 10mV, 50K; radio, 150mV, 50K. Output: tape (3-pin DIN



*J.E. Sugden A21*



*J.E. Sugden C51*

socket) 1V. FR 20Hz-20kHz ± 1dB. Distortion: less than 0.2% at 1kHz. Damping factor: 100. Hum: 50Hz -70dB; 100Hz -65dB. Noise: -65dB. Crosstalk: -65dB. Tone controls: bass (50Hz) + 11dB, -7dB. Treble (10kHz) + 10dB -13dB. Pushbutton selection, on/off, mono, stereo, reverse, microphone, tape, disc, radio. Price: (chassis) £73-70; (with teak veneer sleeve) £78-40.

**■ J. E. SUGDEN & CO LTD**

Bradford Road, Cleckheaton, Yorks. Tel: Cleckheaton 2501.

**A21 SERIES TWO ★**

Transistor stereo integrated amplifier with Class A output stages. Inputs: radio 150mV 200K; tape 150mV 200K; aux 150mV 200K. PU1, 2.5mV 68K; PU2, 50mV into special input circuit. Controls: bass ± 14dB at 40Hz; treble ± 14dB at 10kHz; treble filter 18dB/octave above 7kHz. Rumble filter 12dB/octave below 30Hz. Balance ± 6dB for 180 degree rotation. Channel balance maintained ± 1dB per channel. Pushbutton selection for input and operating mode. Power output: 12W RMS per channel into 8 ohms, at clipping level. HD 0.15% at 10W. FR: 20Hz-20kHz ± 1dB. S/N 80dB on radio, tape and aux, 70dB on disc. Outlet to recorder: 150mV. Size: 15 $\frac{1}{2}$  × 5 × 9in. Weight: 24lb. Price: £65.

**C51 control unit ★**

Transistorised stereo control unit designed for use with A51 power amplifier. Inputs: radio, tape and aux, each 150mV into 250K for flat

★ Indicates entry is illustrated

response. PU1 2.5mV 68K RIAA. PU2 same as PU1 or any characteristic to choice with basic sensitivity 0.25mV. Plug-in adaptors available for various cartridges, microphones, etc. Controls: bass  $\pm 16$ dB at 40Hz, treble  $\pm 12$ dB at 10kHz, volume  $\pm 1$ dB per channel, balance  $\pm 6$ dB for 180 degrees rotation. Rumble filter: 12dB/octave below 30Hz. Treble filter: 4kHz, 7kHz and 10kHz. Treble filter slope: gradual 6dB/octave, steep 18dB/octave, HD better than 0.1% at rated output. S/N better than 85dB on 150mV inputs, better than 75dB on PU2 input. Pushbutton selection of inputs and operating mode. Power: obtained from A51 amplifier. Size: 10  $\times$  4  $\times$  6in. Weight: 6lb 3oz. Price: £50.

#### A51 ★

Power amplifier with Class A output stages designed for use with C51 control unit. Transistors. Output 25W per channel into 15 ohms. HD at 20W better than 0.1%. FR: 30Hz-20kHz  $\pm 0.5$ dB. S/N 90dB 10K source. Sensitivity for 25W output: 600mV. Input impedance 200K. Size: 13  $\frac{1}{2}$   $\times$  8  $\frac{1}{2}$   $\times$  10in. Weight: 22lb. Price: £75.

### ■ TELEFUNKEN

Distributor: A. E. G. (Great Britain) Ltd, A. E. G. House, Chichester Rents, Chancery Lane, London, WC2.  
Tel: 01-242 9944. Cables: Allgem, London.

#### V201 ★

Stereo amplifier. 25W per channel into 4 ohms. HD less than 0.3% at 1kHz and 2  $\times$  25W. FR: ( $\pm 1.5$ dB) 20Hz-22kHz, ( $\pm 3$ dB) 17Hz-35kHz. Inputs: magnetic pickup, crystal pickup, tape, mic, radio. Outputs: speakers (4 ohms), earphones (100-400 ohms). Controls: volume, balance, bass, treble. Also 11 pushbuttons for flat response, rumble filter, noise filter, mono/stereo, stereo base width (extreme), PU1, PU2, tape, radio, on/off. Price: £93.45.

#### V250 ★

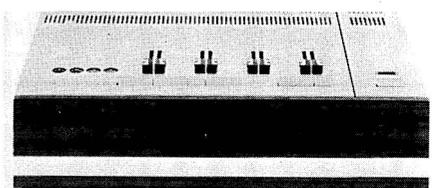
Stereo amplifier. 35W per channel (music power because of stabilised power supply) at 4 ohms. HD less than 0.2% at 1kHz and 2  $\times$  35W. FR: ( $\pm 1.5$ dB) 20Hz-18kHz, ( $\pm 3$ dB) 10Hz-20kHz. Cross-talk better than 52dB at 250Hz-10kHz. Inputs: magnetic pickup, 4.5mV 47K; crystal pickup, 300mV 470K; mic I and II, 1.5mV 47K; tuner, 300mV 470K; tape playback, 300mV 470K; tape record, 0.36mV/K. Outputs: speakers, 4 ohms; tape monitoring, 300mV 47K. Controls: slider stereo (both channels), volume, bass, treble, fade-in and fade-out (mixing). 11 pushbuttons for: mic, PU1, PU2, tuner, tape recorder, monitor, mono, rumble filter, noise filter, linear, on/off. Bass control gives  $\pm 16$ dB (50Hz), treble  $\pm 12$ dB (10kHz), rumble filter 25dB (15Hz) and 15dB (20Hz), noise filter 3dB (5.5kHz) and 20dB/octave above. Features in-



J.E. Sugden A51



Telefunken Hi-Fi V201



Telefunken Hi-Fi V250

clude electronic fuses, short-circuit protection, sockets for stereo recording, earphone socket with on/off speaker switching, three mains outlets. Price: £157.50.

### ■ TELETON

Teleton Electro (Distributors) Co Ltd, Teleton House, Robjohns Road, Widford, Chelmsford, Essex. Tel: 62442. Telex: 99338.

#### GA 101

Solid-state stereo amplifier matching GT 101 tuner. Output: more than 15W RMS per channel. Output impedance: 8 ohms. Inputs: magnetic PU 3mV, crystal PU 80mV, tape 250mV. Controls: input selection, volume, balance, loudness, mono/stereo, bass, treble, scratch filter, on/off. Mains: 110, 220/240V 50-60Hz. Dimensions: 12  $\frac{1}{2}$   $\times$  9  $\frac{3}{4}$   $\times$  4  $\frac{1}{2}$ in. Price: £37.50.

#### SAQ206

Solid-state stereo amplifier. Inputs: mag PU 3mV 50K, crystal PU 130mV 600K, aux 200mV 100K, tape 230mV 100K. Controls: loudness 13dB at 50Hz, 3dB at 10kHz; scratch filter

-6dB at 10kHz; bass +13dB -18dB at 100Hz; treble  $\pm 10$ dB at 10kHz; volume and balance. Output: 6W RMS per channel. HD: 1% at rated output. Intermodulation distortion: <1% 250Hz-8kHz. FR: 20Hz-20kHz. Output impedance: 8 ohms. Mains: 115, 230V AC. Size:  $15\frac{1}{2} \times 9 \times 3\frac{1}{2}$ in. Price: £32.50.

**TRIO**

Distributors: B. H. Morris & Co (Radio) Ltd, 84-88 Nelson Street, London, E1 2DY. Tel: 01-790 4824.

**KA2000A**

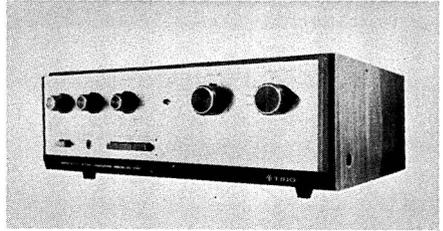
Integrated stereo amplifier. Inputs: magnetic PU 2mV 50K, aux (1) 130mV 50K, aux (2) 130mV 50K, radio 130mV 50K, tape 130mV 50K. Noise level: mag PU input -60dB, all other inputs -70dB. Controls: volume, bass, treble, input selector, loudness, tape monitor. Output: 16W RMS per channel. HD: <0.8% at rated output. FR: 20Hz-30kHz  $\pm 2$ dB. Output impedance: 4-16 ohms. Mains: 110-120V and 220-240V 50/60Hz. Size:  $10\frac{1}{4} \times 4\frac{1}{8} \times 9\frac{3}{8}$ in. Price: to be announced.

**KA2002 ★**

Integrated stereo amplifier. Inputs: magnetic PU(1) 2mV 50K, magnetic PU(2) 2mV 50K, radio 150mV 50K, aux 150mV 50K, tape 150mV 50K. Noise level: PU and radio inputs -60dB, aux and tape inputs -70dB. Controls: volume, bass, treble, balance, input selector, loudness. Output: 17W per channel RMS. HD: 0.8% at rated output. FR: 20Hz-30kHz  $\pm 2$ dB. Output impedance: 4-16 ohms. Mains: 110-120V and 220-240V 50/60Hz. Size:  $13 \times 4\frac{5}{8} \times 9\frac{1}{2}$ in. Price: £39.50.

**KA4000 ★**

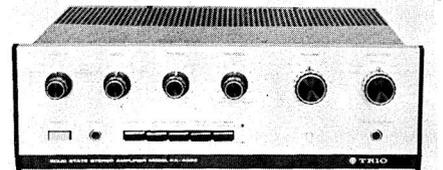
Solid state stereo amplifier. Power output: 41W per channel at 4 ohms, 32W per channel at 8 ohms. HD less than 0.5%. FR: main amp, 18Hz-50kHz  $\pm 1$ dB; high level input 20Hz-50kHz  $\pm 1$ dB. Sensitivity: pickups 1 and 2, 2mV; tape head, 2.3mV; mic, 2mV; aux, tuner, tape play, 200mV each; main amp input, 100mV. S/N ratio: pickups 65dB; tape head 63dB; mic 67dB; aux, tuner, tape play 77dB. Output impedance at speaker terminal: 0.29 ohm at 1kHz, 0.52 ohm at 50Hz, 0.29 ohm at 10K. Damping factor: 55 at 16 ohms load; 27.5 at 8 ohms load. Low filter: 80Hz cut-off, 12dB per octave. High filter, 8kHz cut-off, 12dB per octave. Bass control:  $\pm 10$ dB at 100Hz with 2dB step switch. Treble control:  $\pm 10$ dB at 10kHz with 2dB step switch. Outputs: two pairs speaker outputs (4-16 ohms); pre-amp outputs, headphone jack, low level mono output, tape recording outputs, DIN standard tape rec/play connector, switched and unswitched AC outlets. Controls: input selector switch, mode/tape monitor switch, output selector



Trio KA2002



Trio KA4000



Trio KA4002

switch, volume, balance, bass, treble, muting switch (-20dB), loudness contour switch, low and high filter switches. Power consumption: 13W quiescent, 180W at full power. Dimensions:  $5\frac{5}{8} \times 16\frac{5}{8} \times 11\frac{1}{2}$ in. Weight: 17.6lb. Price: £78.

**KA4002 ★**

Integrated stereo amplifier. Inputs: magnetic PU (1) 2.5mV 50K, magnetic PU (2) 2.5mV 50K, aux (1) 150mV 100K, aux (2) 150mV 100K, radio 150mV 100K, tape 150mV 100K. Noise level: magnetic PU input -60dB, all other inputs -70dB. Controls: volume, balance, treble, bass, input selector, loudness, filters, output switching. Output: 24W per channel RMS. HD: 0.5% at rated output. FR: 20Hz-40kHz  $\pm 1.5$ dB. Output impedance: 4-16 ohms. Mains: 110-120V and 220-240V 50/60Hz. Size:  $13 \times 4\frac{5}{8} \times 9\frac{1}{2}$ in. Price: £57.50.

**KA6000 ★**

Integrated stereo amplifier. Inputs: magnetic PU (1) 0.05mV 200 ohms, magnetic PU (2) 2mV 50K, radio 200mV 100K, aux 200mV 100K, microphone 2mV 100K, tape play 200mV 100K, tape head 2.3mV 100K. Noise level: PU1 -45

★ Indicates entry is illustrated

dB, PU2 -65dB, tuner and aux -77dB, mic -67dB, tape play -77dB, tape head -63dB. Controls: volume, balance, bass, treble, input selector, mono/stereo, loudness, filters, muting. Output: 58W per channel RMS. HD: 0.5% at rated output. FR: 20Hz-50kHz  $\pm$  1dB. Output impedance: 4-16 ohms. Mains: 110-120V and 220-240V 50/60Hz. Size: 16 $\frac{1}{4}$   $\times$  5 $\frac{1}{8}$   $\times$  1 in. Price: £97-50.

## ■ TRIPLETONE MANUFACTURING CO LTD

Factory No. 1, 138 Kingston Road, Wimbledon, London, SW19.  
Tel: 01-542 1189.

### Solid State FET Gemini Mk II ★

Integrated stereo transistor amplifier. Output: 5W RMS per channel into 3 ohms. HD <1% at rated output. Output impedance: 3-8 ohms. FR 30Hz-20kHz  $\pm$  2dB. Sensitivity: 80mV into 2 megohms, FET input (magnetic PU) 3.5mV into 47K, tape and radio inputs 80mV into 100K. H and N: better than -60dB on all inputs. Bass control:  $\pm$  15dB. Treble control  $\pm$  12dB. Middle control:  $\pm$  15dB. Available in chassis form or in teak case. Two versions offered, one with input for ceramic PU only, one with inputs for ceramic and magnetic PU. Prices: (chassis with dual PU input) £24.93; (teak case version with dual PU input) £28.50; (chassis with ceramic PU input) £19.93; (teak case version with ceramic PU input) £23.80.

### Solid State Stereo 800 Mk II ★

Integrated design with controls, preamplifiers and twin power amplifiers in one chassis. Inputs for gram, tape recorder and radio in mono or stereo. Controls for top cut, low-pass filter, treble, middle and bass. Output: 15W RMS per channel. HD: less than 0.2%. FR 30Hz-20kHz  $\pm$  1.5dB. Inputs: ceramic PU 80mV into 2 megohms, magnetic PU 3.5mV into 47K, tape recorder 80mV into 100K, radio 80mV into 100K. Tape outlet: 200mV into 100K  $\pm$  1dB 15Hz-30kHz. H and N: better than -60dB all inputs. Available in chassis form or in teak case. Two versions offered, one with input for ceramic PU only, one with inputs for ceramic and magnetic PU. Prices: (chassis with dual PU input) £36; (teak case version with dual PU input) £38.50; (chassis with ceramic PU input) £32.20; (teak case version with ceramic PU input) £34.90.

### Transistorised Preamplifier Series 3

Mono or stereo versions. Input to match magnetic cartridges. Gain 28dB. S/N: 70dB. Equalisation  $\pm$  2dB RIAA curve. Power required: 18V DC. Connection by octal plug, B9G connector or wander plugs. Size: 5 $\frac{1}{2}$   $\times$  2 $\frac{1}{2}$   $\times$  2 $\frac{1}{2}$  in. Prices: (mono) £3.88; (stereo) £5.50.



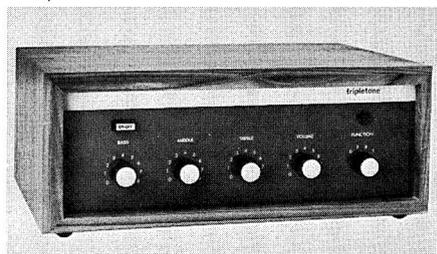
Trio KA-6000



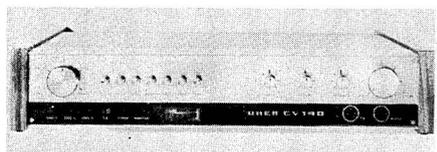
Tripletone Gemini Mk II



Tripletone Stereo 800 Mk II



Tripletone Hi-Fi Major Mk II



Uher CV140

**Hi-Fi Major Mk II ★**

Integrated transistorised mono amplifier. Inputs: magnetic PU 3.5mV 47K, ceramic PU 80mV 2 megohms, tape recorder 80mV 100K, radio 200mV 100K. Output: 15W RMS. HD <math>0.2\%</math> at rated output. FR 30Hz-20kHz  $\pm 1.5$ dB. Controls: bass  $\pm 18$ dB at 30Hz, middle  $+12$ dB to  $-15$ dB at 1kHz, treble  $\pm 18$ dB at 10kHz, volume, selector. Filter: 7kHz turnover, 6dB/octave. Output impedance: 8-15 ohms. H and N: better than  $-60$ dB all inputs. Tape outlet: 200mV 100K, 15Hz-30kHz  $\pm 1.5$ dB. Size: (chassis model)  $11 \times 7\frac{1}{2} \times 3\frac{3}{4}$ in; (cabinet model)  $13 \times 9 \times 5\frac{1}{2}$ in. Finish: sage green facia with white lettering, matching knobs with silver-coloured centres. Two versions offered, one with ceramic PU input only, one with inputs for ceramic and magnetic PU. Prices: (chassis with dual PU input) £23.50; (cabinet version with dual PU input) £25.88; (chassis with ceramic PU input) £19.93; (cabinet version with ceramic PU input) £23.50.

**■ UHER**

Distributors: Bosch Ltd, Rhodes Way, Radlett Road, Watford, Herts, WD24LB. Tel: Watford 44233.

**Uher CV140 ★**

Integrated power amplifier. Stereo transistorised. Inputs for radio, tape, PU, mic. Output: 35W RMS per channel into 4 ohms. FR 20Hz-20kHz  $\pm 1$ dB. Bass control:  $\pm 20$ dB at 20Hz. Treble control:  $\pm 20$ dB at 20kHz. Presence control:  $\pm 20$ dB at 7kHz. Scratch filter: 12dB per octave from 6.5kHz. Rumble filter: 6dB per octave from 100Hz. HD better than  $0.2\%$  at 1kHz. Input impedance: all 100K. Main chassis pressure casting with printed boards well supported. Easily accessible. Presets on front panel permit all inputs to be adjusted to a common level (indicated on meter on panel) before being passed to main amplifier. Six DIN input sockets provided, three have facilities for plug-in pre-amplifier modules for low impedance mic, magnetic or ceramic PUs. Mains: 100/130V or 200/240V, 50 or 60Hz. Consumption: 160W at full output. Price: £166. Plug-in preamplifier modules available extra. Price: £5-70.

**■ VORTEXION LTD**

257/263 The Broadway, Wimbledon, London, SW19. Tel: 01-542 6242/3/4 and 2814. Cables: Vortexion, London, SW19.

**CP50 Amplifier**

AC mains and 12-volt. The CP50 is an all silicon transistor amplifier for mains and 12-volt battery use, with 8 $\Omega$ -15 $\Omega$  and 100-volt line output. The amplifier itself has overload or short circuit protection and all inputs have reasonable overload

protection. Very large heat sinks are used with good ventilation and it is quite cool running on speech or music peaking 50 watts and even with over 40 watts of continuous sine wave the temperature conditions are not exceeded. The reservoir capacitor has been divided into 4 parts, each fused. The frequency response is within 3dB from 25Hz to 20kHz and bass and treble controls are fitted, of 26dB sweep each. This is housed in our durable steel case. Size:  $18 \times 6 \times 11\frac{1}{2}$ in. Battery consumption 3 amps. Weight: 35lb. Prices: 1 PU and 2 low Mic inputs £102, 1 PU and 3 low Mic inputs £110, 4 low Mic inputs £115.

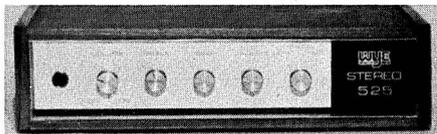
**All Silicon Mixer Amplifier 20/30 Watt ★**

This is a high fidelity 'minimised' distortion transistor amplifier made possible by the latest types of silicon transistors. Since it gives 20 watts at 0.1% harmonic and 0.2% intermodulation distortion and less than 3 times this at 30 watts on 7 $\frac{1}{2}\Omega$  it is suitable for high quality P.A. or High Fidelity use. No output transformer is fitted in this instance, but full overload protection is provided for this cool running amplifier which is suitable for continuous night and day operation and has a quiescent consumption of less than 4 watts from the mains. In the event of overload the output is instantly switched off until it ceases without blowing any fuses, the circuit operates far faster than any fuse. The response is within 1dB from 20Hz-20kHz and feedback bass and treble controls have a total range of 24-26dB each. It can be supplied for balanced line low impedance microphone (or high impedance at reduced prices) and the normal aux or gram at 50mV into 100K. Price: £35.

**100 Watt All Silicon Amplifier**

This is a high-fidelity amplifier for audio frequencies featuring a new principle protection circuit, which is automatic on output overload, far faster than any fuse, and of course resetting when the signal is reduced. In addition a thermal cut-out is fitted which automatically switches off should it be possible for any reason to take the heat sinks beyond the safe limits. The large heat sinks are funnel cooled to aid efficiency, and when supplying 100 watts power at low to medium frequencies the output transistors only have to dissipate some 18 watts each and they are capable of over 100 watts each. These transistors also have a voltage rating double that required. Large output transistors are not satisfactory above 20kHz, and since it is not required for audio purposes, the overload limits the power capacity to the safe power available at high frequencies. The response is level from 20Hz to 15kHz and 3dB maximum down at 20kHz. Outputs are for 8-15 ohms and 100-volt line. Harmonic distortion does not tell the whole

★ Indicates entry is illustrated



Wye Electronics Stereo 525

story with transistor amplifiers, so in this case only the intermodulation distortion is given which is less than 0.5%. The input required is less than 0.5 volt on 100K $\Omega$ . Price: £80.

#### 200 Watt Amplifier

Can deliver its full audio power at any frequency in the range of 30Hz-20kHz  $\pm$ 1dB. Less than 0.2% distortion at 1kHz. Can be used to drive mechanical devices for which power is over 120 watt on continuous sine wave. Input 1mW  $\phi$  600 $\Omega$ . Psn: 100-120V or 200-240V. Additional matching transformers for other impedances are available. Price: £135.

#### 4C/FET/100W

Mono mains amplifier with four input channels. Inputs: 30/60 ohms balanced line standard, 200 ohms and 600 ohms to order. Controls: separate gain control for each input, common bass and treble. Tone controls give approximately 12dB lift and 12dB cut. All silicon transistors with FET input stages. Output: 100W RMS. FR: level 30Hz-15kHz, -3dB (maximum) at 20kHz. Output impedance: 100V at 100 ohms (other impedances to order). Stove enameled case. Size: 18  $\times$  6  $\times$  11 $\frac{1}{2}$ in. Weight: 37lb. Price: £115.

See Tape Amplifier and Mixer Units section for details of Vortexion mixer/amplifiers.

### ■ WHITELEY ELECTRICAL

See Stentorian.

### ■ WYE ELECTRONICS LTD

Queen Street North, Whittington Moor,  
Chesterfield, Derbyshire.  
Tel: Chesterfield 51116.

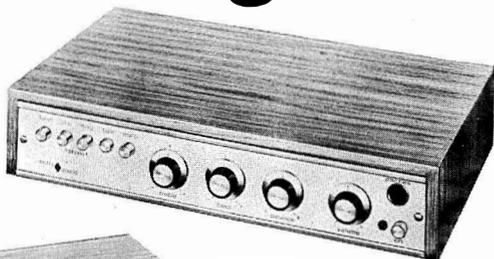
#### Stereo 525 ★

Transistorised integrated stereo amplifier. Inputs: PU 50mV 1 megohm, radio 30mV 1 megohm, tape 30mV 1 megohm. Controls: treble +11dB -16dB at 10kHz, bass +8dB -12dB at 100Hz, volume, balance, function selector. Output: 10W RMS per channel into 4 ohms: HD: 1.5% at 1kHz 10W into 4 ohms. FR: 40Hz-18kHz  $\pm$  3dB. Finish: veneered shelf-mounting cabinet with satin metal panel. Price: £30.

# Choose your Hi-Fi from the Metrosound range.

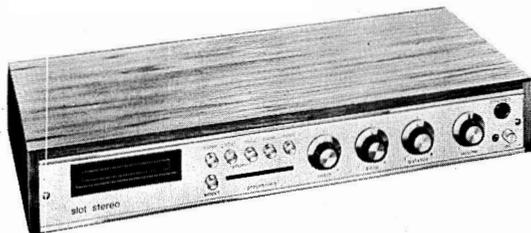
## ST20E STEREO AMPLIFIER

10 watts rms per channel.  
Frequency response 30Hz to  
30KHz. Inputs for Magnetic and  
crystal phono, tuner and tape.  
Stereo headphone socket.



## SS30E COMBINED STEREO AMPLIFIER & CARTRIDGE PLAYER

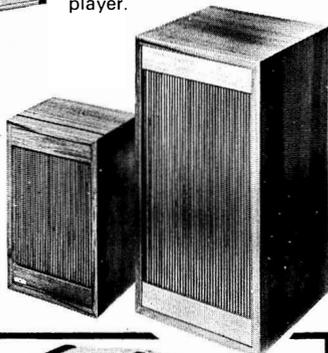
Same features as ST20E  
plus 8-track stereo cartridge  
player.



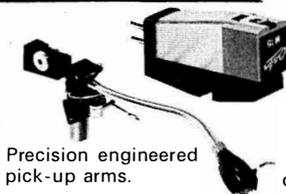
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**SPECIFICATIONS:** 7 watts per channel RMS (12 watts per channel peak music power). Frequency response 35-20,000Hz. Facilities for headphones, tape recorder, Tuner, Magnetic, Ceramic and crystal cartridge inputs. Transistorised. Size 16½" x 7" x 3¾". Manufacturers full Guarantee.

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ARMSTRONG 526 .....	£104.71	£87.75
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A/TECHNICA AT1005 arm .....	£19.45	£16.25
B/S/R M800P/C wired .....	£225.55	£21.75
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B & W DM3 each .....	£63.00	£50.00
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ROGERS R/BROOK (cased) .....	£64.00	£51.00
ROGERS R/BROOK Tuner .....	£66.89	£56.00
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ROTEL 120ST .....	£40.39	£41.00
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SANSUI SS2 H'phones .....	£7.73	£6.25
SANSUI AU222 .....	£62.88	£50.00
SANSUI AU555A .....	£86.43	£69.50
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TANDBERG 1841X .....	£69.75	£59.00
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TANNOY 12 LANCASTER .....	£56.25	£46.50
TANNOY 15 LANCASTER .....	£63.25	£52.00
THORENS TD150AB/TX11 .....	£55.93	£45.75
THORENS TD125 Motor .....	£79.04	£66.50
TRANSCRIPTOR SATURN .....	£57.60	£49.50
W/DALE SUPER LINTONS (pr) .....	£49.90	£41.50
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# Three different names, but they all sound great.

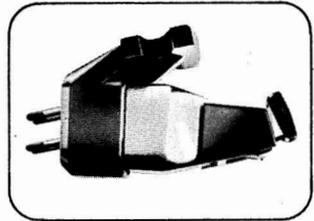


## AKAI

The Akai 4000D tape deck – the best selling tape deck in Britain. Probably because it's the best tape deck in Britain. Its outstanding features include 3 heads for off-the-tape monitoring plus sound-on-sound recording. Just one model from the top quality Akai range.

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## Akai, Rotel, Empire



For further information on any or all of these three great-sounding names. Contact Rank Audio Products, PO Box 70 Great West Road, Brentford, Middlesex. Telephone 01-568 9222

# Directory of Tape Recorders

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ AKAI

UK distributors: Rank Audio Products,  
PO Box 70, Great West Road, Brentford,  
Middx. Tel: 01-568 9222. Telex: 24408.

### M.10L

Stereo  $\frac{1}{4}$ -track recorder. Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$ ,  $7\frac{1}{2}$ /s. Max spool: 7in. W and F:  $7\frac{1}{2}$ /s 0.1%,  $3\frac{3}{4}$ /s 0.2%,  $1\frac{7}{8}$ /s 0.3%. FR:  $7\frac{1}{2}$ /s 30Hz-25kHz  $\pm$  3dB,  $3\frac{3}{4}$ /s 30Hz-18kHz  $\pm$  3dB,  $1\frac{7}{8}$ /s 40Hz-9kHz  $\pm$  3dB. Replay char: NARTB. Rewind time: 90 seconds for 1,200ft. Two VU meters. Inputs: line 50mV 175K, mic 0.5mV 4.7K, DIN (high) 50mV 150K, DIN (low) 5mV 27K. Outlets: line 1-23V 100 ohms, DIN 0.4V 10K, headphones 8 ohms. Output: 8W RMS per channel. Transistors. Own deck. One 3-speed hysteresis motor, two outer rotor motors. Size:  $14 \times 14 \times 8\frac{3}{8}$ in. Input mixing. Crossfield head. Manual reverse. Two headphone sockets. Price: £196 (plus £49.05 PT).

### X-1800SD ★

Stereo tape recorder.  $\frac{1}{4}$ -track. Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$ ,  $7\frac{1}{2}$  and 15i/s with adaptor. Max spool capacity: 7in. W and F  $7\frac{1}{2}$ /s 0.12%;  $3\frac{3}{4}$ /s 0.15%;  $1\frac{7}{8}$ /s 0.2%; cartridge 0.25%. FR  $7\frac{1}{2}$ /s 30-23kHz  $\pm$  3dB;  $3\frac{3}{4}$ /s 30Hz-18kHz  $\pm$  3dB;  $1\frac{7}{8}$ /s 30Hz-9kHz  $\pm$  3dB; cartridge 50Hz-17kHz  $\pm$  3dB. H and N -50dB. Replay char: NARTB. Level indicator: VU meter. Rewind time: 1,200ft 150 sec. Inputs: microphone 0.5mV, 50K; line, 60mV. Outlets: line and headphone. Audio output: 4W per channel RMS. Speakers: two 4in. Transistorised. Motor: 2-speed induction. Tape deck: own. Dimensions:  $15 \times 13\frac{1}{2} \times 9\frac{1}{2}$ in. Weight: 37.4lb. Pause. Position indicator: digit. Straight through amplifier. Monitoring. Input mixing. Record and replay facilities for 8-track cartridges in addition to reel-to-reel. Reel to cartridge transfer. FM multiplex ready. Crossfield head. Walnut cabinet. Psn 100-240V, 50 or 60Hz. Price: £159.50 (plus £39.92 PT).

### X-V ★

Stereo mains/battery tape recorder.  $\frac{1}{4}$ -track. Speeds:  $1\frac{7}{8}$ ,  $1\frac{7}{8}$ ,  $3\frac{3}{4}$  and  $7\frac{1}{2}$ /s. Max spool capa-

city: 5in (7in with extension arms). W and F  $7\frac{1}{2}$ /s 0.15%;  $3\frac{3}{4}$ /s 0.17%;  $1\frac{7}{8}$ /s 0.25%;  $1\frac{7}{8}$ /s 0.35%. H and N DC -50dB; AC -45dB. FR  $7\frac{1}{2}$ /s 40Hz-20kHz  $\pm$  3dB;  $3\frac{3}{4}$ /s 40Hz-17kHz  $\pm$  3dB;  $1\frac{7}{8}$ /s 30Hz-11kHz  $\pm$  3dB;  $1\frac{7}{8}$ /s 30Hz-5kHz  $\pm$  3dB. Replay char: NARTB. Level indicator: meter. Rewind time: 600ft 90 sec. Inputs: microphone, 0.1mV, 600 ohms; line 60mV, 250K; DIN. Outlets: line and earphone. Audio output: 1W per channel RMS. Speakers: two 3in. Transistorised. Motor: brushless DC micro. Tape deck: own. Dimensions:  $5\frac{1}{2} \times 11 \times 12$ in. Weight: 12.1lb. Position indicator: digit. Monitoring by earphone. Crossfield head. Stereo record/playback. Psn 100-240V or DC battery. Price: £150 (plus £37.54 PT).

### X-4000

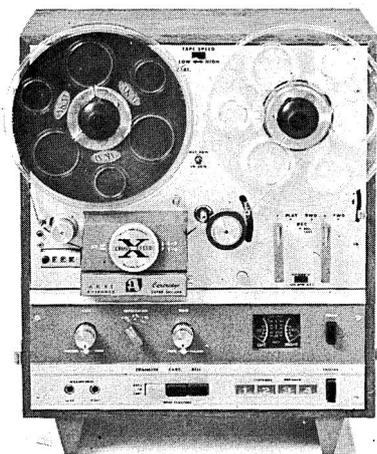
Stereo  $\frac{1}{4}$ -track recorder. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ /s. Max spool: 7in. W and F:  $7\frac{1}{2}$ /s 0.15%,  $3\frac{3}{4}$ /s 0.2%. H and N: -50dB. FR:  $7\frac{1}{2}$ /s 30Hz-22kHz  $\pm$  3dB,  $3\frac{3}{4}$ /s 30Hz-16kHz  $\pm$  3dB. Replay char: NARTB. Rewind time: 180 seconds for 1,200ft. Two VU meters. Inputs: mic 0.5mV 30K, line 50mV 330K, DIN 20mV 100K. Outlets: line 1-228V 1.5K, DIN 250mV 600 ohms, headphones 8 ohms. Output: 7W RMS per channel. Speakers: two 6  $\times$  4in. Transistors. One motor. Own deck. Size:  $12\frac{3}{8} \times 15\frac{7}{8} \times 7\frac{1}{2}$ in. Weight: 26 $\frac{1}{2}$ lb. Monitoring. Input mixing. One micron head gaps. Mains: 100-240V AC 50-60 Hz. Price: £99.90 (plus £25 PT).

### X-5000 (L and W) ★

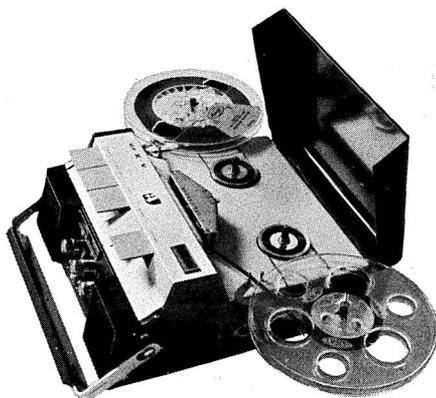
Stereo  $\frac{1}{4}$ -track recorder. Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$ ,  $7\frac{1}{2}$ /s, 15i/s optional. Max spool 7in. W and F:  $7\frac{1}{2}$ /s 0.12%,  $3\frac{3}{4}$ /s 0.16%,  $1\frac{7}{8}$ /s 0.22%. H and N: -50dB. FR:  $7\frac{1}{2}$ /s 35Hz-24kHz  $\pm$  3dB,  $3\frac{3}{4}$ /s 40Hz-16kHz  $\pm$  3dB,  $1\frac{7}{8}$ /s 45Hz-7.5kHz  $\pm$  3dB. Replay char: NARTB. Rewind time: 90 seconds for 1,200ft. Two VU meters. Inputs: mic 0.5mV 4.7K, line 50mV 175K, DIN 5mV 27K. Output: 4W RMS per channel. Speakers: two 7  $\times$  5in. Transistors. Own deck. One hysteresis synchronous 2-speed motor. Size:  $14 \times 13\frac{1}{2} \times 9\frac{1}{2}$ in. Weight: (X-5000L) 32lb; (X-5000W) 31lb. Pause control. Monitoring. Crossfield head. Auto shut off. Integrated circuits. Mains: 100-240V 50/60 Hz. Price: £142.35 (plus £35.62 PT).

### CR80 ★

Stereo cartridge recorder less speakers. Eight-track. Speeds:  $3\frac{3}{4}$ /s. W and F: 0.25%. H and N: -47dB. FR: 50Hz-16kHz  $\pm$  3dB. Replay char: NARTB. Fast forward wind: 230 seconds for 300ft. Two VU meters. Inputs: mic 0.5mV, line 50mV. Outlet sockets for line, headphones, external speakers. Output: 8W RMS per channel. Own tape transport. Headphone monitoring. Size:  $13\frac{1}{2} \times 5\frac{1}{2} \times 10$ in. Weight: 19 $\frac{1}{2}$ lb. One micron gap head. Mains: 100-240V 50/60Hz. Price: £92 (plus £23 PT).



Akai X-1800SD



Akai X-V



Akai X5000W

**CS50 ★**

Stereo cassette recorder less speakers.  $\frac{1}{4}$ -track. Compact cassette. Speed:  $1\frac{7}{8}$ i/s. W and F: 0.2% H and N: -45dB. FR: 30Hz-16kHz. Replay char: NARTB. Rewind time: 75 seconds for C60 cassette. Two VU meters. Inputs: mic 0.2mV 4.7K, DIN 3mV 25K, line 220K. Outlets: line 1.3V 10K, DIN 0.4V, headphones 8 ohms. Output: 6W RMS per channel. Own tape transport. Outer rotor motor. Size:  $15 \times 6\frac{1}{4} \times 11\frac{1}{4}$ in. Weight:  $16\frac{3}{4}$ lb. Pause control. Headphone monitoring. Invert-o-matic automatically withdraws tape cassette, reverses and replaces. Automatic shut-off. Mains: 100-240V 50/60Hz. Price: £104.65 (plus £26.19 PT).

**1720L ★**

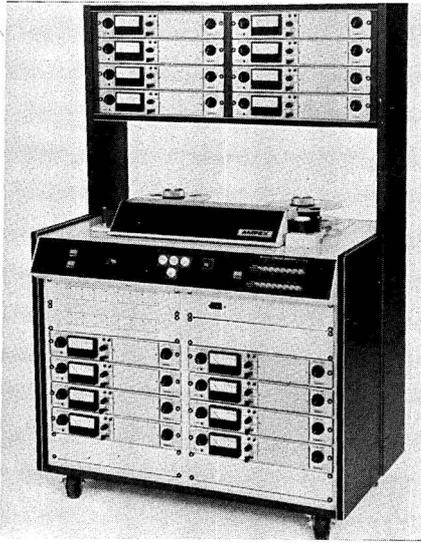
Three-speed  $\frac{1}{4}$ -track stereo recorder. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool: 7in. W and F:  $7\frac{1}{2}$ i/s 0.18%,  $3\frac{3}{4}$ i/s 0.25%,  $1\frac{7}{8}$ i/s 0.35%, H and N: -50dB all speeds. FR:  $7\frac{1}{2}$ i/s 40Hz-15kHz  $\pm 3$ dB,  $3\frac{3}{4}$ i/s 40Hz-12kHz  $\pm 3$ dB,  $1\frac{7}{8}$ i/s 40Hz-6kHz  $\pm 3$ dB. Replay char: NARTB. Rewind time:  $2\frac{1}{2}$  minutes for 1,200ft. Meter level indicator. Inputs: mic 3.5mV 20K, line 30mV 150K, DIN 10mV 50K. Outlets: line 1.2V (0 VU) 82K, DIN 2.5V, stereo phones 150mV 8 ohms. Output: 3W RMS per channel. Speakers: (2)  $7 \times 5$ in. Own deck. One two-speed motor. Pause. Monitoring. Input mixing. Size:  $14\frac{1}{4} \times 14\frac{3}{8} \times 9\frac{5}{8}$ in. Weight: 30lb. Mains: 100-240V AC 50/60Hz. Price: £77.75 (plus £19.46 PT).

**GX365**

Three-speed  $\frac{1}{4}$ -track stereo tape recorder. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool: 7in. W and F:  $7\frac{1}{2}$ i/s 0.04%,  $3\frac{3}{4}$ i/s 0.07%,  $1\frac{7}{8}$ i/s 0.14%. H and N:  $7\frac{1}{2}$ i/s -55dB,  $3\frac{3}{4}$  and  $1\frac{7}{8}$ i/s -50dB. FR:  $7\frac{1}{2}$ i/s 30Hz-28kHz  $\pm 3$ dB,  $3\frac{3}{4}$ i/s 30Hz-23kHz  $\pm 3$ dB,  $1\frac{7}{8}$ i/s 40Hz-12kHz  $\pm 3$ dB. Replay char: NARTB. Rewind time:  $1\frac{1}{4}$  minutes for 1,200ft. VU meter. Inputs: mic 0.7mV 10K, line 70mV 150K, DIN (low) 7mV 16K, DIN (high) 70mV 150K. Outlets: line 1.23V (0 VU) 100 ohms, DIN 0.4V, stereo phones 30-40mV 8 ohms. Output: 15W RMS per channel. Speakers:  $4 \times 2$ in monitoring. Three motors (one three-speed 2-4-8 pole, two 6-pole outer rotor). Own deck. Superimpose. Pause. Straight-through amplifier. Monitoring (A-B and headphones). Input mixing. Glass crystal ferrite heads. Auto reverse. Remote control. Magnetic braking. Size:  $16\frac{1}{4} \times 18\frac{1}{2} \times 11\frac{1}{8}$ in. Weight: 61lb. Mains: 100-240V 50/60Hz. Price: £305.55 (plus £76.45 PT).

**X2000SD**

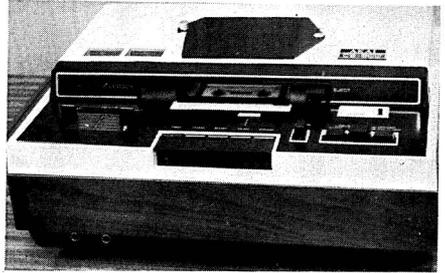
Three-speed stereo recorder with facilities for cassettes, cartridges and reel-to-reel recording and playback. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool 7in. W and F:  $7\frac{1}{2}$ i/s 0.09%,  $3\frac{3}{4}$ i/s 0.14%,  $1\frac{7}{8}$ i/s 0.20%. H and N: reel-to-reel all speeds 50dB, cassettes and cartridges 45dB. FR:  $7\frac{1}{2}$ i/s 30Hz-



Ampex MM1000



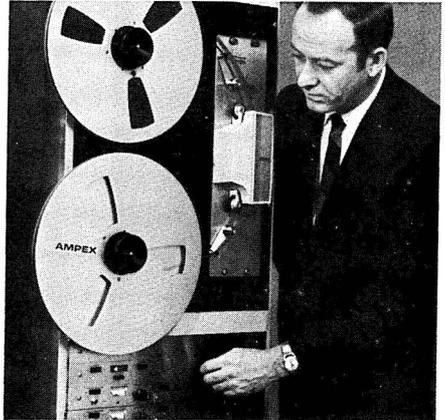
Akai CR80



Akai CS50



Akai 1720L



Ampex ABR15

23kHz  $\pm$  3dB, 3 $\frac{3}{4}$ i/s 30Hz-18kHz  $\pm$  3dB, 1 $\frac{7}{8}$ i/s 30Hz-9kHz  $\pm$  3dB, cassettes 30Hz-16kHz  $\pm$  3dB, cartridges 30Hz-18kHz  $\pm$  3dB. Replay char: NARTB. Rewind time: 2 $\frac{1}{2}$  minutes for 1,200ft, 80 seconds for cassette. VU meters. Inputs: mic 0.15mV, line 25mV. Outlet: line. Output: 8W RMS per channel. Speakers: 4  $\times$  2in monitoring. Two-speed capacitor motor. Own deck. Cross-field head. Monitoring. Transfer facilities from reel to cassette or cartridge. Size: 10 $\frac{5}{8}$   $\times$  13 $\frac{3}{4}$   $\times$  18 $\frac{3}{8}$ in. Weight: 49 $\frac{1}{2}$ lb. Mains: 100-240V 50/60Hz. Price: £239.95 (plus £60.05 PT).

**AMPEX (GB) LTD**

Acre Road, Reading, Berks, RG2 0QR.  
Tel: Reading 84411.

**ABR15, MM1000 ★**

Full range of professional and semi-professional tape decks, tape units and complete recorders. Typical specification includes following facilities. Full-, half- or quarter track on  $\frac{1}{2}$ in tape. Up to 15in spools. Speeds: selectable pairs from  $\frac{1}{8}$ ,  $\frac{1}{7}$ , 3 $\frac{3}{4}$ , 7 $\frac{1}{2}$ , 15. Unidirectional or bi-directional operation. FR: 15i/s 30Hz-18kHz  $\pm$  3dB, 1 $\frac{7}{8}$ i/s 40Hz-10kHz. Crosstalk rejection: better than 60dB at 1kHz. Bias/erase frequency: 100 kHz. W and F: 15i/s 0.1%, 1 $\frac{7}{8}$ i/s 0.25%. Start time: operating speed obtained in 0.1 second or less. Stop time: at 15i/s tape moves 3in. S/N: 15i/s half-track 63dB, 7 $\frac{1}{2}$ i/s half-track 63dB, 3 $\frac{3}{4}$ i/s half-track 58dB.

Supplied to professional and scientific orders

★ Indicates entry is illustrated

only free of tax. Further details of models and specifications on request.

## ■ BANG & OLUFSEN UK LTD

Eastbrook Road, Gloucester, GL47DE.  
Tel: Gloucester 21591.

### Beocord 1600

Stereo tape recorder less speakers.  $\frac{1}{4}$ -track. Speeds:  $3\frac{3}{4}$  and  $7\frac{1}{2}$ i/s. Max spool 7in. W and F:  $3\frac{3}{4}$ i/s  $\pm 0.2\%$ ,  $7\frac{1}{2}$ i/s  $\pm 0.15\%$ . H and N:  $3\frac{3}{4}$  i/s  $> -50$ dB,  $7\frac{1}{2}$ i/s  $> -50$ dB. FR: (DIN 45-500 spec)  $3\frac{3}{4}$ i/s 40Hz-16kHz,  $7\frac{1}{2}$ i/s 30Hz-20kHz. Replay char. DIN. Rewind time: 3 min 20 secs for 1,800ft. VU meter level indicator. Inputs: mic(2) 80 $\mu$ V 50-200 ohms, radio 2.5mV 47K, PU 60mV 470K. Outlets: line 1V 25K, phones 6V max 100 ohms, speakers (2) 4 ohms. Output: 10W RMS per channel. Transistors. Own deck. Papst outer rotor motor. Superimpose. Pause control. Straight-through amplifier. Monitoring (A only). Input mixing (limited). Parallel track replay. Photo-electric stop. Electronic speed change and mode switching. Horizontal or vertical operation. Can be wall-mounted. Size:  $17\frac{1}{2} \times 5\frac{3}{4} \times 13$ in. Weight: 26lb. Mains: 110, 130, 220, 240V AC 50Hz. Finish: teak or rosewood. Price: (teak) £139.50 (including PT); (rosewood) £140.50 (including PT).

## ■ BRENELL ENGINEERING CO LTD

231-5 Liverpool Road, London, N1.  
Tel: 01-607 8271 (5 lines).

### Mk 5. Type M. Series 3 ★

Speeds: 15,  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Three motors.  $8\frac{1}{2}$ in spools. FR 15i/s, 40Hz-20kHz;  $7\frac{1}{2}$ i/s, 40Hz-18kHz;  $3\frac{3}{4}$ i/s, 40Hz-13kHz;  $1\frac{7}{8}$ i/s, 40Hz-6kHz. Level meter. H and N -45dB. W and F  $1\frac{7}{8}$ i/s,  $< 0.25\%$ ;  $3\frac{3}{4}$ i/s,  $< 0.15\%$ ;  $7\frac{1}{2}$ i/s,  $< 0.1\%$ , 15i/s,  $< 0.05\%$ . Outlet from pre-amp. Mixing. Superimposing. Tape monitoring. Input monitoring. Size:  $18 \times 18 \times 9$ in. Weight: 40lb. Price: £116.45 (plus £29.14 PT).

### Mk 5. Series 3

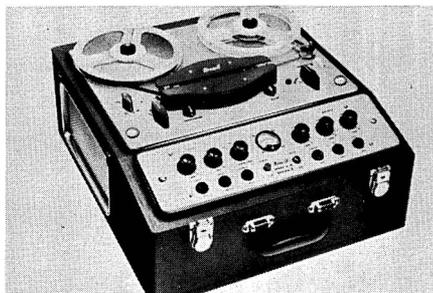
15,  $7\frac{1}{2}$ ,  $3\frac{3}{4}$  and  $1\frac{7}{8}$ i/s. Three motors,  $8\frac{1}{2}$ in spools. FR 15i/s, 40Hz-15kHz  $\pm 2$ dB;  $7\frac{1}{2}$ i/s, 40Hz-14kHz;  $3\frac{3}{4}$ i/s, 40Hz-11kHz;  $1\frac{7}{8}$ i/s, 40Hz-6kHz  $\pm 3$ dB. ME level ind (Meter available). H and N -45dB. W and F 0.05% at 15i/s. Hi-fi outlet 500mV into 47K. Straight-through amp. Switched frequency correction. Pause control and monitoring. Size:  $18 \times 18 \times 8$ in. Weight: 38lb. Price: £93.40 (plus £23.38PT); (with meter) £99.49 (plus £24.90 PT).

### STB2

Stereo/mono recorder. See Tape Units.

### ST200 ★

Transistorised tape recorder for general-purpose



Brenell Mk 5 Series 3 type M



Brenell ST200/ST400

(mains) use. Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$  and  $7\frac{1}{2}$ i/s. 2-track. Stereo. W and F  $7\frac{1}{2}$  0.08%,  $3\frac{3}{4}$  0.1%,  $1\frac{7}{8}$  0.12%. H and N  $7\frac{1}{2}$ -59dB,  $3\frac{3}{4}$ -56dB,  $1\frac{7}{8}$ -53dB. FR  $7\frac{1}{2}$  40Hz-14kHz,  $3\frac{3}{4}$  40Hz-11kHz,  $1\frac{7}{8}$  40Hz-5kHz, each  $\pm 2$ dB. CCIR. Two meters. Rewind time: 1,200ft 60 secs. Inputs: microphone, 50 $\mu$ V, 200 ohms; radio 40mV, 220K. Outlets: hi-fi 200mV into 47K; monitor 2V, 100 ohms; extension speaker 6W RMS, 15 ohms. Output: 6W RMS. Speaker:  $3\frac{1}{2}$ in. Three Papst motors. Own tape deck. Dimensions:  $15\frac{1}{2} \times 17\frac{3}{4} \times 8\frac{1}{2}$ in. Weight: 33lb. Pause facility. Press-button reset revolution counter. Straight-through amplifier on mono. Mono monitoring of input signal. Bass and treble cut and lift on recording and replay. 210V, 240V, 110V, 80W. Price: £116 (plus £29 PT).

### ST400 ★

Is the 4-track version of the previous model. Specification is the same except for: H and N  $7\frac{1}{2}$ -56dB;  $3\frac{3}{4}$ -53dB;  $1\frac{7}{8}$ -50dB. Price: £116 (plus £29 PT).

### Mk 6.M

Mains mono recorder.  $\frac{1}{2}$ -track. Speeds: 15,  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool:  $8\frac{1}{2}$ in. W and F:  $1\frac{7}{8}$ i/s 0.12%,  $3\frac{3}{4}$ i/s 0.1%,  $7\frac{1}{2}$ i/s 0.08%, 15i/s 0.05%. H and N:  $1\frac{7}{8}$ i/s 50dB,  $3\frac{3}{4}$ i/s 54dB,  $7\frac{1}{2}$ i/s 56dB, 15i/s 56dB. FR:  $1\frac{7}{8}$ i/s 50Hz-8kHz,  $3\frac{3}{4}$ i/s 50Hz-15kHz,  $7\frac{1}{2}$ i/s 20Hz-20kHz, 15i/s 20Hz-22kHz, all  $\pm 3$ dB. Replay char: CCIR. Rewind time: under 60 secs for 1,200ft. Illuminated edge-scale VU meter. Inputs: mic 0.1mV 200-250 ohms,

aux 5mV 250K, PU mag 4mV 47K, PU ceramic 160mV 1.5 megohms. Outlets: external amplifier 200mV into 10K, external speaker 15W into 8 ohms or 8W into 15 ohms. Speaker: 7" x 5in. Output: 15W RMS into 8 ohms (8W into 15 ohms). Transistorised. Own deck. Three motors (Papst outer rotor). Pause control. Straight-through amplifier. Monitoring. Input mixing. Accepts pickups direct. A/B switching. Size: 16½ x 7 x 18in. Weight: 35lb. Mains: 110, 210, 240V AC. Price: £124 (plus £31 PT).

## ■ CHILTON

Magnetic Tapes Ltd, Chilton Works,  
Garden Road, Richmond, Surrey.  
Tel: 01-876 7957.

### Chilton 100S

Transistorised stereo ¼ or ½-track three-speed recorder available as portable with in-built speakers (model 100S/CAP), or chassis in teak surround without power amplifiers (100S/CW), or with power amplifiers (100S/CAW). Speeds: 1⅞, 3¾, 7½ i/s. 7in reels. Rewind time: 150sec for 1,800ft. Deck uses hysteresis motor and four DC-operated diode-suppressed solenoids. W and F: 0.1% at 7½ i/s, 0.25% at 1⅞ i/s. FR: (±2 dB) via tape 30Hz-18kHz (7½ i/s), 40Hz-11kHz (3¾ i/s) and (±3dB) 50Hz-7kHz (1⅞ i/s). Signal/noise, unweighted, 50dB ¼-track and 53dB ½-track, all speeds. Replay char: IEC (NAB to order). Inputs per channel: mic 600 ohms-50K 0.4mV, radio 100K 40mV (DIN), gram 47K 1mV RIAA DIN. Outlets: line 2K 0.5V DIN, radio 10K 0.25V DIN, speakers (models with power amps) 10W at 8 ohms. LS impedance 4-16 ohms. Two 6 x 4in units per channel in model CAP. Stereo headphone jack socket. Size: (portable with lid) 14½ x 13⅞ x 6½ in; (chassis) 19 x 16 x 8in. Prices: (100S/CW—tape unit in teak surround for use with external amplifier. Output 0-3V at 600 ohms) £122 (plus £30.13 PT); (100S/CAW—with two 10W amplifiers and tone controls for use with external speakers) £132 (plus £32.40 PT); (100S/CAP—as CAW but in leatherette covered case with four inbuilt speakers) £140 (plus £34.58 PT); (200S/CAP—teak portable with four inbuilt speakers and transparent plastic lid) £150 (plus £37.05 PT).

### Extras

Two-track version £10 (plus £2.47 PT); lockable teak case and cover for type CW £6 (plus £1.48 PT); modifications for vertical operation £12 (plus £2.96 PT).

## ■ CINECODER

Murray Electronics Ltd, 5 Selkirk Road,  
Tooting, London, SW17. Tel: 01-672 8267.



Crown 800

Distributed by REW Audio Visual Ltd,  
266-268 Upper Tooting Road, London, SW17.  
Tel: 01-672 4471/2 and 9175.

### Cinecorder Model A

Mono recorder with BSR deck. ¼-track. Speed: 3¾ i/s. W and F 0.4%. FR 60Hz-10kHz. Replay char: CCIR. Two channel mixing with two inputs per channel. 4W 15 ohms output. One motor. 5½in spools. 10in elliptical speaker housed in detachable lid with 24ft cable. Separate bass and treble controls. Boost and cut. Superimposition. 'Shift-track' tape control for dual recordings. Tapelift/Pause control for cueing, cross-fading. Remote control. Accessories: mic and ext cables, perforated Cinetape, tape sprockets. Size: 16½ x 14 x 8½ in. Weight: 28lb. Price: £59 (including PT).

## ■ CROWN INTERNATIONAL

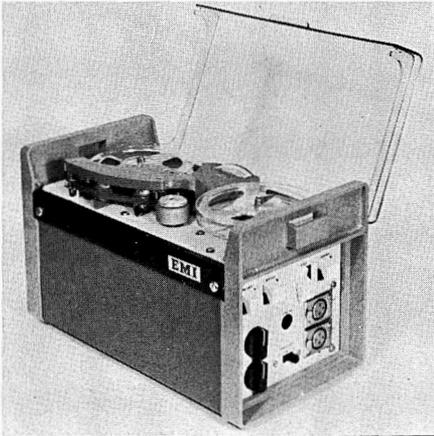
Distributor: Carston Electronics Ltd,  
71 Oakley Road, Chinnor, Oxon.  
Tel: 0844 52061.

London office: Shirley House, 27 Camden Road,  
London, NW1. Tel: 01-267 2748.

### 800 Series ★

¼-track and ½-track mono and stereo professional recorders. Three-speeds with 15i/s or 1⅞ i/s optional. Max spool: 10½ in. W and F: 15 i/s 0.06%; 7½ i/s 0.09%; 3¾ i/s 0.18% (RMS). H and N: 15i/s — 60dB; 7½ i/s — 60dB; 3¾ i/s — 55dB (below peak level). FR (±2dB): 15i/s 30Hz-30kHz; 7½ i/s 30Hz-25kHz; 3¾ i/s 30Hz-15kHz. Replay char: CCIR. VU meter. Rewind time: 58 seconds 2,400ft, 38 seconds 1,200ft. Inputs: 2 mixable inputs per channel, mic or line. Sensitivity: 45mV for 0 level (line), 0.4mV for 0 level (mic); impedance 100K, balanced or unbalanced 600 ohms, or 50/200 ohms. Output:

★ Indicates entry is illustrated



EMI L4



Ferguson 3248

600 ohms. Three motors, magnetic brakes, logic circuitry for tape handling, all tape commands can be remote. A-B monitoring, source and tape mixing, echo, individual bias adjustment and metering. Size:  $17\frac{1}{2} \times 19 \times 8$  in. Weight: 50lb. Price: £700 to £1,500.

## ■ EMI

EMI Electronics Ltd, Hayes, Middlesex.  
Tel: 01-573 3888.

### L4 ★

Transistorised 2-speed tape-recorder for mains/battery operation with level indicator.  $4\frac{1}{2}$  in spools.  $7\frac{1}{2}$ ,  $3\frac{3}{4}$  in/sec. FR: 50Hz-12kHz  $\pm 12$  dB. W and F: better than 0.2% RMS at  $7\frac{1}{2}$  in/sec; better than 0.3% RMS at  $3\frac{3}{4}$  in/sec. Inputs: Mic 50V for PRL 1K (suitable for 3/50 microphone); Mic 2: as for Mic 1; Line in, 270mV for PRL, 20K (bridging); Line out, 0dBm (0.775V) for PRL; 40 ohms into 200 ohm and 600 ohm lines. Replay char: IEC 70S or NAB 50S at  $7\frac{1}{2}$  in/sec

only. A-B monitoring,  $\frac{1}{2}$  or full-track. Neopitone version available. Audio output: 200mW RMS. Speaker: 3in. Own deck with DC motor. Fully tropicalised. Mic bass-cut switch. Remote motor on/off on  $\frac{1}{2}$ -track version. Dimensions:  $7 \times 11\frac{3}{4} \times 5\frac{3}{4}$  in. Weight:  $10\frac{3}{4}$  lb. Rechargeable battery or mains via charger. Prices on request. Supplied to scientific and professional users free of tax.

## ■ FERGUSON

British Radio Corporation Ltd,  
284 Southbury Road, Enfield, Middlesex.  
Tel: 01-366 1155.

### 3248 ★

$\frac{1}{4}$ -track mono recorder. 2-speeds. 7in reels. At  $3\frac{3}{4}$  in/s W  $\pm 0.3\%$ , F  $\pm 0.3\%$ , at  $1\frac{7}{8}$  in/s W  $\pm 0.4\%$ , F  $\pm 0.4\%$ . FR (6dB); radio input to low-level output:  $3\frac{3}{4}$  in/s 40Hz-14kHz,  $1\frac{7}{8}$  in/s 40 Hz-7kHz. Replay char: DIN. Level meter (illuminated). Rewind time: 2 min 40 sec 1,200ft. Inputs: mic/radio 0.2mV 2K, gram 220mV 2.2 meg. Outputs: ext speaker 8 ohms or 30-100 ohm phones, ext amps 500mV 10K, 6-pin accessories socket. 4.5W (5% distortion) to  $5\frac{1}{2} \times 2\frac{3}{4}$  in speaker. Deck BRC series F. Inching, pause control, monitoring, parallel track replay, auto recording level control with manual over-ride, auto tape stop, tape position indicator, bass and treble controls. Transistorised. 240V 50Hz mains. Size  $15\frac{1}{4} \times 11 \times 5\frac{1}{4}$  in. MC mic, LP tape, record/playback lead and ext speaker plug included. Price: £45.05 (plus £10.60 PT).

### 3252

$\frac{1}{4}$ -track stereo recorder. 3-speeds, 7in reels. W and F:  $7\frac{1}{2}$  in/s 0.15%,  $3\frac{3}{4}$  in/s 0.2%,  $1\frac{7}{8}$  in/s 0.25%. H and N: -45dB. FR (6dB):  $7\frac{1}{2}$  in/s 40 Hz-18 kHz. Replay char: CCIR. Level meter. Rewind time: 3 min 20 sec 1,800ft. Inputs: mic, PU (high impedance), PU (low impedance). Outputs: ext speakers 5W 8 ohms, ext amps 500mV 10K. 5W output from  $5 \times 3$  in speakers. Track transfer switch. Solenoid operated remote pause and auto stop. Mains: 45W. Size:  $16\frac{1}{2} \times 14\frac{1}{4} \times 7\frac{1}{2}$  in. Price: £60.71 (plus £14.29 PT).

### 3258 ★

$\frac{1}{4}$ -track mains stereo recorder. Speed:  $3\frac{3}{4}$  in/s. Max spool 7in. W and F: 0.3%. H and N: -42dB. FR: 40Hz-14kHz  $\pm 6$  dB. Replay char: CCIR. Rewind time: 2 mins 40 secs for 1,200ft. Meter level indicator. Inputs: mic 0.2mV 2K, radio 220mV 10K, line 500mV 10K. Outputs: stereo phones 8 ohms, ext speakers 8 ohms, earphone (monitor) 1-2K. Output: 2.5W RMS per channel. Speakers:  $5\frac{3}{8} \times 2\frac{3}{4}$  in. BRC deck. Pause control. Vertical or horizontal operation. Auto recording level with manual over-ride. Slider controls. Size:  $18\frac{1}{2} \times 5\frac{3}{4} \times 11$  in. Price: £60.71 (plus £14.29 PT).



Ferguson 3258

### ■ FERROGRAPH CO LTD

The Hyde, Edgware Road, Colindale,  
London, NW9. Tel: 01-205 2241.

#### Ferrograph 713

Semi-professional mains mono recorder.  $\frac{1}{2}$ -track. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool  $8\frac{1}{4}$ in. W and F:  $7\frac{1}{2}$ i/s 0.08%,  $3\frac{3}{4}$ i/s 0.15%,  $1\frac{7}{8}$ i/s 0.2%. H and N:  $7\frac{1}{2}$ i/s better than 55dB. FR:  $7\frac{1}{2}$ i/s 30Hz-17kHz  $\pm 2$ dB,  $3\frac{3}{4}$ i/s 40Hz-14kHz  $\pm 3$ dB,  $1\frac{7}{8}$ i/s 50Hz-7kHz  $\pm 3$ dB. Replay char: DIN. VU meter. Rewind time less than one minute for 1,200ft. Inputs: mic 300 $\mu$ V to 15mV at 250-2,000 ohms, line 50mV to 10V at 2 megohms. Outputs: 600 ohms, 300mV 10K, 8-16 ohms 10W. Output: 10W RMS. Two 6 $\times$ 4in speakers. Transistorised. Three motors (synchronous hysteresis capstan motor and shaded pole spool motors). Pause. Four-digit gear driven tape indicator. Straight-through amplifier. Monitoring. Input mixing. Vertical or horizontal operation. Single knob control. Fast wind continuously variable in either direction. Remote start/stop of tape, also time-switch operation. Removable head block. Straight line tape loading. Automatic stop. Reel retainers. Retractable carrying handle. A-B comparison switch. Separate bass and treble controls with cut or lift. Meter indicates signal level on record and playback. Meter switchable to indicate bias. Bias continuously adjustable. Supplied in two styles. Suffix P: portable wood case leathercloth covered; Suffix W: wooden case, natural wood finish; Mains: (Suffix U) 200-250V 50Hz; (Suffix A) 117V 60Hz. Price:  $\pounds 207.35$ .

#### Ferrograph 713H

Similar specifications to 713 except tape speeds 15,  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ i/s. FR at 15i/s 30Hz-20kHz  $\pm 2$ dB. Price:  $\pounds 217.40$  (including PT).

#### Ferrograph 722

Similar specification to 713 except  $\frac{1}{2}$ -track stereo version. Track to track transfer switch. Switchable echo. Records mono on upper or lower tracks. Channel separation: stereo approx 50dB, mono better than 65dB. Price:  $\pounds 266.41$  (including PT).

#### Ferrograph 722H

Similar specification to 722 except tape speeds 15,  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ i/s. FR at 15i/s 30Hz-20kHz  $\pm 2$ dB. Price:  $\pounds 276.47$  (including PT).

#### Ferrograph 702

Similar specification to 722 except tape unit with preamps only. Additional low level output adjustable 0-300mV. Price:  $\pounds 228.71$  (including PT).

#### Ferrograph 702H

Similar specification to 702 except tape speeds 15,  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ i/s. FR at 15i/s 30Hz-20kHz. Price:  $\pounds 238.77$  (including PT).

#### Ferrograph 724

Similar specification to 722 except  $\frac{1}{4}$ -track version. Price:  $\pounds 266.41$  (including PT).

#### Ferrograph 704

Similar specification to 702 except  $\frac{1}{4}$ -track version. Price:  $\pounds 228.71$  (including PT).

### ■ GOLDING AUDIO LTD

Marks Tey, Colchester, Essex.  
Tel: Colchester 210433.

#### ST856

Eight-track stereo tape player unit. 400ft stereo cartridge. Speed:  $3\frac{3}{4}$ i/s. W and F:  $< 0.3\%$ . Output: 5W RMS per channel. Size:  $13\frac{3}{4} \times 9\frac{3}{4} \times 4\frac{1}{2}$ in. Weight: 9.9lb. AC mains. Price:  $\pounds 45$  (plus  $\pounds 11$  PT).

#### HW800 System 8

Eight-track stereo tape player unit. 400ft stereo cartridge. Speed:  $3\frac{3}{4}$ i/s. W and F:  $< 0.2\%$ . FR: 30Hz-14kHz. Inputs: mag PU 2mV, radio 250mV, aux 250mV. Output: 10W RMS per channel. Output impedance: 8 ohms. One four-pole synchronous motor. Pushbutton programme selector. Size:  $14\frac{1}{2} \times 4\frac{1}{2} \times 8\frac{3}{4}$ in. Weight: 15.4lb. Price:  $\pounds 70$  (plus  $\pounds 17.88$  PT).

### ■ GRUNDIG (Great Britain) LTD

Newlands Park, Sydenham, London, SE27.  
Tel: 01-778 2211.

#### TK121

Mains operated  $\frac{1}{2}$ -track recorder. Transistors. Slider controls for volume, tone and record level. Straight-through amplifier. 10 transistors, 3 diodes. Speed:  $3\frac{3}{4}$ i/s. FR: 40Hz-12.5kHz. H and N:  $-52$ dB. Max spool  $5\frac{1}{2}$ in. Four-digit tape position indicator. Record level meter. Inputs: mic 1mV 100K, radio 1-500mV 50K.

★ Indicates entry is illustrated

Outputs: speaker 4W 4 ohms, line 500mV 22K. W and F:  $\leq 0.2\%$ . Mains: 115-230V 50Hz. Size:  $15\frac{1}{2} \times 11\frac{1}{4} \times 6\frac{1}{2}$ in. Weight:  $17\frac{3}{4}$ in. Price: £56.85 (including PT).

**TK141 ★**

Mains operated  $\frac{1}{4}$ -track recorder. H and N: -50 dB. Monitor. All other details as for TK121. Price: £61.85 (including PT).

**TK146 ★**

Mains operated  $\frac{1}{4}$ -track recorder. Automatic and manual record level. Slider controls for volume, tone and record level. Record level meter. Straight-through amplifier. FR: 40Hz-12.5kHz. H and N: -50dB. Max spool:  $5\frac{3}{4}$ in. Speed:  $3\frac{3}{4}$ i/s. W and F:  $\leq 0.2\%$ . Four-digit tape position indicator. Inputs: mic 1mV 100K, radio 100mV 50K. Outputs: 4W 4 ohms, line 500mV 27K. Size:  $6\frac{1}{2} \times 15\frac{1}{2} \times 11\frac{1}{4}$ in. Weight:  $17\frac{3}{4}$ lb. Price: £68.14 (including PT).

**TK246 ★**

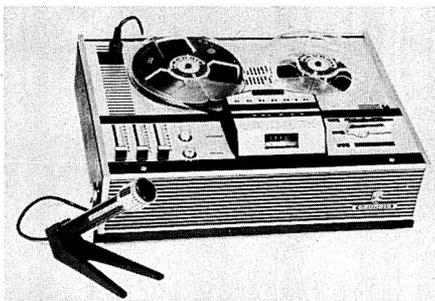
Mains 2-speed  $\frac{1}{4}$ -track stereo recorder. Mono playback, stereo playback with external amplifier. Automatic or manual record level with meters. Speeds:  $3\frac{3}{4}$ ,  $7\frac{1}{2}$ i/s. 19 transistors, 12 diodes. W and F: 0.15% at  $7\frac{1}{2}$ i/s, 0.2% at  $3\frac{3}{4}$ i/s. H and N: -50dB. FR: 40Hz-16kHz at  $7\frac{1}{2}$ i/s, 40Hz-12.5kHz at  $3\frac{3}{4}$ i/s. Four-digit tape position indicator. Max spool: 7in. Inputs: mic (2) 1mV 100K, radio (2) 1mV 33K, PU (2) 50mV 1.5 megohm. Outputs: 4W 4 ohms, line (2) 800mV 20K. Mains: 110-240V 50Hz. Size:  $7\frac{3}{4} \times 17 \times 13\frac{3}{4}$ in. Weight: 26lb approx. Operates horizontally or vertically. Price: £128.88 (including PT).

**TK248 ★**

Mains 2-speed  $\frac{1}{4}$ -track full stereo recorder. Stereo record and playback. Multi-synchronous and echo recordings. Straight-through amplifier. Speeds:  $3\frac{3}{4}$ ,  $7\frac{1}{2}$ i/s. W and F:  $\leq 0.15\%$  at  $7\frac{1}{2}$ i/s,  $\leq 0.2\%$  at  $3\frac{3}{4}$ i/s. Large illuminated VU meters. Max spool: 7in. 22 transistors, 12 diodes. FR: 40Hz-16kHz at  $7\frac{1}{2}$ i/s, 40Hz-12.5kHz at  $3\frac{3}{4}$ i/s. H and N: -50dB. Inputs: mic (2) 1mV 100K, radio (2) 1mV 33K, PU (2) 50mV 1.5 megohms. Outputs: line (2) 800mV, 20K, speaker (2) 4W 4 ohms. Four speakers. Four-digit tape position indicator. Size:  $7\frac{3}{4} \times 17 \times 13\frac{3}{4}$ in. Weight: 30 $\frac{1}{2}$ lb. Price: £157.40 (including PT).

**TK3200 Hi-Fi**

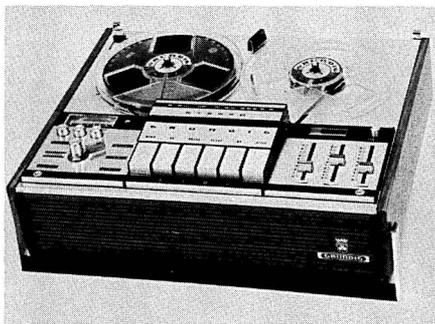
Semi-professional class portable recorder designed to operate from mains or batteries.  $\frac{1}{4}$ -track. Mono. Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$ ,  $7\frac{1}{2}$ i/s. Automatic or manual record level. Separate controls for record level and replay volume. Independent bass and treble controls. Max spool:  $5\frac{3}{4}$ in. Three heads. 31 transistors. Four-digit tape position indicator. FR: 40Hz-16kHz at  $7\frac{1}{2}$ i/s, 40Hz-12.5kHz at  $3\frac{3}{4}$ i/s, 40Hz-8kHz at  $1\frac{7}{8}$ i/s. Dynamic range: 52dB at  $7\frac{1}{2}$ i/s, 50dB at  $3\frac{3}{4}$ i/s,



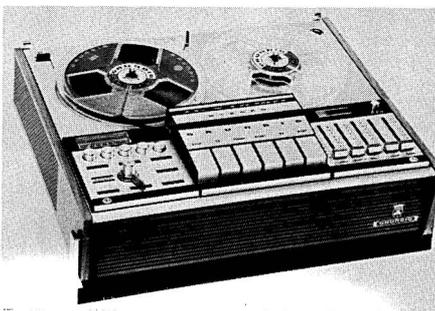
Grundig TK141



Grundig TK146



Grundig TK246



Grundig TK248

48dB at  $1\frac{7}{8}$ i/s. W and F:  $\leq 0.15\%$  at  $7\frac{1}{2}$ i/s,  $\leq 0.2\%$  at  $3\frac{3}{4}$ i/s,  $\leq 0.35\%$  at  $1\frac{3}{4}$ i/s. Special mechanical tape tensioner. Remote control microphone switch. Inputs: mic 0.22mV 10K, radio 0.22mV 10K, PU 45mV 2.2 megohms. Output: 800mV to internal speaker, 2W to external speaker. Power supply: six SP2 cells, six rechargeable cells or Grundig mains unit type TN30. Size:  $9\frac{1}{2} \times 12\frac{1}{4} \times 3\frac{3}{4}$ in. Weight: 12lb. Price: £149.65 (including PT).

#### TK147 ★

Mains single-speed  $\frac{1}{4}$ -track automatic stereo recorder. Mono playback, stereo playback with external amplifier and speaker. Speed:  $3\frac{3}{4}$ i/s. 18 transistors, 10 diodes. W and F:  $\leq 0.2\%$ . H and N:  $\geq 47$ dB. FR: 40Hz-12.5kHz. Four-digit tape position indicator. Max spool:  $5\frac{3}{4}$ in. Inputs: mic (2) 1mV 100K, radio (2) 1mV 50K, PU(2) 50mV 2 megohms. Outputs: line(2) 500mV 22K, 4 ohms 4W. Mains: 110-240V AC 50Hz. Size:  $15\frac{1}{4} \times 11\frac{1}{4} \times 6\frac{1}{4}$ in. Weight: 17lb approx. Price: £96.20 (including PT).

■ **HEATHKIT** See Constructional Kits Section.

#### ■ HITACHI SALES (UK) LTD

Park House, Coronation Road, Park Royal, London, NW107QS. Tel: 01-965 9861. Telex: 923268.

#### TRQ206

Cassette recorder suitable for operation from AC mains, internal batteries or car battery. Speed:  $1\frac{7}{8}$ i/s. Cassette automatically ejects at end of tape on record and replay. Lamps provided for record level and battery life indicator. Size:  $9\frac{1}{2} \times 3\frac{3}{8} \times 10\frac{1}{2}$ in. Price: £59.95 (including PT).

#### TRQ232S

Stereo cassette recorder with separate speaker enclosures. Speed:  $1\frac{7}{8}$ i/s. Twin VU meters. Output: 3W per channel. Operates from mains or battery. Battery check meter. Size: (recorder)  $12\frac{3}{4} \times 8\frac{1}{4} \times 4\frac{3}{8}$ in; (speaker boxes)  $8\frac{1}{4} \times 6\frac{3}{8} \times 2\frac{1}{8}$ in. Price: £66.50 (including PT).

#### TPQ115

Eight-track cartridge stereo tape player with separate speaker enclosures. Speed:  $3\frac{3}{4}$ i/s. Output: 7W per channel. Straight-through amplifier. Walnut finished cabinet. Size: (recorder)  $15\frac{3}{4} \times 4\frac{3}{4} \times 11\frac{3}{8}$ in; (speaker boxes)  $11\frac{3}{8} \times 7\frac{7}{8} \times 5\frac{7}{8}$ in. Price: £72.95 (including PT).

#### TRQ202

$\frac{1}{4}$ -track stereo cassette recorder with separate speaker enclosures. Speed:  $1\frac{7}{8}$ i/s. Compact cassettes. Output: 3W per channel. Automatic record level. Separate playback volume controls for each channel. Inputs for mic, radio, aux.



Grundig TK147

Outputs for speakers and line. Size: (recorder)  $11\frac{1}{2} \times 3\frac{1}{2} \times 9\frac{1}{4}$ in; (speaker boxes)  $7\frac{1}{8} \times 11\frac{3}{8} \times 5\frac{7}{8}$ in. Price: £79.95 (including PT).

#### TRQ707

$\frac{1}{4}$ -track stereo tape recorder with separate speaker enclosures. Three speeds. Auto-stop device. Automatic level control. Vertical or horizontal operation. Max spool 7in. VU meter. Tone control. Pause control. Size:  $14\frac{3}{4} \times 8\frac{3}{4} \times 14$ in. Price: £119.

#### TRQ777

$\frac{1}{4}$ -track three-speed stereo tape recorder. Push-button controls. Automatic repeat facility. Automatic level control. Two tone controls. Two VU meters. Automatic reverse. Size: (recorder)  $16 \times 17\frac{3}{4} \times 8\frac{7}{8}$ in; (speaker boxes)  $16 \times 17\frac{3}{4} \times 11\frac{3}{4}$ in. Price: £199 (including PT).

New range of tape recorders being introduced shortly. Details of prices and specifications not available at time of going to press.

#### ■ KELLAR ELECTRONICS LTD

Lopen Works, Lopen Road, Edmonton, N18.

New range of tape record and playback equipment incorporating Dolby B noise reduction system and Garrard cassette deck. Full details not available as this edition of the Year Book closed for press.

See Tape Amplifier Section for details of Kellar KDB-1 noise reduction unit for use between tape unit and main amplifier.

#### ■ KINGSTEREO

Distributors: Lionel Murray Ltd, 7 West Halkin Street, Belgrave Square, London, SW1. Tel: 01-235 6424-5-6.

#### XAR500

4-track record/playback tape player. Price: £140 (including PT).

★ Indicates entry is illustrated

## HW12

4- and 8-track stereo cartridge tape player. FR: 50Hz-10kHz. W and F: <0.3%. Power output: 4W (music) into speakers supplied. Finish: mahogany. Dimensions: 13½ × 8½ × 3½ in. Price: £89 (including PT).

Wide range of 4-track stereo pre-recorded tape cartridges is available for this equipment.

## LEEVEERS-RICH EQUIPMENT LTD

319 Trinity Road, Wandsworth, London, SW18.  
Tel: 01-874 9054.

Cables: Leemag, London, SW18.

### Series E

Professional ½ in recorders. Available in broadcast type M console, enclosed rack or as units for rack mounting.

### Model E200 ★

Speeds: 7½/15i/s. 3¾/7½i/s or 15/30i/s to special order. Max spool 11½ in. Three motors. Full-track, twin-track or stereo. FR 40Hz-18kHz. Noise: Full track -62dB, twin track -58dB. W and F: better than 0.1% at all speeds. VU level meter. PPM to special order. Fully transistorised amplifiers. Modular construction throughout. Prices from £770.

### Series G and H

Professional ½ in and 1 in master recorders. Available in studio type S console.

### Model G800

Speeds: 7½/15i/s. Max spool 10½ in NAB. Three motors. Full track preselection facilities. Sync replay and routing. FR 40Hz-18kHz. Equalisation by plug-in cards. Price: £5,450.

### Model H400

Same specification as G800 but four tracks on ½ in tape. Price: £3,300.

## LUXOR

Distributors: Luxitone, 84 Bolsover Street, London, W1. Tel: 01-636 2901.

### MP813

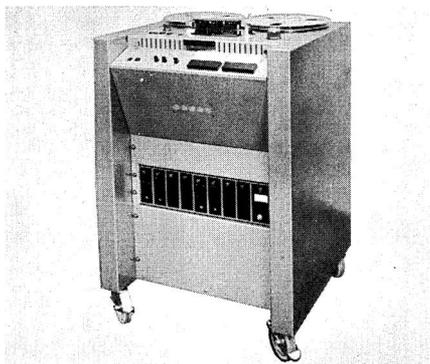
Stereo tape recorder with amplifiers and monitor speakers. Speeds: 1½, 3¾, 7½i/s. Four-track. Max spool 7 in. Output: 10W RMS per channel. Inputs: mic, PU, radio. Outputs: speakers, headphones, amplifier. Size: 7¼ × 20½ × 15 in. Price: £175 (including PT).

### MP823

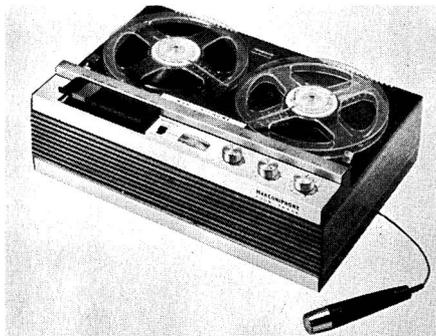
Identical specification to MP813 but without the built-in amplifier. Price: £135 (including PT)

## MARCONIPHONE

British Radio Corporation Ltd,  
284 Southbury Road, Enfield, Middlesex.  
Tel: 01-366 1155.



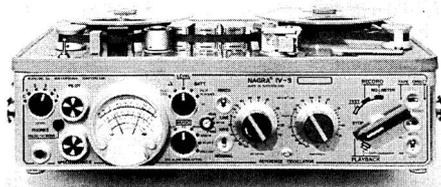
Leever-Rich E200



Marconiphone 4248



Marconiphone 4261



Nagra IV-5

**4248 ★**

$\frac{1}{4}$ -track mono recorder. 2-speeds. 7in reels. At  $3\frac{3}{4}$ i/s W  $\pm 0.3\%$  F  $\pm 0.3\%$ , at  $1\frac{7}{8}$ i/s W  $\pm 0.4\%$  F  $\pm 0.4\%$ . H and N: -45dB. FR:  $3\frac{3}{4}$ i/s 40Hz-14kHz,  $1\frac{7}{8}$ i/s 40Hz-7kHz. Replay char: DIN. Level meter (illuminated). Rewind time: 2 min 40 sec 1,200ft. Inputs: mic/radio 0.2mV 2K, gram 220mV 2.2 meg. Outputs: ext speaker 8 ohms, ext amps 500mV 10K, 3-pin accessories socket. 5W to  $7 \times 3\frac{3}{8}$ in speaker. BRC series F deck. Pause control, inching, monitoring, parallel track replay, auto recording level control with manual over-ride. Auto tape stop, tape position indicator, bass and treble controls. Transistorised. 240V 50Hz. Size:  $5\frac{1}{4} \times 15\frac{3}{4} \times 11$  in. Price: £45.07 (plus £10.60 PT).

**4261 ★**

$\frac{1}{4}$ -track mains recorder. Speeds:  $7\frac{1}{2}$ i/s,  $3\frac{3}{4}$ i/s,  $1\frac{7}{8}$ i/s. Max spool 7in. W and F:  $7\frac{1}{2}$ i/s 0.15%,  $3\frac{3}{4}$ i/s 0.25%,  $1\frac{7}{8}$ i/s 0.35%. H and N: -45dB. FR:  $7\frac{1}{2}$ i/s 40Hz-18kHz,  $3\frac{3}{4}$ i/s 40Hz-14kHz,  $1\frac{7}{8}$ i/s 40Hz-7kHz. Replay char: CCIR. Rewind time 2 min 40 sec for 1,200ft. Meter level indicator. Inputs: mic, radio 250mV 4.7K, PU 50mV 1 megohm. Outlets: line 500mV 10K, external speakers 8 ohms. Remote pause socket. Output: 5W music power per channel. Speakers:  $5\frac{3}{8} \times 2\frac{3}{8}$ in per channel. BRC tape deck. Pause control. Straight-through amplifier. Monitoring. Track transfer. Size:  $16\frac{1}{2} \times 6\frac{1}{2} \times 14\frac{1}{2}$ in. Mains: 230-250V AC. Price: to be announced.

**■ NAGRA**

Distributed by: Hayden Laboratories Ltd, East House, Chiltern Avenue, Amersham, Bucks. Tel: Amersham 5511.

Audio equipment showroom, service department and despatch department: 12/13 Poland Street, London, W1V 3DE. Tel: 01-734 3748/9.

**Series IV ★**

Professional battery portable tape recorder. Full track mono. Front panel controls. 5-step low frequency roll-off attenuator. Modular assembly, changeable to meet requirements. Changeable internal pre-amps for special microphones. AR indicator of correct operation. All-silicon transistors. Automatic level control. Automatic overload reduction. Fade in and out for start and stop. Self-powered. Prices do not include batteries, tape, microphone and leather carrying case.

**IV A**

Automatic machine for reporting. It has single speed  $7\frac{1}{2}$ i/s or 15i/s. One microphone input with automatic level control. Price: £427.

**IV D**

Three speed model ( $3\frac{3}{4}$ ,  $7\frac{1}{2}$  and 15i/s). Two

**Nagra Series IV**

microphone inputs with manual and automatic level control. FR 15i/s 30Hz-20kHz  $\pm 2$ dB;  $7\frac{1}{2}$ i/s 30Hz-15kHz  $\pm 2$ dB;  $3\frac{3}{4}$ i/s 30Hz-7kHz  $\pm 3$ dB. Signal to noise ratio: 69dB. Price: £586; ( $7\frac{1}{2}$ i/s only with ALC) £518.

**IV L**

As IV D, but fitted with the Neopilot synchronous system. Price: £655; ( $7\frac{1}{2}$ i/s only with ALC) £586.

**IV AL**

Identical to Model IV A but with addition of Neopilot system. Price: (with one microphone preamplifier QPM-1-200) £500.

**IV M**

Corresponds to the IV D in the M Series. Three speeds. F device and limiter incorporated. Input: 560mV (corresponding to 0dB, 200mV max). Input impedance 2K. Output: same level as input with source impedance of 5K (load impedance should be 50K or higher). Input and output unbalanced. Not Neopilot model. Price: £374.

**IV ML**

Similar to IV M but with Neopilot. Price: £445.

Optional extras (plug-in): frequency meter QFM50 £36; synchroniser QSLI £34; crystal controlled pilot generator QGX50/60 £80.

**Stereo Nagra IV-S ★**

$\frac{1}{4}$ -track, battery-operated professional stereo recorder. Speeds:  $3\frac{3}{4}$ ,  $7\frac{1}{2}$ , 15i/s. Max spool: 5in with lid closed, 7in with lid open,  $10\frac{1}{2}$ in with special accessory. W and F: 15i/s  $\pm 0.005\%$ ,  $7\frac{1}{2}$ i/s  $\pm 0.08\%$ ,  $3\frac{3}{4}$ i/s  $\pm 0.15\%$  (all to DIN 45 507). H and N: 15i/s 70dB (ASA 'A' with tape) per channel; (CCIR) 68dB (ASA 'A' with tape) per channel. FR: 15i/s 30Hz-18kHz  $\pm 2$ dB. Re-

★ Indicates entry is illustrated

play char: NAB or CCIR versions. Rewind time: one minute for 600ft. Level indicator: coaxial needles PPM. Inputs: two microphone inputs switchable to suit any professional dynamic or capacitor microphone, two-line inputs 0.37V to 120V continuously variable, 100K. Outputs: stereo phones 560mV per channel 50 ohms, line 1.5V 600 ohms balanced. Miniature monitoring speaker. One DC series-commutator motor. Own deck. Input mixing. Monitoring. Piloton pulse model IV-S also available. Push-button headphone phase check. Switchable limiter. Nagramaster recording position. Visual indicators for speed, power and Piloton signal. Size:  $14 \times 9\frac{5}{8} \times 4\frac{1}{2}$  in. Weight: 14lb 2oz (with batteries). Supply: 12 U2 batteries (internal), external batteries or mains power supply optional extra. Price: (model IV-S) £649; (model IV-SL with piloton facility) £731.

#### Miniature Nagra SN ★

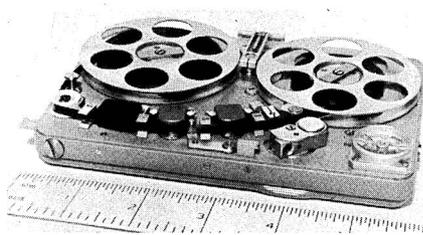
Full-track battery-operated professional stereo recorder. Speeds: (model SNN)  $3\frac{3}{4}$ ,  $1\frac{7}{8}$  i/s; (model SNS)  $1\frac{1}{8}$ ,  $\frac{1}{2}$  i/s. Spool capacity: 160 metres standard tape, 320 metres 12.5 micron tape. W and F:  $3\frac{3}{4}$  i/s  $\pm 0.1\%$ ,  $1\frac{7}{8}$  i/s  $\pm 0.15\%$  (both to DIN 45 507). H and N:  $3\frac{3}{4}$  i/s 60dB (ASA 'A' with tape);  $1\frac{7}{8}$  i/s 55dB (ASA 'A' with tape). FR: 80Hz-12kHz  $\pm 2$  dB. Replay char: CCIR. Rewind time: (hand winding) 60 seconds. Meter level indicator. Inputs: microphone, current input from 200 ohms or greater source ( $3\mu$  ARMS, max level  $100\mu$  ARMS). Alternatively line input for nominal modulation level from 100 ohms source - 160mV RMS. Outlets: line 600mV across 1K, headphones. One DC series commutator motor. Own deck. Compression indicator and battery check meter. Remote control start/stop. Piloton version available. Size:  $5\frac{3}{4} \times 4 \times 1\frac{1}{2}$  approximately. Weight: 1.3lb (including batteries and tape). Supply: two manganese cells (Mallory Mnl500 or equivalent). Price: £401.

#### ■ NORDEMEUDE

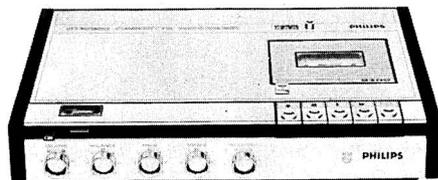
Distributors: TAK Continental Importers,  
16a High Street, Stone, Staffordshire.  
Tel: Stone 3232, 3233.

#### 6001

Stereo tape recorder.  $\frac{1}{4}$  and  $\frac{1}{2}$  track. Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$  and  $7\frac{1}{2}$  i/s. W and F: 0.15% at  $7\frac{1}{2}$  i/s. FR: 40Hz-17kHz  $7\frac{1}{2}$  i/s, 40Hz-14kHz  $3\frac{3}{4}$  i/s, 40Hz-7.5kHz  $1\frac{7}{8}$  i/s. Output: 3W per channel into two built-in speakers. Features: pushbutton controls, mono and stereo recording, both  $\frac{1}{4}$  and  $\frac{1}{2}$  track operation; sockets for AF amp, radio, gram and headphone monitoring; dual meters and illuminated track indicators. Finish: natural walnut. Dimensions:  $20 \times 16 \times 6\frac{1}{2}$  in (approx). Price: £126 (including PT).



Nagra Miniature SN



Philips N2400



Philips N4404



Philips N4308

**PHILIPS ELECTRICAL LTD**

Century House, Shaftesbury Avenue,  
London, WC2.

Tel: 01-437 7777. Cables: Phillamps, London.

**N2400 ★**

Mains operated stereo cassette recorder. Speed:  $1\frac{7}{8}$ i/s. W and F: <0.4%. H and N: > -45dB. FR: 60Hz-10kHz. Replay char: CCIR. Rewind time: <80 secs for C60 cassette. Meter level indicator. Inputs: mic 0.25mV 2K, PU 100mV 1 megohm. Outlets: radio 1V 20K, speakers (2) 4W 8 ohms. Output: 4W RMS per channel. External speakers. Transistors. Own deck. One motor. Pause. Straight-through amplifier. Monitoring. Size:  $14 \times 8\frac{7}{8} \times 3\frac{3}{8}$ in. Weight: 6 $\frac{1}{2}$ lb. Mains: 110/250V 50/60Hz. Price: (less speakers) £54.52 (plus £13.48); (with speakers) £72.16 (plus £17.84).

**N2401 ★**

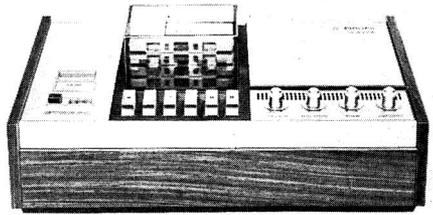
Mains operated stereo cassette recorder. Speed:  $1\frac{7}{8}$ i/s. W and F: <0.3%. H and N: > -43dB. FR: 60Hz-10kHz. Replay char: CCIR. Rewind time: 100sec for C60 cassette. Meter level indicator. Inputs: mic/radio 0.25mV 2K, PU 100mV 1 megohm. Outlets: diode 1V 20K, speakers (2) 4W 8 ohms. Output: 4W RMS per channel. External speakers. Transistors. Own deck. One motor. Pause. Monitoring. Straight-through amplifier. Automatic cassette changer. Size:  $15\frac{1}{4} \times 9\frac{1}{4} \times 6\frac{3}{8}$ in. Weight: 11lb. Mains: 110/250V 50/60Hz. Price: (less speakers) £64.94 (plus £16.06); (with speakers) £82.59 (plus £20.41).

**N2503**

Mains operated stereo cassette recorder to fit in with Audio plan Equipment. Speed  $1\frac{7}{8}$ i/s. W and F: 0.4% DIN weighted. H and N: better than 45dB. FR: 60Hz-10kHz. Rewind time: <80sec for C60. Meter level indicator. Input/output sockets for external amplifier. Input/output socket for phono/micro. One motor. Pause. Size:  $8\frac{1}{2} \times 8\frac{1}{2} \times 2\frac{3}{8}$ in. Weight: 4 $\frac{1}{2}$ lb. Mains: 110/240V 50/60Hz. Price: £43.30 (plus £10.70 PT).

**N4308 ★**

Mains operated  $\frac{1}{4}$ -track mono recorder. Speeds:  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool: 7in. W and F: <0.25%. H and N: > -45dB. FR:  $3\frac{3}{4}$ i/s 60Hz-14kHz,  $1\frac{7}{8}$ i/s 80Hz-8kHz. Replay char: CCIR. Rewind time: <3 minutes for 1,200ft. Meter level indicator. Inputs: mic 0.25mV 2K, radio 2mV 20K, PU 100mV 1 megohm. Outlets: diode 1V 20K, headphones 0.1-5V 1K, speaker 4W 8 ohms. Output: 4W RMS. Speaker: 6×4in. Transistors. Own deck. One motor. Pause. Straight-through amplifier. Monitoring. Input mixing. Parallel track replay. Size:  $16\frac{1}{2} \times 11\frac{3}{4} \times 5\frac{7}{8}$ in. Weight: 17 $\frac{3}{4}$ lb. Mains: 200-250V 50Hz. Price: £48.98 (plus £11.53 PT).



Philips N2401



Philips N4407

**N4404 ★**

Mains operated stereo  $\frac{1}{4}$ -track recorder. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ i/s. Max spool: 7in. W and F: <0.15% H and N: > -45dB. FR:  $7\frac{1}{2}$ i/s 40Hz-18kHz,  $3\frac{3}{4}$ i/s 40Hz-16kHz. Replay char: CCIR. Rewind time: <200sec for 1,800ft. Meter level indicator. Inputs: mic 0.25mV 2K, radio 2mV 20K, PU 100mV 1 megohm. Outlets: diode 1V 20K, speaker (2) 2.5W 8 ohms. Output: 2.5W RMS per channel. Speakers: 6×4in. Transistors. Own deck. One motor. Pause. Straight-through amplifier. Monitoring. Input mixing. Parallel track replay. Size:  $19 \times 13\frac{3}{8} \times 7\frac{1}{2}$ in. Weight: 24lb. Mains: 110/250V 50/60Hz. Price: £76.91 (plus £18.09 PT).

**N4407 ★**

Mains operated stereo  $\frac{1}{4}$ -track recorder. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool: 7in. W and F: <0.15%. H and N: > -45dB. FR:  $7\frac{1}{2}$ i/s 40Hz-18kHz,  $3\frac{3}{4}$ i/s 40Hz-15kHz,  $1\frac{7}{8}$ i/s 60Hz-10kHz. Replay char: CCIR. Rewind time: <200 secs for 1,800ft. Two meter level indicators. Inputs: mic 0.25mV 2K, radio 2mV 20K, PU 100mV 1 megohm. Outlets: diode 0.1V 20K, headphones 0.4V 600 ohms, speakers (2) 4W 8 ohms. Output: 4W RMS per channel. Speakers: 6×4in. Transistors. Own deck. One motor. Pause.



Pye 9123

■ **PYE**

Pye Ltd, St Andrews Road, Cambridge.  
Tel: Cambridge 58985.

**9123 ★**

Four-track recorder. Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$ i/s. Max. spool: 7in. Duoplay, multiply and stereo playback facilities with suitable accessories. Output: 4W. Speaker: 6 × 4in. Price: £60.

**9137**

Four-track stereo recorder. Full specifications on request. Price: £103.80.

**9116 ★**

Four-track stereo cassette recorder. Speed:  $1\frac{7}{8}$ in. Compact cassette. W and F: 0.35% measured with EMT420. H and N: 45dB (DIN). FR 60Hz-10kHz (DIN and within 6dB). Replay char: DIN. Meter level indicator. Inputs: microphone 0.2mV 2K, radio/PU 100mV 1 megohm. Outlets: line 0.5V 20K, ext speaker 4-8 ohms 4W per channel. Output: 4W RMS per channel. Separate speaker units. One motor. Philips tape transport. Rewind time < 70 secs (C60 cassette). Pause. Straight-through amplifier. Monitoring. Mono or stereo record and playback. Auto tape stop. Illuminated level meter. Three-digit tape indicator. Anti-erasure device. Size: 14 × 3 × 8½in. Weight: 6½lb. Price: (excluding speakers) £54.52 (plus £13.48 PT). Suggested speaker enclosures LSE4: £16 pair.



Pye 9116 and LSE4 speakers

Straight-through amplifier. Monitoring. Input mixing. Parallel track replay. Track transfer. Size: 19 × 13¾ × 7½in. Weight: 24lb. Mains: 110/250V 50/60Hz. Price: £89.05 (plus £20.95 PT).

**4408**

¼-track stereo mains recorder. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool 7in. W and F ±0.2%. SN > 45dB. FR  $7\frac{1}{2}$ i/s 40 Hz-18kHz. Two level indicators (meters). Rewind time < 180 secs 1,800ft. Inputs: two mic 0.25V 2K, two radio 2mV 20K, two PU 100mV 500K. Outlets: radio 1V, phones 0-1.5V, two speakers 6W 4-8 ohms. Output: 6W per channel. Own deck. One motor. Pause. Straight-through amplifier. Monitoring. Input mixing. Parallel track replay. Vertical or horizontal operation. Mains 110, 127, 200-250V AC. Size: 19 × 13 × 8¾in approx. Price: £112.51 (plus £26.49 PT).

■ **REPS**

Reps (Tape Recorders) Ltd, 11-13 Regina Road, Southall, Middlesex. Tel: 01-574 3645.

HW10 tape recorder no longer in production but spares and service available for all Reps machines from above address.

■ **REVOX**

Distributors: C. E. Hammond & Co Ltd, Lamb House, Church Street, London, W4. Tel: 01-995 4551. Telex: 934047.

**Series 77 ★**

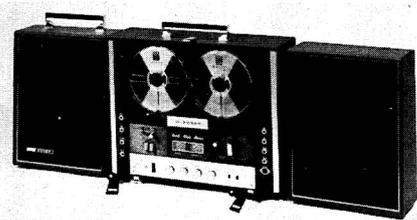
Silicon transistor stereo tape recorder available in various versions. ½-track or ¼-track. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ i/s. Max spool 10½in. W and F:  $7\frac{1}{2}$ i/s 0.08%,  $3\frac{3}{4}$ i/s 0.1%. FR:  $7\frac{1}{2}$ i/s 30Hz-20kHz + 2 - 3dB,  $3\frac{3}{4}$ i/s 30Hz-16kHz + 2 - 3dB. Record char NAB, playback char NAB and IEC (switchable). Two VU meters. Inputs: mic 0.15mV 50-600 ohms or 2mV up to 100K (switchable), radio 2mV 33K, aux 40mV 1 megohm. Outlets: line 2.5V 600 ohms, 1.2V 2.5K. Output: 8W RMS per channel. HD better than 1%. Three-motor deck electronically governed. Electronic speed change. Vertical or horizontal operation. Plug-in printed circuit modules. Oscillator frequency 120kHz. Remote control for all functions. Output impedance (power amplifiers) 4-16 ohms. 54



Revox 77



Sharp RD708V



Sharp RD711D

transistors, 32 diodes, 4 silicon rectifiers. Mains: 110, 130, 150, 220, 240, 250V 50/60Hz. Weight: approximately 34lb. Prices and variations follow.

**Model 1302 or 1304**

Chassis in metal encasement for rack mounting, no output amplifiers.  $\frac{1}{4}$  or  $\frac{1}{2}$  track. Price: £204.75. (including PT).

**Model 1322 or 1324**

As above, but with 10W output amplifiers.  $\frac{1}{2}$  or  $\frac{1}{4}$  track. Price: £236.25 (including PT).

**Model 1102 or 1104**

Chassis in teak surround, no output amplifiers.  $\frac{1}{2}$  or  $\frac{1}{4}$  track. Price: £204.75 (including PT).

**Model 1122 or 1124**

Chassis in teak surround with output amplifiers.  $\frac{1}{2}$  or  $\frac{1}{4}$  track. Price: £236.25 (including PT).

**Model 1222 or 1224**

Complete recorder in suitcase with amplifiers

and four speakers.  $\frac{1}{2}$  or  $\frac{1}{4}$  track. Price: £246.75 (including PT).

Specially modified versions incorporating NAB hubs from £161. Tax-free for industrial and scientific users only.

■ **SCOPETRONICS LTD**

Crown Works, Church Road, Kingston-upon-Thames, Surrey. Tel: 01-546 1275 and 4135.

**1151**

Stereo tape recorder. Speeds:  $7\frac{1}{2}$ , 15i/s. Max spool capacity  $11\frac{1}{2}$ in. W and F: <0.08% both speeds. H and N: -57dB. FR: 40Hz-15kHz  $\pm\frac{1}{2}$ dB (either speed). Replay char: CCIR. Level indicator: meter. Rewind time: 2,400ft in 1 min 45 sec. Inputs: microphone, -75dB 600 ohms. Line bridging, -14dB 50K. Outlets: line, up to 18dBm, 50 ohms or 600 ohms line. Monitor amp, 2W at 15 ohms. Transistorised. 3 Papst motors, with ext Rotor. Tape deck: own. Superimpose, pause and inching facilities. Straight-through amplifier. Optical stop. Psn: 250V 50Hz. Price: £450 (provisional).

■ **SHARP**

Sharp Electronics (UK) Ltd, 48 Derby Street, Manchester, M88HN. Tel: 061-832 6115.

**RD706**

Mains operated mono  $\frac{1}{4}$ -track recorder. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool: 7in. W and F:  $7\frac{1}{2}$ i/s 0.25%,  $3\frac{3}{4}$ i/s 0.3%,  $1\frac{7}{8}$ i/s 0.4%. H and N: -50 dB. FR:  $7\frac{1}{2}$ i/s 60Hz-15kHz,  $3\frac{3}{4}$ i/s 70Hz-7.5kHz,  $1\frac{7}{8}$ i/s 70Hz-4kHz. Rewind time: approx 2 min for 1,200ft. Meter level indicator. Inputs: mic 0.2mV, aux 70mV. Outlet: 8 ohms. Output: 3W. Speaker:  $7\frac{1}{2} \times 4$ in. Transistors. One motor. Sharp deck. Straight-through amplifier. Monitoring. Size:  $7\frac{1}{2} \times 15\frac{1}{2} \times 13\frac{3}{4}$ in. Weight: 22lb. Mains: 110, 200, 220, 240V 50Hz. Price: £46.91 (plus £11.59 PT).

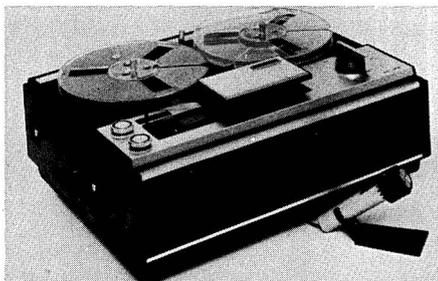
**RD708V ★**

Mains operated stereo  $\frac{1}{4}$ -track recorder. Speeds:  $7\frac{1}{2}$ - $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool: 7in. W and F:  $7\frac{1}{2}$ i/s 0.15%,  $3\frac{3}{4}$ i/s 0.2%,  $1\frac{7}{8}$ i/s 0.2%. H and N: -45 dB. FR:  $7\frac{1}{2}$ i/s 40Hz-16kHz,  $3\frac{3}{4}$ i/s 40Hz-8kHz,  $1\frac{7}{8}$ i/s 40Hz-4kHz. Replay char: DIN. Rewind time: less than 2 min for 1,200ft. Meter level indicator. Inputs: mic 0.2mV 200 ohms, aux (DIN) 5mV 15K. Outlets: line (DIN) 500mV 2K, speaker 8 ohms. Output: 3.5W RMS per channel. Speakers:  $6\frac{1}{2}$ in bass driver,  $2\frac{3}{8}$ in tweeter. Transistors. One motor. Sharp deck. Straight-through amplifier. Monitoring. Parallel track replay. Size:  $15\frac{3}{8} \times 15\frac{3}{8} \times 10\frac{1}{2}$ in. Weight: 34lb. Mains: 110, 200, 220, 240V 50/60Hz. Price: £76.18 (plus £18.82 PT).

★ Indicates entry is illustrated

### RD711D ★

Mains operated stereo  $\frac{1}{4}$ -track recorder. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool: 7in. W and F:  $7\frac{1}{2}$ i/s <0.15%,  $3\frac{3}{4}$ i/s <0.2%,  $1\frac{7}{8}$ i/s <0.2%. H and N: -45dB. FR:  $7\frac{1}{2}$ i/s 40Hz-16kHz,  $3\frac{3}{4}$ i/s 40Hz-8kHz,  $1\frac{7}{8}$ i/s 40Hz-4kHz. Replay char: DIN. Rewind time: less than 2 min for 1,200ft. Meter level indicator. Inputs: mic 0.1mV (-88dB) 200 ohms, line 5mV (-35dB) 15K. Outputs: 0.5V (-6dB) 2K, speaker 8 ohms. Output: 2.8W RMS per channel. Speakers:  $7\frac{1}{2} \times 4$ in. All transistor. Straight-through amplifier. One motor. Sharp deck. Monitoring. Parallel track replay. Size:  $15\frac{1}{2} \times 19\frac{1}{2} \times 7\frac{1}{2}$ in. Weight: 35lb. Mains: 100, 200, 220, 240V 50/60Hz. Price: £72.17 (plus £17.83 PT).



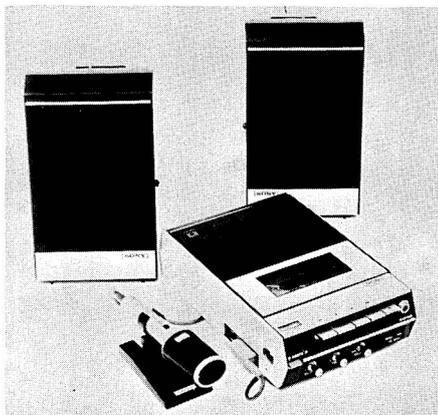
Sony TC-108

### SKANDIA ELECTRONICS

Distributors: Golding Audio Ltd, Marks Tey, Colchester, Essex. Tel: Colchester 210433.

#### RS82

Eight-track stereo cartridge recorder with output stages but less speakers. Speed:  $3\frac{3}{4}$ i/s. Eight-track 400ft cartridge. W and F: <0.3%. FR: 30Hz-12kHz. Fast forward wind at  $7\frac{1}{2}$ i/s. Twin VU meters. Inputs: mag PU 2mV, ceramic PU 160mV, aux 80mV, microphone (2). Outputs: speakers at 8 ohms per channel. Output: 3W RMS per channel. Superimpose. Pause control. Inching. Monitoring. Automatic stop at end of pre-selected programme. AC mains. Fully transistorised. One motor in tape transport. Price: £92 (plus £24.78 PT).



Sony TC-124CS

### SONY (UK) LTD

Pyrene House, Sunbury Cross, Sunbury-on-Thames. Tel: Sunbury-on-Thames 87644/7.

#### TC630

Stereo tape recorder.  $\frac{1}{4}$ -track. Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$  and  $7\frac{1}{2}$ i/s. Max spool capacity: 7in. W and F:  $7\frac{1}{2}$ i/s 0.09%;  $3\frac{3}{4}$ i/s 0.12%;  $1\frac{7}{8}$ i/s 0.16%. H and N:  $7\frac{1}{2}$ i/s -50dB. FR:  $7\frac{1}{2}$ i/s 30Hz-22kHz;  $3\frac{3}{4}$ i/s 30Hz-13kHz;  $1\frac{7}{8}$ i/s 30Hz-10kHz. Replay char: NARTB. Level indicator: meter. Rewind time: 1,200ft  $2\frac{1}{2}$  min. Inputs: microphone, -72dB (0.2mV), 250 ohms; tuner, -22dB (0.06V), 100K; aux, -22dB (0.06V), 560K. Outputs: line output 0dB (0.775V), 100K ohms; headphone, -28dB (30mV), 8 ohms; extension speakers, 8 ohms. Audio output: 15W per channel. Transistorised. Dimensions:  $20 \times 17\frac{7}{8} \times 11\frac{1}{8}$ in. Motor: capstan drive. Tape deck: own. Weight: 46lb. Superimposition. Pause. Position indicator: digital. Straight-through amplifier. Monitoring. Sound-on-sound. Echo. Three heads. Psn 100, 110, 117, 125, 220 or 240V, 50 or 60Hz. 40W. Price: £160.06 (plus £39.69 PT).



Sony TC-800B

#### TC106

Mono tape recorder.  $\frac{1}{2}$ -track. Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$  and



Sony TC-252

7½i/s. Max spool capacity: 7in. W and F: less than 0.15% at 7½i/s. H and N: better than 47dB at 7½i/s. FR: 7½i/s 40Hz-18kHz, 3¾i/s 40Hz-16kHz, 1¾i/s 50Hz-6kHz. Replay char: NARTB. Level indicator: meter. Inputs: microphone 0.195mV 600 ohms, aux 62mV 10K. Output: 8W into ext speaker or 4W into internal 4 × 6in speaker. Outlets: monitor 2.9V 8 ohms, ext speaker 2.9V 8 ohms. Features: pause, inching, monitoring, auto recording level with manual over-ride, complete with cardioid mic, dust cover and dem tape. Mains: 100, 117, 125, 220, 240V 50/60Hz. Weight: 17lb 11oz. Dimensions: 16½ × 11¾ × 7in. Price: £46.91 (plus £11.59 PT).

#### TC120

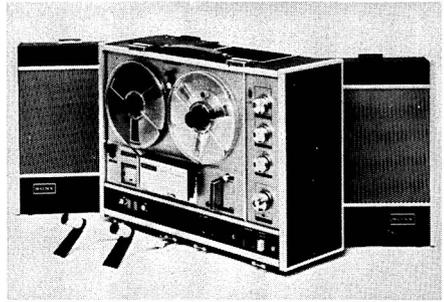
Compact cassette mono recorder. ½-track. 1¾i/s. H and N: better than 46dB. FR: 50Hz-10kHz. Replay char: NARTB. Indicator: meter for AGC. Inputs: microphone 0.195mV 600 ohms, aux 62mV 100K. Output: 1½W max into 2¾ × 4in speaker. Outlet: monitor 775mV 10K. Features: AGC recording level, built-in Electret condenser mic with 'swing balance' to minimise wow during portable use (consists of two contra-rotating flywheels). Power: four HP11 batteries or 100, 110, 120, 220, 240V 50/60Hz. Weight: 4lb 13oz. Dimensions: 10 × 5¾ × 2½in. Price: £51.09 (plus £12.66 PT).

#### TC108 ★

Mono recorder. ¼-track. 1⅞, 3¾ and 7½i/s. Max spool capacity: 7in. W and F: 0.15% at 7½i/s. H and N: better than 47dB at 7½i/s. FR: 7½i/s 40Hz-18kHz, 3¾i/s 40Hz-13kHz, 1¾i/s 50Hz-6kHz. Replay char: NARTB. Level indicator: meter. Inputs: microphone 0.195mV 600 ohms, DIN socket 6.1mV 10K. Output: 8W into ext speaker or 4W into internal 4 × 6in speaker. Outlets: ext speaker 2.9V 8 ohms, DIN socket 775mV 1K. Features: pause, inching, monitoring through speaker. Mains: 100, 110, 117, 125, 220, 240V 50/60Hz. Dimensions: 16½ × 11¾ × 7in. Price: £51.09 (plus £12.66 PT).

#### TC124 ★

Compact cassette stereo recorder. ¼-track. 1¾i/s. W and F: better than 0.28%. H and N: better than 45dB. FR: 50Hz-10kHz. Replay char: NARTB. Level indicator: meter. Inputs: 2 microphone 0.25mV 400 ohms, 2 aux 78 mV 100K. Output: 1W per channel to internal 4 × 2¾in speaker and two ext speakers. Outlets: two ext speakers 775mV 8 ohms, headphone 24.5mV 8 ohms. Features: AGC recording system, monitoring through ext speakers or line outlets, supplied with stereo mic fitted with stop/start switch and complete with int speaker and ext speakers. Power: four HP11 batteries, 100, 110, 120, 220, 240V 50/60Hz. Weight: 4lb 13oz. Dimensions: 6¾ × 9¾ × 2¾in. Price: £78.39 (plus £19.36 PT).



Sony TC-540

#### TC800B ★

Mono recorder. ½-track. 1⅞, 1⅞, 3¾ and 7½i/s. Max spool capacity: 5in. W and F: better than 0.1% 7½i/s. H and N: 48dB at 7½i/s. FR: 30Hz-18kHz 7½i/s and 30Hz-4kHz 1¾i/s. Replay char: NARTB. Level indicator: meter. Inputs: microphone 0.195mV 600 ohms, aux 62mV 100K. Output: 1W into 3½ × 6¾in speaker. Outlet: monitor 775mV 10K. Features: built-in Electret condenser microphone can be used same time as external microphone fitted with stop/start switch; speed tuning facility; AGC or manual recording with speech/music switch. Weight: 11lb 13oz. Power: eight HP2 batteries, 110, 120, 220, 240V 50/60Hz. Dimensions: 12¼ × 10¼ × 4⅞in. Price: £69.07 (plus £17.68 PT).

#### TC252 ★

Stereo recorder. ¼-track. 1⅞, 3¾ and 7½i/s. Max spool capacity: 7in. W and F: 0.12% 7½i/s. H and N: 50dB 7½i/s. FR: 30Hz-18kHz 7½i/s and 30Hz-7kHz 1¾i/s. Replay char: NARTB. Level indicator: two meters. Inputs: 2 microphone 0.195mV 600 ohms, 2 aux 62mV 100K, DIN connector 4.8mV 10K. Output: 4W per channel: speaker size 2 × 5in. Outlets: 2 line 390mV 100K, DIN connector 775mV 1K, headphone 30mV 8 ohms, 2speakers 2.7V 8 ohms. Features: speakers attach to form lid, horizontal or vertical operation, supplied with two mics; pause, inching, parallel track replay, sound-on-sound, monitoring. Mains: 100, 110, 117, 125, 220, 240V 50/60Hz. Weight: 29lb 11oz. Dimensions: 16⅞ × 15 × 10½in. Price: £80 (plus £19.75 PT).

#### TC540 ★

Stereo recorder. ¼-track. 1⅞, 3¾ and 7½i/s. Max spool capacity: 7in. W and F: less than 0.09% 7½i/s, 0.16% 1¾i/s. H and N: better than 50dB 7½i/s. FR: 30Hz-20kHz 7½i/s, 20Hz-10kHz 1¾i/s. Replay char: NARTB. Level indication: 2 meters. Inputs: 2 microphone 0.195mV 600 ohms, 2 aux 78mV 100K, DIN socket 7.8mV 10K. Output: 5W; speakers, 2 internal 4 × 8in and 2 external 4in. Outlets: 2 line 775mV 100K,

★ Indicates entry is illustrated

headphone 2.83mV 8 ohms, DIN socket 775mV 10K, 2 ext speakers 2.83V 8 ohms. Features: pause, inching, monitoring, parallel track replay, sound-on-sound, horizontal or vertical operation, four speakers. Mains: 100, 110, 117, 125, 220, 240V 50/60Hz. Weight: 41lb 10oz. Dimensions: 19 $\frac{3}{4}$  × 15 $\frac{1}{2}$  × 10in. Price: £120.10 (plus £29.65 PT).

## ■ TANDBERG

Farnell-Tandberg Ltd, 81 Kirkstall Road, Leeds, LS3 1HR. Tel: Leeds 35111.

### 1521 ★

Mono tape recorder.  $\frac{1}{2}$ -track. Speeds: 1 $\frac{7}{8}$ , 3 $\frac{3}{4}$  and 7 $\frac{1}{2}$ i/s. Max spool capacity: 7in. W and F: 0.1% 7 $\frac{1}{2}$ i/s, 0.4% 1 $\frac{7}{8}$ i/s. H and N: 52dB at 3 $\frac{3}{4}$  and 7 $\frac{1}{2}$ i/s. FR ( $\pm 2$ dB): 40Hz-18kHz 7 $\frac{1}{2}$ i/s, 50Hz-12kHz 3 $\frac{3}{4}$ i/s, 60Hz-6.5kHz 1 $\frac{7}{8}$ i/s. Rewind time: 2 min 1,200ft. Meter level indicator. Inputs: mic 0.1 mV 200 ohms, radio 10mV 100K, PU 100mV 1M. Output: 10W into 8 ohms 4 × 7in speaker. Outlets: preamp 0.9V 20K, ext speaker 10W 4 ohms, free head 2mV 20K. Features: pause, inching, straight-through amp, monitoring, input mixing, auto end stop, bass and treble controls. Weight: 19lb. Dimensions: 15 $\frac{3}{4}$  × 11 $\frac{3}{4}$  × 6 $\frac{3}{4}$ in. Price: £87 (including PT).

### 1522

Portable-case version of above. Price: £98.50 (including PT).

### 1541

$\frac{1}{4}$ -track version of 1521. Extra feature: parallel track replay. Price: £93.50 (including PT).

### 1542

Portable-case version of 1541. Price: £105.50 (including PT).

### 1521F

As 1521 but remote stop/start and rewind control. Price: £115.50 (including PT).

### 1541F

As 1521F but  $\frac{1}{4}$ -track. Price: £123.50 (including PT).

### 1521SL

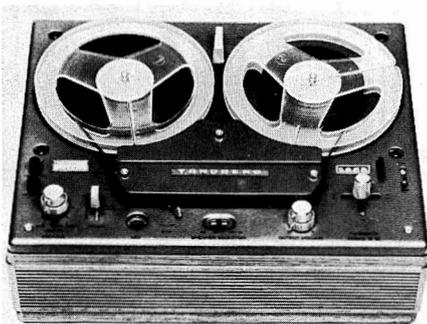
Special version for language studies with safety feature to prevent erasure of master track. Price: £121 (including PT).

### 1522SL

Portable version of 1521SL. Price: £133 (including PT).

### 11-2 ★

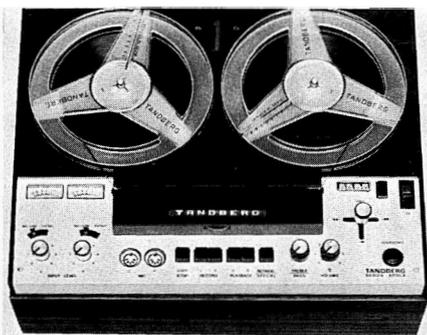
Battery-operated mono recorder.  $\frac{1}{2}$ -track. Speeds: 1 $\frac{7}{8}$ , 3 $\frac{3}{4}$  and 7 $\frac{1}{2}$ i/s. Max spool capacity: 7in. W and F: 0.1% 7 $\frac{1}{2}$ i/s, 0.2% 3 $\frac{3}{4}$ i/s, 0.3% 1 $\frac{7}{8}$ i/s. H and N: 58-52dB. FR ( $\pm 2$ dB): 40Hz-16kHz 7 $\frac{1}{2}$ i/s, 50Hz-10kHz 3 $\frac{3}{4}$ i/s, 50Hz-5.2kHz 1 $\frac{7}{8}$ i/s. Meter indicator. Rewind time: 2 min 1,200ft. Inputs: mic 100mV 200 ohms, music (1)



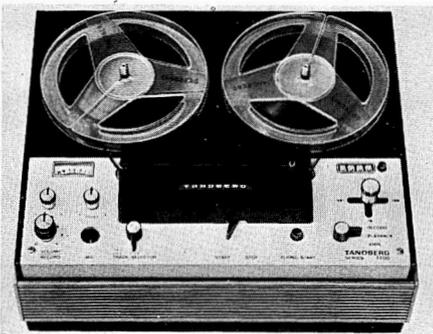
Tandberg Series 1500



Tandberg 11-2



Tandberg Series 4000



Tandberg 1741

5mV 10K, music (2) 125mV 200K. Output:  $\frac{1}{4}$ W into  $2 \times 3$ in speaker. Outlets: line 1.55V 200 ohms, speaker 20 ohms. Own pulse-excited motor. Features: off-tape monitoring, cueing in fast forward rewind, pause, inching, straight-through amp, monitoring, input mixing. Weight: 11.3lb. Dimensions:  $13 \times 10 \times 4$ in. Mains unit available. Price: £179.50 (including PT).

**11-1**

Similar to above but full track and available with or without new pilot tone facility. Price: £146 (professional users only).

**11-2M**

As 11-2 but for lip synchronization with Super 8 mm cameras. Accessories include variable speed unit, pulse generator and projector synchronizer. Price: £191 (including PT).

**1741 ★**

Mono  $\frac{1}{4}$ -track tape recorder. Speed:  $3\frac{3}{8}$ i/s. Max spool  $5\frac{3}{8}$ in. Meter level indicator. Output: 9W RMS. Speaker:  $7 \times 4$ in 8 ohms. 17-transistor circuit. Pause control. Straight-through amplifier. Monitoring. Four-digit tape position indicator. Separate bass and treble controls. AC mains. Finish: teak. Size:  $13\frac{3}{8} \times 6\frac{3}{8} \times 11$ in. Weight:  $14\frac{1}{2}$ lb. Price: £74 (including PT); type TM4 microphone £7.50 extra.

**1721**

Similar specification to 1741 but  $\frac{1}{2}$ -track. Also includes automatic stop at end of tape. Price: £69 (including PT).

**4021X ★**

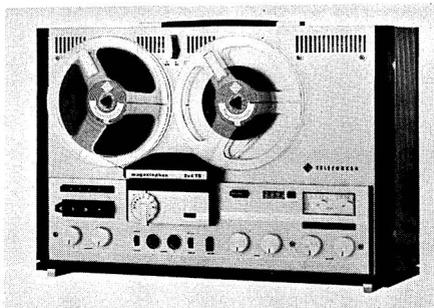
Stereo  $\frac{1}{4}$ -track tape recorder. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool 7in. W and F:  $7\frac{1}{2}$ i/s 0.07%,  $3\frac{3}{4}$ i/s 0.14%,  $1\frac{7}{8}$ i/s 0.28%. FR:  $7\frac{1}{2}$ i/s 40Hz-20kHz,  $3\frac{3}{4}$ i/s 50Hz-16kHz,  $1\frac{7}{8}$ i/s 50Hz-9kHz, all  $\pm 2$ dB. Rewind time:  $1\frac{1}{2}$  mins for 1,200ft,  $2\frac{1}{2}$  mins for 1,800ft. Meter level indicator. Inputs: mic 70 $\mu$ V (maximum input 70mV) 200 ohms, line 5mV (maximum input 15V) 50K, PU 1.5mV (maximum input 3V) 33K. Push-button equalisation to RIAA for ceramic, crystal or magnetic cartridge. Outlets: speaker 4.8 ohms, line 0.75V 5K minimum load, headphones 200 ohms minimum per channel. Output: 10W RMS per channel. Speakers:  $7 \times 4$ in. One motor. Own deck. Pause control. Straight-through amplifier. Monitoring. Input mixing. Parallel track replay. AC mains. Size:  $15\frac{1}{2} \times 6\frac{1}{2} \times 12\frac{3}{8}$ in. Weight: 20lb. Price: £144.34 (plus £35.66 PT).

**4041X**

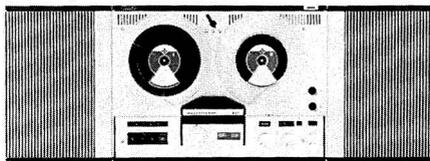
Similar specification to 4021X but  $\frac{1}{2}$ -track. Price: £144.34 (plus £35.66 PT).

**■ TELEFUNKEN**

Distributor: AEG (Great Britain) Ltd, AEG House, Chichester Rents, Chancery Lane, London, WC2. Tel: 01-242 9944.



Telefunken M204TS



Telefunken M207

**204TS ★**

$\frac{1}{4}$ -track stereo recorder. 3-speed. Max reel 7in. W and F:  $7\frac{1}{2}$ i/s 0.15%;  $3\frac{3}{4}$ i/s 0.25%;  $1\frac{7}{8}$ i/s 0.4%. H and N:  $7\frac{1}{2}$ i/s -50dB;  $3\frac{3}{4}$ i/s -48dB. FR (to DIN 45511)  $7\frac{1}{2}$ i/s 40Hz-18kHz;  $3\frac{3}{4}$ i/s 40Hz-15kHz;  $1\frac{7}{8}$ i/s 40Hz-8kHz. Replay char: DIN. Level meters (two). Inputs: mic 0.15mV 5K. Tuner 0.15mV 5K, PU/tape 70mV 2.2M. Outputs: amplifier 1.5V 8K; phones 0.5V 5K; speaker 6W 4 ohm. Speaker  $7 \times 4\frac{1}{2}$ in. Sound on sound. Pause. 4 digit counter. Straight-through amplifier. Monitor. Parallel track replay. Vertical or horizontal operation. Separate controls for each channel. Track selection switch. Warning light below each meter. Transcribe track-to-track. Psn 110-240V. Price: £100.45 (plus £24.50 PT).

**M207 ★**

Three-speed  $\frac{1}{4}$ -track recorder. Max spool: 7in. Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$ ,  $7\frac{1}{2}$ i/s. W and F:  $7\frac{1}{2}$ i/s <0.15%,  $3\frac{3}{4}$ i/s <0.25%,  $1\frac{7}{8}$ i/s <0.4%. FR:  $7\frac{1}{2}$ i/s 40Hz-18kHz,  $3\frac{3}{4}$ i/s 40Hz-15kHz,  $1\frac{7}{8}$ i/s 40Hz-8kHz. Replay char: DIN. Two level meters. H and N:  $7\frac{1}{2}$ i/s -50dB,  $3\frac{3}{4}$ i/s -45dB. Inputs: mic, radio, pickup. Outlets: headphones, speakers(2). Output: 2.5W per channel. Pause control. Four-digit tape position indicator. Straight-through amplifier. One channel monitor. Parallel track replay. Vertical or horizontal operation. Selector switch. Clear plastic cover. Separate speakers fit on back of recorder to make one unit for carrying. Mains: 110-240V AC. Price: £92.01 (plus £22.44 PT).

★ Indicates entry is illustrated

## ■ TOSHIBA

Hanimex (UK) Ltd, Hanimex House,  
15-24 Great Dover Street, London, SE1.  
Tel: 01-407 8161.

### KT41

Stereo cassette recorder including speakers. Full details and specification to be announced. Price: £119.

## ■ UHER

Distributors: Bosch Ltd, Rhodes Way,  
Radlett Road, Watford, Herts, WD24LB.  
Tel: Watford 44233.

### Uher 4200 ★

Transistorised mains/battery stereo tape recorder.  $\frac{1}{2}$ -track. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ ,  $\frac{1}{2}$  i/s. Max spool 5in. W and F:  $7\frac{1}{2}$  i/s 0.25%,  $3\frac{3}{4}$  i/s 0.25%,  $1\frac{7}{8}$  i/s 0.35%,  $\frac{1}{2}$  i/s 0.5%. H and N:  $7\frac{1}{2}$  i/s - 53 dB,  $3\frac{3}{4}$  i/s - 51 dB,  $1\frac{7}{8}$  i/s - 47 dB,  $\frac{1}{2}$  i/s - 43 dB. FR:  $7\frac{1}{2}$  i/s 40Hz-20kHz  $\pm$  3dB,  $3\frac{3}{4}$  i/s 40Hz-16kHz  $\pm$  3dB,  $1\frac{7}{8}$  i/s 40Hz-10kHz  $\pm$  3dB,  $\frac{1}{2}$  i/s 40Hz-4.5kHz  $\pm$  3dB. Replay char: NARTB. Level indicator: two meters. Rewind time: 3 mins for 900ft. Inputs: mic 0.1mV 200 ohms, radio 2mV 47K, PU 30mV 1 megohm. Outlets: line 1V 15K, speaker 4 ohms. One motor. Pause. Digital position indicator. Monitoring. Parallel track replay. Size: 11 x 3 x 8in. Weight: approx 7lb. Supply: internal dry cells, rechargeable accumulator, or from 6V, 12V, 24V car battery, 110-240V AC mains with additional adaptor units. Price: £178.50 (including PT).

### Uher 4400

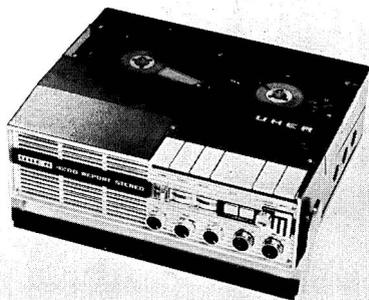
$\frac{1}{4}$ -track version of 4200. Specification almost identical. Price: £178.50 (including PT).

### Uher Royal de luxe ★

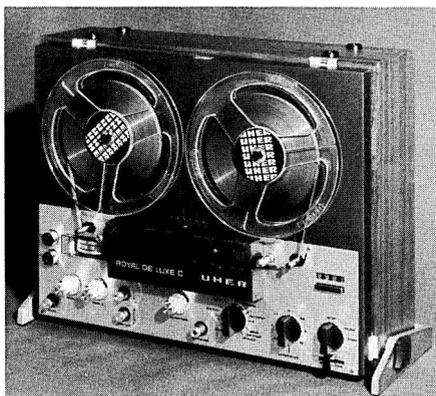
Transistorised semi-professional mains recorder. Mono/stereo.  $\frac{1}{4}$ -track or  $\frac{1}{2}$ -track. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ ,  $\frac{1}{2}$  i/s. Max spool 7in. W and F:  $7\frac{1}{2}$  i/s 0.05%,  $3\frac{3}{4}$  i/s 0.1%,  $1\frac{7}{8}$  i/s 0.25%,  $\frac{1}{2}$  i/s 0.35%. H and N:  $7\frac{1}{2}$  i/s - 54dB,  $3\frac{3}{4}$  i/s - 54dB,  $1\frac{7}{8}$  i/s - 54dB. FR:  $7\frac{1}{2}$  i/s 20Hz-20kHz,  $3\frac{3}{4}$  i/s 20Hz-15kHz,  $1\frac{7}{8}$  i/s 20Hz-9kHz,  $\frac{1}{2}$  i/s 20Hz-5kHz. Replay char: NARTB. Level indicators: two meters. Inputs: mic 0.2mV-100mV 200 ohms, radio 2 mV-1V 47K, PU(1) 50mV 1 megohm, PU(2) 200mV 50K. Outlets: line 775mV 15K, speakers 4 ohms. Output: 10W RMS per channel. One Papst motor. Pause. Inching. Straight-through amplifier. Horizontal or vertical operation. Monitoring. Input mixing. Parallel track replay. Interchangeable head assemblies available as optional extras. Dia-pilot. Multiplay. Echo. Weight: 29 $\frac{1}{2}$ lb. Price: £264.67 (including PT).

### Uher Royal de luxe (C)

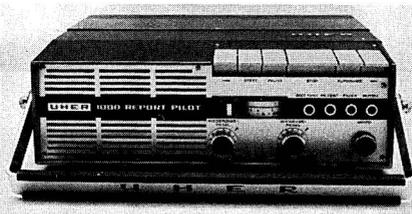
Stereo unit without power amplifiers or speakers. Specification as for Royal de luxe. Price: £233.90 (including PT).



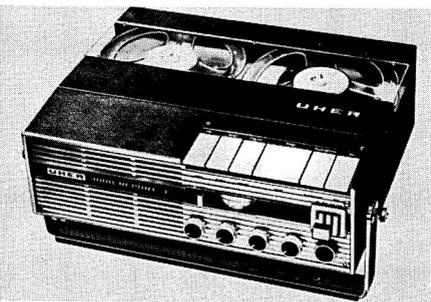
Uher 4200 Stereo



Uher Royal de Luxe



Uher 1000 Report Pilot



Uher 4000 Report L

**Uher Pilot 1000 ★**

Transistorised professional mains/battery mono recorder. Full track. Speed:  $7\frac{1}{2}$ i/s. Max spool 5in. W and F 0.2%. H and N 52dB. FR 20Hz-20kHz  $\pm 3$ dB. Replay char: CCIR, NARTB. Meter level indicator. Rewind time 3 mins 900ft. Inputs: mic 0.3mV 200 ohms balanced, 1-10V line. Output 1W RMS. 600 ohm balanced line, pilot tone to synchroniser. Brushless DC motor. Pause. Digit tape indicator. Straight-through amplifier. A/B monitoring. Neo-pilot tone input for synchronising sound with film camera. Supply: internal dry cells, rechargeable accumulator, or from 6V, 12V, 24V car battery, 110-240V AC mains with additional adaptor units. For supply only to industrial or scientific users. Size:  $11 \times 3 \times 8$ in. Weight: 7lb. Price: £322.50 (special prices available to industrial and professional users).

**Accessory**

Scene marker module No. 9045. Price: £9.20.

**4000 Report L ★**

Transistorised mono battery portable recorder.  $\frac{1}{2}$ -track. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ ,  $1\frac{1}{2}$ i/s. W and F  $7\frac{1}{2}$ i/s,  $\pm 0.2\%$ . H and N 55dB. FR:  $7\frac{1}{2}$ i/s 40Hz-20kHz,  $3\frac{3}{4}$ i/s 40Hz-16kHz,  $1\frac{7}{8}$ i/s 40Hz-10kHz,  $1\frac{1}{2}$ i/s 40Hz-4.5kHz. All  $\pm 3$ dB. Replay char: NARTB. Inputs: mic 0.1mV 200 ohms, radio 2mV, 47K; gram 30mV, 1 megohm. Outlet direct from pre-amp. One motor. 5in spool. Supply: internal batteries, rechargeable accumulator, or from 6V, 12V, 24V car battery or 110/240V AC mains with additional adaptor units. Size:  $11 \times 3 \times 8$ in. Weight: approx 7lb. Price: £141.57 (including PT). Combined mains unit and battery charger type Z124. Price: £17.73 (including PT).

**Variocord ★**

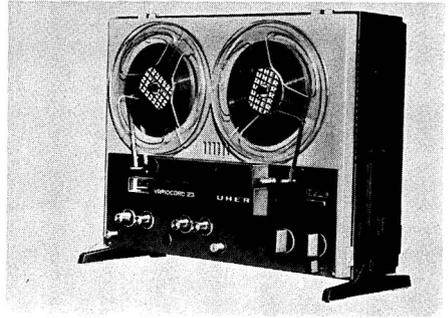
Transistorised mains mono recorder. Available as  $\frac{1}{2}$ -track or  $\frac{1}{4}$ -track. Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$  and  $7\frac{1}{2}$ i/s. W and F at  $7\frac{1}{2}$ i/s 0.05%. FR  $7\frac{1}{2}$ i/s 30Hz-20kHz;  $3\frac{3}{4}$ i/s 30Hz-15kHz;  $1\frac{7}{8}$ i/s 30Hz-8kHz. Inputs: mic 0.12mV (200 ohms); radio 1.2mV; gram 45mV. Outputs: line 1.4V; speaker 2W or 6W (depending on type) into 4 ohms. Level indicator meter. Interchangeable head assemblies. Input mixing. Horizontal or vertical operation. Optional 2W or 6W output stages. Optional add-on automatic volume control module. Prices from £116.95 (including PT).

**Variocord Stereo**

Same specification as Variocord but with twin 6W amplifiers.  $\frac{1}{4}$ -track or  $\frac{1}{2}$ -track. Price: £160.03 (including PT).

**Uher 714 ★**

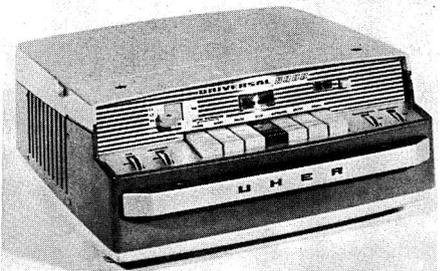
Mains mono  $\frac{1}{2}$ -track recorder. Max spool 7in. Speed:  $3\frac{3}{4}$ i/s. W and F 0.3%. S/N >48dB. Inputs: mic 200 ohms, radio 47K, PU 1 megohm.



*Uher Variocord 23*



*Uher 714*



*Uher Universal 5000*

Output: 2W. Meter level indicator. Monitor facility. Auto shut-off at end of tape. Price: £55.40 (including PT).

**Uher 5000 Universal ★**

Mains  $\frac{1}{2}$ -track mono recorder. Speeds:  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ ,  $1\frac{1}{2}$ i/s. FR 40Hz-15kHz  $\pm 3$ dB at  $3\frac{3}{4}$ i/s. Max spool: 5 $\frac{1}{2}$ in. W and F:  $3\frac{3}{4}$ i/s  $\pm 0.2\%$ . Inputs: mic 200 ohms, radio 47K, PU 1 megohm. Solenoid operation for remote control working. All metal case. Large range of dictation and transcription accessories available. Price: £145.26 (including PT).

**5000 Language Tutor**

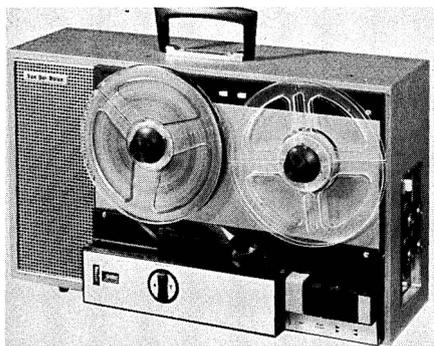
Specification as for 5000 Universal except



Uher 724 Stereo



Uher Cassette Report



Van Der Molen VR47

double  $\frac{1}{2}$ -track heads and  $3\frac{3}{4}$ i/s speed only. Top track playback only, lower track record and playback. Price: £125.

**Uher 724 Stereo ★**

Transistorised stereo mains recorder.  $\frac{1}{2}$ -track. Speeds:  $3\frac{3}{4}$ ,  $7\frac{1}{2}$ i/s. W and F:  $7\frac{1}{2}$ i/s 0.2%,  $3\frac{3}{4}$ i/s 0.25%. FR:  $7\frac{1}{2}$ i/s 50Hz-20kHz,  $3\frac{3}{4}$ i/s 50Hz-15kHz. Inputs: mic 0.25mV 200 ohms, radio 4.7mV 47K, PU 130mV 1 megohm. Outputs: line 0.7V 4.7K, speaker (2) 2W each into 4 ohms. Level indicator meter. Monitoring via phones or speaker. Vertical or horizontal operation. Price: £121.87 (including PT).

**Uher Cassette Report ★**

(Advance information.) Transistorised battery cassette stereo recorder. Speed:  $1\frac{7}{8}$ i/s. Compact cassette. W and F: approx 0.2%. FR: 40Hz-10kHz approx. Inputs: mic 200 ohms, radio or PU. Outputs: two line, two ext speakers (1W into 4 ohms). Meter for battery check and record level. Manual or automatic record level. Switchable built-in mic for reporting, etc. Twin-stacked stereo head assembly. Remote control for tape transport. Three-digit tape counter. Monitoring via built-in or external speaker or phones. Supply: internal batteries, rechargeable accumulator, or from 6V, 12V, 24V car battery, 110/240V AC mains via adaptors. Price: to be announced.

**■ VAN DER MOLEN LTD**

1 Mildmay Road, Romford, Essex, RM77DA.  
Tel: Romford 41904.

**VR47 ★**

Recorder. Three-speed  $\frac{1}{2}$ -track. Max spool: 7in. Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$ ,  $7\frac{1}{2}$ i/s. W and F:  $7\frac{1}{2}$ i/s 0.15%,  $3\frac{3}{4}$ i/s 0.25%,  $1\frac{7}{8}$ i/s 0.35%. H and N: better than 40dB all speeds. FR:  $7\frac{1}{2}$ i/s 60Hz-15kHz,  $3\frac{3}{4}$ i/s 60Hz-10kHz,  $1\frac{7}{8}$ i/s 60Hz-4kHz. Replay char: CCIR. VU meter. Rewind time: 3 mins for 1,200ft. Inputs: mic 2mV into 1 megohm, radio 200mV into 1 megohm. Outlets: 1-3V 200K, ext speaker 10W 4 ohms. Speaker: rear-facing 8in. Pause control. Tape position indicator. Straight-through amplifier. Monitoring. Mixing. Vertical operation. Mains: 200-250V AC. Size:  $18\frac{3}{4} \times 11\frac{1}{2} \times 7$ in. Weight: 21lb. Price: £53.90 (plus £13.31 PT).

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The N2503 Stereo Cassette Deck. You use it in conjunction with your existing amplifier and speakers to record and play back cassettes in stereo and to play pre-recorded Musicassettes of your favourite artists.

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extremely fast wind/rewind time, a very impressive signal to noise ratio, a sliding recording level control and a recording level indicator. It comes complete with a moving coil stereo microphone, and is also a very handsome piece of equipment, designed to look good in any hi-fi system, with real rosewood sides and a silver colour front plate.

The N2503 Stereo Cassette Deck. We think that no hi-fi system is complete without it.

We want you to have the best.

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If you are unable to call personally, please write to us at 3-15, Cavell St., London, E.1. and we will be pleased to send our quotation for your equipment requirements ; and remember, "Lasky's Package Deal Plan" offers you the opportunity of obtaining a worthwhile cash saving when you purchase a complete system.

#### *High Fidelity Audio Centres*

**42-45 Tottenham Court Road, London, W.1. Tel. : 01-580 2573**

#### *Branches*

**207 Edgware Road, London, W.2.**

**Tel. : 01-723 3271**

**33 Tottenham Court Road, London, W.1.**

**Tel. : 01-636 2605**

**109 Fleet Street, London, E.C.4.**

**Tel. : 01-353 5812**

**152/3 Fleet Street, London, E.C.4.**

**Tel. : 01-353 2833**

**ALL MAIL ENQUIRIES TO:—**

**3-15 Cavell Street, London, E.1.**

**Tel. : 01-790 4821**

# Laskys

# Tape Decks

★ Indicates entry is illustrated

Tape decks are defined as mechanical transport systems, with or without heads, but excluding preamplifiers, oscillators or other electronics. The abbreviations used in this section are given on page 46.

## ■ BRENELL ENGINEERING CO LTD

231/5 Liverpool Road, London, N1.  
Tel: 01-607 8251 (5 lines).

### Mark 5 Series 3

G.P. tape deck, 15, 7½, 3¾ and 1⅞i/s. Three motors. 8¼in spools. W and F 0.1% at 7½i/s. Accommodates up to four heads. Size: 15 × 11½ × 5in. Weight: 16lb. Price: (less heads) £45-10 (plus £11-29 PT); (with two heads) £49-95 (plus £12-50 PT).

### Mark 510 Series 3

Deck mechanism. ½- or ¼-track. Speeds: 15, 7½, 3¾, 1⅞i/s. W and F: 15i/s, <0.05%; 7½i/s, <0.1%; 3¾i/s, <0.15%; 1⅞i/s, <0.25%. Three motors (synchronous type for capstan). 10½in. NAB spools, 60 secs per 1,200ft rewind. Pause. Accommodates 4 heads. Size: 15 × 11½ × 6in. Weight: 16lb. Price: (less heads) £59-10 (plus £14-79 PT). (Prices with heads on application.)

### Mark 6 ★

Four-speed three-motor with provision for up to four heads. Speeds: 15, 7½, 3¾, 1⅞i/s. W and F 15i/s <0.05%, 7½i/s <0.1%, 3¾i/s <0.15%, 1⅞i/s <0.25%. All motors outer rotor type (hysteresis synchronous or capstan drive). Max spool 8¼in. Rewind time: 60 seconds for 1,200ft. Four-digit tape indicator. Erase head low impedance, record/playback heads high impedance. Horizontal or vertical mounting. Record/playback switches fitted with extended spindles to accommodate extra wafers. Finish: blue/grey. Size: (deck) 15 × 11½in; (depth below) 5in approx; (overlap with 8¼in spools) 1½in at rear and 1in at each side. Mains: 200-250V 50Hz (110-120V 60Hz to order). Weight: 18lb. Price: (less heads) from £47-85 (plus £11-98 PT).

### Mark 610

Modified Mark 6 deck designed to take 10½in NAB spools. Full details and prices on request.

## ■ FERROGRAPH CO LTD

The Hyde, Edgware Road, Colindale,  
London, NW9. Tel: 01-205 2241.

## Series 7

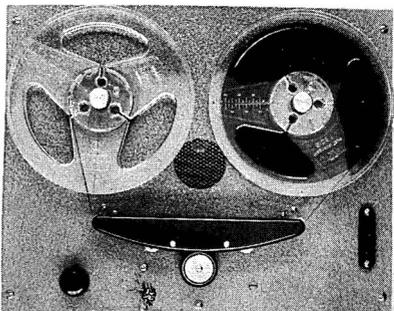
Semi-professional tape deck. Speeds: 15, 7½, 3¾i/s or 7½, 3¾, 1⅞i/s. Mono or stereo. ½-track or ¼-track. Max spool 8¼in. W and F 0.08% at 15 i/s, 0.08% at 7½i/s, 0.15% at 3¾i/s, 0.2% at 1⅞i/s. Rewind time: less than one minute for 1,200ft. Three motors, synchronous hysteresis capstan motor, shaded pole reel motors. Pause facility. Single knob control. Vertical or horizontal operation. Fast wind continuously variable in either direction. Remote start/stop facility. Removable head block. Automatic stop at end of reel. Reel retainers fitted to spindles. Various head arrangements. Full specification and prices on application.

## ■ PLANET PROJECTS LTD

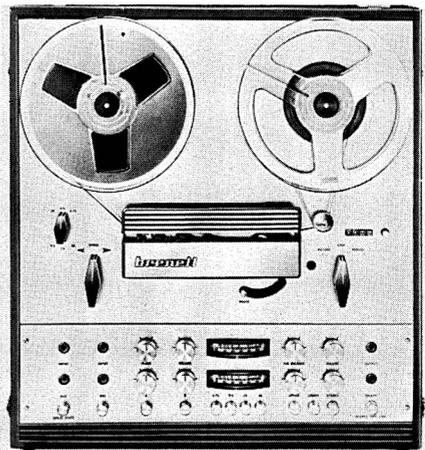
Goodman Works, Belvue Road, Northolt,  
Middlesex. Tel: 01-845 1775.

### C.D.2 ★

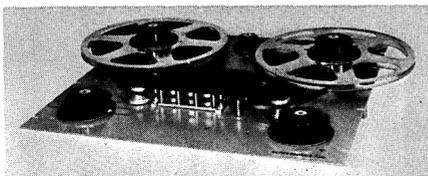
Tape deck. Speed: 3¾i/s (1⅞i/s to special order). W and F: less than 0.2% at both speeds. Mini-



Planet CD2



Brenell Mk 6



**Scopetronics 1150**  
flux heads.  $\frac{1}{2}$ -track mono or  $\frac{1}{4}$ -track stereo. Two heads, one for each track. FR: dependent on speed and heads. Papst hysteresis motor. Spool size 7in. Automatic track change and reversal of tape direction at end of spool, no fast rewind required. Uses standard  $\frac{1}{2}$ in tape. Single knob control. Provides over 8 $\frac{1}{2}$  hours uninterrupted playing at 1 $\frac{1}{4}$ i/s. Mains 220-230V 50Hz. Size: 14 $\frac{3}{4}$  × 11 $\frac{3}{4}$  × 6in. Weight approximately: 10lb. Price on application.

■ **SCOPETRONICS LTD**

Crown Works, Church Road, Kingston-upon-Thames, Surrey. Tel: 01-546 1275 and 4135.

**1150 ★**

G.P. tape deck 15, 7 $\frac{1}{2}$ i/s. Three Papst motors with ext rotors. Three heads. W and F: 0.14% at 7 $\frac{1}{2}$ i/s, 0.08% at 15i/s. Spool capacity: 11 $\frac{1}{2}$ in. Pause control and inching facility. Rewind: < 1 min 45 sec for 2,400ft. Weight: 26lb. Price: approximately £160.

■ **TAPE RECORDER DEVELOPMENTS LTD**

Hall Lane, Walsall Wood, Staffs.  
Tel: Brownhills 5351.

**TRD.1 Series 600**

Four-speed mono or stereo tape decks. W and F 15i/s 0.05%, 7 $\frac{1}{2}$ i/s 0.08%, 3 $\frac{3}{4}$ i/s 0.13%, 1 $\frac{7}{8}$ i/s 0.2%, 1 $\frac{1}{8}$ i/s 0.35%. Mains operated.  $\frac{1}{4}$ - or  $\frac{1}{2}$ -track. Accommodation for four Bogen heads. Drive motors: Papst hysteresis synchronous. Rewind motors: Papst R.O.T. Spool capacity: 3in cine to 10 $\frac{1}{2}$ in NAB. Four-digit tape position indicator. Silicon transistor tape pre-amplifier/oscillator unit available (see Tape Units section).

**TRD.1/S**

Specification as above. Speeds: 7 $\frac{1}{2}$ , 3 $\frac{3}{4}$ , 1 $\frac{7}{8}$ , 1 $\frac{1}{8}$ i/s. Solenoid operation.

**TRD.1/S/15**

Specification as above. Speeds: 15, 7 $\frac{1}{2}$ , 3 $\frac{3}{4}$ , 1 $\frac{7}{8}$ i/s. Solenoid operation.

**TRD.1/S/30**

Specification as above. Speeds: 30, 15, 7 $\frac{1}{2}$ , 3 $\frac{3}{4}$ i/s. Solenoid operation.

**TRD.1/S/60**

Specification as above. Speeds: 60, 30, 15, 7 $\frac{1}{2}$ i/s. Solenoid operation. Prices: (without heads) £129; (heads) £25 each. Supplied to professional and scientific users only free of tax.

# 8 TRACK Tape Players



# GOLDING AUDIO LTD

MARKS TEY · COLCHESTER

Tel: COL. 210433

# Tape Units

head. Size:  $15 \times 6\frac{1}{4} \times 11\frac{1}{2}$ in. Weight:  $15\frac{3}{4}$ lb. Pause control. Mains: 100-240V 50/60Hz. Price: £88.75 (plus £22.22 PT).

## X200D

Three-speed stereo tape unit.  $\frac{1}{4}$ -track. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. 15i/s optional. W and F:  $7\frac{1}{2}$ i/s 0.08%,  $3\frac{3}{4}$ i/s 0.12%,  $1\frac{7}{8}$ i/s 0.20%. H and N: -50dB at all speeds. Max spool 7in. FR:  $7\frac{1}{2}$ i/s 30Hz-26kHz  $\pm 3$ dB,  $3\frac{3}{4}$ i/s 30Hz-19kHz  $\pm 3$ dB,  $1\frac{7}{8}$ i/s 30Hz-9kHz  $\pm 3$ dB. Replay char: NARTB. Rewind time:  $1\frac{1}{4}$  minutes for 1,200ft. VU meter. Inputs: mic 0.5mV, line 50mV, DIN (low) 5mV, DIN (high) 50mV. Outlets: line 1.23V (0 VU), DIN 0.4V, stereo phones. Three motors (one three-speed synchronous, two outer rotor). Own deck. Pause, Headphone monitoring. Input mixing. Crossfield head. Auto reverse. Size:  $14 \times 14 \times 8\frac{7}{8}$ in. Weight:  $37\frac{1}{2}$ lb. Mains: 100-240V 50/60Hz. Price: £151.95 (plus £38.03 PT).

★ Indicates entry is illustrated

Tape units are defined as mechanical transport systems including heads, erase/bias oscillators and record/playback amplifiers, but excluding power output stages and speakers. Abbreviations used in this section are given on page 46.

## ■ AKAI

UK Distributors: Rank Audio Products, P.O. Box 70, Great West Road, Brentford, Middlesex. Tel: 01-568 9222. Telex: 24408.

### 4000D ★

Stereo tape unit with pre-amplifiers.  $\frac{1}{4}$ -track. Speeds:  $3\frac{3}{4}$  and  $7\frac{1}{2}$ i/s. Max spool capacity: 7in. W and F:  $7\frac{1}{2}$ i/s 0.15%;  $3\frac{3}{4}$ i/s 0.2%. H and N: 50dB. FR:  $7\frac{1}{2}$ i/s 30Hz-22kHz  $\pm 3$ dB;  $3\frac{3}{4}$ i/s 30Hz-16kHz  $\pm 3$ dB. Replay char: NARTB. Level indicator: Meter. Rewind time: 1,200ft 150 secs. Inputs: microphone, 0.5mV, 50K; line, 50mV; DIN, 50mV. Outlets: line, DIN, headphone. Transistorised. Induction motor. Tape deck: own. Dimensions:  $12\frac{3}{8} \times 15\frac{7}{8} \times 7\frac{1}{2}$ in. Weight: 25.3lb. Pause. Position indicator: digit. Monitoring: A-B. Parallel track replay. One micron gap recording head. Sound on sound. Auto stop. Auto shut off. Tape cleaner. Vertical or horizontal operation. Psn 100-240V. Price: £71.95 (plus £18 PT).

### CR80D

Stereo cartridge tape unit with preamplifiers. Eight-track. Speed:  $3\frac{3}{4}$ i/s. W and F: 0.25%. H and N: -47dB. FR: 50 Hz-16kHz  $\pm 3$ dB. Replay char: NARTB. Fast forward: 230 seconds for 300ft. VU meters (2). Inputs: mic 0.5mV, line 50mV. Outlets: line, DIN. Recording indicator lamp. Own tape transport. Headphone socket. One micron gap head. Size:  $13\frac{1}{2} \times 5\frac{1}{2} \times 10$ in. Weight: 17lb. Mains: 100-240V 50/60Hz. Price: £76 (plus £19.02 PT).

### CS50D

Stereo cassette tape unit with preamplifiers.  $\frac{1}{4}$ -track compact cassette. Speed:  $1\frac{7}{8}$ i/s. W and F: 0.2%. H and N: -45dB. FR: 30Hz-16kHz. Replay char: NARTB. Rewind time: 75 seconds for C60. Two VU meters. Inputs: mic 0.2mV 4.7K, DIN 3mV 25K, line 220K. Outlets: 1.3V 10K, DIN 0.4V, headphones 8 ohms. Own tape transport. Outer rotor synchronous motor. Monitoring by headphones. One micron gap

## ■ AMPEX (GB) LTD

Acre Road, Reading, Berks RG20QR. Tel: Reading 84411.

Full range of professional and semi-professional tape decks, tape units and complete recorders. Typical specification includes following facilities. Full-, half- or quarter track on  $\frac{1}{2}$ in tape. Up to 15in spools. Speeds: selectable pairs from  $\frac{1}{8}$ ,  $1\frac{7}{8}$ ,  $3\frac{3}{4}$ ,  $7\frac{1}{2}$ , 15. Unidirectional or bi-directional operation. FR: 15i/s 30Hz-18kHz  $\pm 3$ dB,  $1\frac{7}{8}$ i/s 40Hz-10kHz. Crosstalk rejection: better than 60dB at 1kHz. Bias/erase frequency: 100 kHz. W and F: 15i/s 0.1%,  $1\frac{7}{8}$ i/s 0.25%. Start time: operating speed obtained in 0.1 second or less. Stop time: at 15i/s tape moves 3in. S/N: 15i/s half-track 63dB,  $7\frac{1}{2}$ i/s half-track 63dB,  $3\frac{3}{4}$ i/s half-track 58dB.

Supplied to professional and scientific orders only free of tax. Further details of models and specifications on request.

## ■ BANG & OLUFSEN UK LTD

Eastbrook Road, Gloucester GL47DE. Tel: Gloucester 21591.

### Beocord 1200

Stereo tape unit with preamplifiers and mixer.  $\frac{1}{4}$ -track. Speeds:  $3\frac{3}{4}$  and  $7\frac{1}{2}$ i/s. Max spool: 7in. W and F:  $3\frac{3}{4}$ i/s <0.2%;  $7\frac{1}{2}$ i/s <0.15%. H and N:  $3\frac{3}{4}$ i/s > -50dB;  $7\frac{1}{2}$ i/s > -50dB. FR: (DIN 45-500 spec)  $3\frac{3}{4}$ i/s 40 Hz-16kHz;  $7\frac{1}{2}$ i/s 30Hz-20kHz. Replay char: DIN. Rewind time: 3min 20secs for 1,800ft. VU meter level indicator. Inputs: mic (2) 80 $\mu$ V 50-200 ohms, radio 2.5mV 47K, PU 60mV 470K. Outlets: line 1V 25K, phones up to 6V 100 ohms. All transistor. Own deck. Papst outer rotor motor. Superimpose. Pausecontrol. Straight-through amplifier. Moni-

★ Indicates entry is illustrated

toring (A only). Input mixing (limited). Parallel track replay. Photo-electric automatic stop. Electronic speed change. Horizontal or vertical operation. Can be wall mounted. Mains: 110, 130, 220, 240V AC 50Hz. Finish: teak or rosewood. Price: (teak) £108.75 (including PT); (rosewood) £109.75 (including PT).

### ■ BELL & HOWELL LTD

Alperton House, Bridgewater Road, Alperton, Middlesex, HA0 1EG. Tel: 01-902 8812. Telex: 261378.

#### Design 1700 ★

Mains operated  $\frac{1}{2}$ -track stereo tape unit incorporating Dolby B noise reduction system. Compact cassettes. Speed:  $1\frac{7}{8}$ i/s. W and F: 0.2% total. H and N: better than 50dB. FR: 20Hz-12kHz  $\pm 3$ dB. Rewind time: <120 sec for C120 cassette. Twin VU meters. Inputs: microphone 0.2mV 200 ohms; aux 100mV 100K. Outlet: variable 0-1V at 5K. One DC motor. Pause control. Selector for standard magnetic tape or chromium dioxide. Automatic stop at end of tape. Size:  $14\frac{1}{2} \times 4\frac{3}{4} \times 9$ in. Weight: 8lb. Mains: 220-240V AC. Price: £86 (plus £20.50 PT).

### ■ BRENNELL ENGINEERING CO LTD

231/5 Liverpool Road, London, N1. Tel: 01-607 8271 (5 lines).

#### STB2

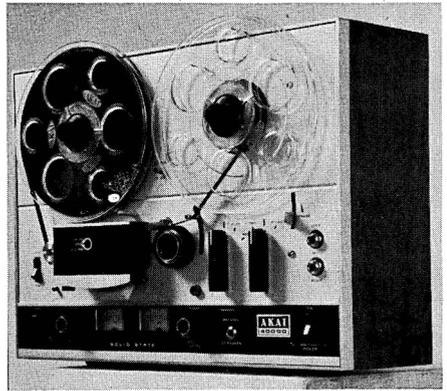
Stereo/mono deck mechanism with preamplifiers. 2/2 and 2/4 playback heads. Speeds: 15,  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. W and F: 15i/s, <0.05%;  $7\frac{1}{2}$ i/s, <0.1%;  $3\frac{3}{4}$ i/s, <0.15%;  $1\frac{7}{8}$ i/s, 0.25%. Outlet from pre-amp. Three motors.  $8\frac{1}{4}$ in or  $10\frac{1}{2}$ in NAB spools to order. Two illuminated level meters. Twin record and replay pre-amps. Tape monitoring facilities. Price: ( $8\frac{1}{4}$ in spools) £165 (plus £41.29 PT); ( $10\frac{1}{2}$ in spools) £187 (plus £46.80 PT).

#### STB2

Monitor amplifier for use with STB2 tape unit. 3W per channel. Response 40Hz-25kHz  $\pm 3$ dB. Noise level -60dB. Input: 1V for 3W output. Transistorised. Bass and treble controls. Output impedance 15 ohms. Complete with two 3 x 3in speakers. Price: £30 (plus £7.51 PT).

#### Mk 6 Stereo Unit

Stereo tape unit with preamplifiers. Twin 2/2 or quarter 2/4 track system. Speeds: 15,  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool:  $8\frac{1}{4}$ in. W and F: 15i/s 0.05%,  $7\frac{1}{2}$ i/s 0.08%,  $3\frac{3}{4}$ i/s 0.1%,  $1\frac{7}{8}$ i/s 0.12%. S/N: 56dB below 2% distortion levels of recording. FR: 15i/s 40Hz-22kHz  $\pm 3$ dB,  $7\frac{1}{2}$ i/s 40Hz-20kHz  $\pm 3$ dB,  $3\frac{3}{4}$ i/s 50Hz-14kHz  $\pm 3$ dB,  $1\frac{7}{8}$ i/s 60Hz-7kHz  $\pm 3$ dB. Two illuminated edge-scale meters. Rewind time: less than 60 seconds for



Akai 4000D



Bell & Howell 1700

1,200ft. Inputs: mic 200 $\mu$ V 200-600 ohms, aux (1) 8mV 50K, aux (2) 8mV 50K. Output: two at 1.4V from tape recorded to 0dB meter level. Two output jack sockets on front panel, two phono sockets on rear. Horizontal or vertical operation. Three motors (all outer rotor). Three heads. Pause control (lockable). Four-digit tape indicator. Auto-stop. A/B switching. A/B balance. Mains: 115, 210, 240V AC 50Hz. Size:  $17\frac{1}{2} \times 16\frac{3}{4} \times 8$ in. Weight: 33lb. Price: £152.65 (plus £38.20 PT).

### ■ CHILTON

Magnetic Tapes Ltd, Chilton Works, Garden Road, Richmond, Surrey. Tel: 01-876 7957.

#### Chilton 100S

Transistorised stereo  $\frac{1}{4}$  or  $\frac{1}{2}$ -track three-speed recorder available as portable with in-built speakers (model 100S/CAP), or chassis in teak surround without power amplifiers (100S/CW), or with power amplifiers (100S/CAW). Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$ ,  $7\frac{1}{2}$ i/s. 7in reels. Rewind time: 150 secs for 1,800ft. Deck uses hysteresis motor and four DC-operated diode-suppressed solenoids. W and F: 0.1% at  $7\frac{1}{2}$ i/s, 0.25% at  $1\frac{7}{8}$ i/s. FR: ( $\pm 2$

dB) via tape 30Hz-18kHz ( $7\frac{1}{2}$ i/s), 40 Hz-11 kHz ( $3\frac{3}{4}$ i/s) and ( $\pm 3$ dB) 50Hz-7kHz ( $1\frac{7}{8}$ i/s). Signal/noise, unweighted, 50dB  $\frac{1}{4}$ -track and 53 dB  $\frac{1}{2}$ -track, all speeds. Replay char: IEC (NAB to order). Inputs per channel: mic 600 ohms-50K 0.4mV, radio 100K 40mV (DIN), gram 47K 1mV RIAA DIN. Outlets: line 2K 0.5V DIN, radio 10K 0.25V DIN, speakers (models with power amps) 10W at 8 ohms. LS impedance 4-16 ohms. Two  $6 \times 4$ in units per channel in model. CAP. Stereo headphone jack socket. Size: (portable with lid)  $14\frac{1}{2} \times 13\frac{3}{8} \times 6\frac{1}{2}$ in; (chassis)  $19 \times 16 \times 8$ in. Prices: (100S/CW—tape unit in teak surround for use with external amplifier. Output 0-3V at 600 ohms) £122 (plus £30-13 PT); (100S/CAW—with two 10W amplifiers and tone controls for use with external speakers) £132 (plus £32-40 PT); (100S/CAP—as CAW but in leatherette covered case with four inbuilt speakers) £140 (plus £34-58 PT); (200S/CAP—teak portable with four inbuilt speakers and transparent plastic lid) £150 (plus £37-05 PT).

#### Extras

Two-track version £10 (plus £2-47 PT); lockable teak case and cover for type CW £6 (plus £1-48 PT); modifications for vertical operation £12 (plus £2-96 PT).

### ■ CROWN INTERNATIONAL

Distributor: Carston Electronics Ltd,  
71 Oakley Road, Chinnor, Oxon.  
Tel: 0844 52061.  
London office: Shirley House, 27 Camden Road,  
London, NW1. Tel: 01-267 2748.

#### 800 Series

Stereo unit.  $\frac{1}{4}$ - or  $\frac{1}{2}$ -track. Three speed 15i/s or  $1\frac{1}{8}$ i/s optional. Max reel  $10\frac{1}{2}$ in. W and F: 15i/s 0.06%;  $7\frac{1}{2}$ i/s 0.09%;  $3\frac{3}{4}$ i/s 0.18% (RMS). H and N: 15i/s -60dB;  $7\frac{1}{2}$ i/s -60dB;  $3\frac{3}{4}$ i/s -55dB (below peak level). FR ( $\pm 2$ dB): 15i/s 30Hz-30kHz;  $7\frac{1}{2}$ i/s 30Hz-25kHz;  $3\frac{3}{4}$ i/s 30 Hz-15kHz. Replay char: CCIR. VU meter. Rewind time: 58 secs 2,400ft, 38 secs 1,200ft. Inputs: 2 mixable inputs per channel, mic or line. Sensitivity: 45mV for 0 level (line), 0.4mV for 0 level (mic); impedance 100K, balanced or unbalanced 600 ohms, or 50/200 ohms. Output: 600 ohms. Three motors, magnetic brakes, logic circuitry for tape handling, all tape commands can be remote. A-B monitoring, source and tape mixing, echo, individual bias adjustment and metering. Size  $17\frac{1}{2} \times 19 \times 8$ in. Weight: 50lb. Price: £700 to £1,500.

### ■ DUAL ELECTRONICS LTD

St Georgen House, Mill Road, Stokenchurch,  
High Wycombe, Bucks. Tel: Radnage 3467/8.

### CTG29

Two-speed  $\frac{1}{4}$ -track stereo tape unit. Speeds:  $3\frac{3}{4}$ ,  $7\frac{1}{2}$ i/s. W and F:  $7\frac{1}{2}$ i/s  $\pm 0.1\%$ ,  $3\frac{3}{4}$ i/s  $\pm 0.15\%$ . FR:  $7\frac{1}{2}$ i/s 30Hz-20kHz,  $3\frac{3}{4}$ i/s 30Hz-14kHz (DIN 45 507). Max spool: 7in. Rewind time:  $3\frac{1}{2}$  mins 1,750ft. Two illuminated VU meters. Pause control. Emergency stop (not dependent on stop foil). Finish: walnut base with smoked plexiglass cover. Horizontal or vertical operation. Mains: 110, 130, 220, 250V AC. Size:  $16\frac{1}{2} \times 7\frac{1}{2} \times 14\frac{7}{8}$ in. Price: to be announced.

### ■ HARMAN-KARDON

Distributors: Highgate Acoustics Ltd,  
184-188 Great Portland Street, London, W1.  
Tel: 01-636 2901.

### CAD5

Stereo cassette tape unit incorporating the Dolby B noise reduction system.  $\frac{1}{4}$ -track compact cassettes. Speed:  $1\frac{7}{8}$ i/s. W and F: 0.15%. S/N: better than 50dB at zero VU. FR: 30Hz-12.5 kHz  $\pm 2$ dB. Twin VU meters. Inputs: 200mV  $\pm 2$ dB for zero VU. Input impedance: 200K. HD:  $< 1.5\%$ . Tape speed variation: within 1%. Bias oscillator frequency: 105kHz. Crosstalk: 40dB. Erasure: better than 55dB. Output: 1-0V. Size:  $12\frac{1}{2} \times 9 \times 3\frac{1}{4}$ in. Weight: 10lb. Tape position indicator with pushbutton reset. Pushbutton function switches. Slider type level controls (one for each channel). Mains on-off switch. Dolby in-out switch. Indicator light to show Dolby in. Indicator light to show modulation level overload. Indicator light to show motor on. Indicator light for record. Stereo/mono microphone switch. Special equalisation/bias switch adjusts record and playback characteristics for standard or chromium dioxide tapes. Automatic motor shut-off at end of tape. AC mains. Price: £185 (inc. PT).

### ■ HITACHI SALES (UK) LTD

Park House, Coronation Road, Park Royal,  
London, NW107QS. Tel: 01-965 9861.  
Telex: 932268.

#### TRQ262

$\frac{1}{4}$ -track stereo tape unit with pushbutton controls. Compact cassettes. Speed:  $1\frac{7}{8}$ i/s. Two VU meters. Three-digit tape position indicator. Auto stop. Output for stereo phones and line. Walnut finished cabinet. AC mains. Size:  $9\frac{1}{2} \times 13\frac{1}{4} \times 3\frac{3}{8}$ in. Price: £67.50 (including PT).

#### TRQ757D

$\frac{1}{4}$ -track stereo tape unit. 7in spools. Quick loading tape transport. Simple lever operation. Two VU meters. Four-digit tape position indicator. Pause control. Auto shut off at end of tape. Outlets for stereo headphones and line. Vertical or horizontal operation. Size:  $16 \times 7\frac{1}{2} \times 13\frac{1}{4}$ in. Price: £79-95 (inc. PT).

★ Indicates entry is illustrated

### TRQ730D

¼-track three-head stereo tape unit. Separate record and playback heads. Monitoring. Facility to compare recorded sound with original. Three tape speeds. Easy tape loading system. Two VU meters. Line output. Size:  $16\frac{1}{8} \times 7\frac{1}{2} \times 13\frac{1}{4}$ in. Price: £89.95 (inc. PT).

### TRQ770D

Three-speed tape unit with auto-repeat and auto-reverse tape transport system. Automatic level control. Four-digit tape indicator. Two VU meters. Outlets for stereo headphones and line. Max spool 7in. Size:  $16\frac{1}{8} \times 17\frac{7}{8} \times 8\frac{7}{8}$ in. Price: £136 (inc. PT).

New range of tape units being introduced shortly. Details of prices and specifications not available at time of going to press.

### ■ KELLAR ELECTRONICS LTD

Lopen Works, Lopen Road, Edmonton, London, N18.

New range of tape recording and playback equipment incorporating Dolby B noise reduction system and Garrard cassette deck. Full details not available as this edition of the Year Book closed for press.

See Tape Amplifiers Section for details of Kellar KDB-1 noise reduction unit for use between tape unit and main amplifier.

### ■ LUXOR (Luxor Industri Aktiebolag)

Motala, Sweden. UK distributors: Lunitone, 84 Bolsover Street, London, W1. Tel: 01-636 2901.

#### MP813 ★

Stereo tape unit with amplifiers. Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$ ,  $7\frac{1}{2}$ i/s. Four track. Max spool 7in. Output: 10W RMS per channel. Built-in monitor speakers. Inputs: mic, record player, radio. Outputs: speakers, headphones, amplifier. Size:  $7\frac{1}{4} \times 20\frac{1}{2} \times 15$ in. Price: £175 (including PT).

#### MP823

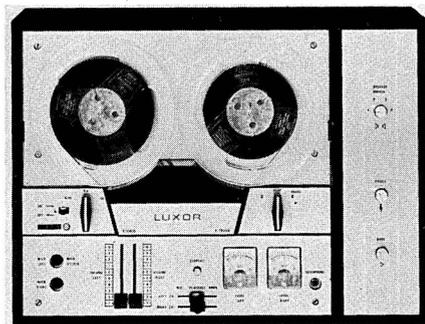
Identical specification to MP813 but without built-in amplifier. Price: £135 (including PT).

### ■ NATIONAL PANASONIC

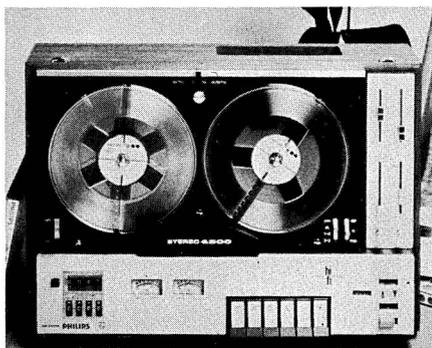
Distributed by: United Africa Mechanical and Electrical Ltd, PO Box No. 1, United Africa House, Blackfriars Road, London, SE1. Tel: 01-928 2070.

#### Panasonic RS-768U/S

¼-track 3-head 3-speed stereo tape unit. Transistorised with built-in pre-amps. Two VU meters, 4-pole hysteresis synchronous motor.



Luxor MP813



Philips N4500

Integrated circuits employed in pre-amp stages. National noise filter eliminates disturbance from non-recorded portions on tape. Auto stop, 40151T counter, sound on sound, sound with sound recording. Price: £108.85 (plus £22.75 PT).

#### Panasonic RS-735U/S

¼-track three-speed stereo tape unit. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool 7in. W and F: 0.09% at  $7\frac{1}{2}$ i/s. FR: 20Hz-28kHz. Replay char: DIN. Meter level indicator. Inputs: mic (2) 0.56mV 20K, aux (2) 0.1mV 100K, DIN input. Outlets: line (2) 0.1mV 3K. Fully transistorised circuit. Own deck. One four-pole hysteresis synchronous motor. Superimpose. Pause control. Monitoring. Input mixing. Parallel track replay. ICs incorporated. Hot pressed ferrite heads. Size:  $20 \times 14 \times 8$ in. Weight: 25lb. Mains operation (AC). Price: £116.27 (plus £28.73 PT).

### ■ NIVICO

Denham and Morley Ltd, Denmore House, 453 Caledonian Road, London, N7. Tel: 01-607 6568. Telex: 24562.

**CHR-250UB**

Eight-track stereo cartridge tape unit. Speed:  $3\frac{3}{4}$ i/s. 400ft cartridge. W and F: <0.2% RMS. Record/play time: up to 80 minutes. Two VU meters. Headphone socket for monitoring. Manual level control. FR: 30Hz-17kHz. S/N: better than 48dB. Inputs: mic(2) - 60dB at 10K, aux(2) 20dB at 100K. Output: line (2) 0-1V adjustable at 6-6K, headphones 1mW at 8 ohms. Power switched on by cartridge insertion. Choice of continuous play, repeat or automatic cartridge eject. Separate level controls for record and playback. Fast forward control. Mains: 100-240V 50/60Hz. Size:  $15\frac{1}{8} \times 4\frac{1}{4} \times 10\frac{1}{8}$ in. Weight: 13 $\frac{1}{2}$ lb. Supplied with spare tape cartridge and two input leads. Price: £99.77 (inc. PT).

**CCR-660U**

$\frac{1}{4}$ -track stereo cassette tape unit. Speed:  $1\frac{7}{8}$ i/s. Compact cassette. FR: 30Hz-15kHz. S/N: better than 45dB. Crosstalk: 30dB at 1kHz. Rewind time:  $1\frac{1}{2}$  minutes for C60 cassette. 14-transistor 8 diode circuit. Inputs: mic 0.78mV 10K, aux 80mV 330K. Output: line 0.78V 10K, headphones 0.25mW 8 ohms. W and F: <0.25%. Twin VU meters. Pause control. Tape position indicator (three-digit). Slider controls plus push-buttons. Finish: oiled walnut. Mains: 100, 115, 200, 225V 50/60Hz. Size:  $11\frac{1}{4} \times 3\frac{1}{2} \times 9$ in. Weight: 7lb. Price: £71.70 (including PT).

**TD-694U**

Three-speed stereo tape unit.  $\frac{1}{4}$ -track. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool 7in. W and F:  $7\frac{1}{2}$ i/s 0-15%,  $3\frac{3}{4}$ i/s 0-25%. FR:  $7\frac{1}{2}$ i/s 30Hz-20kHz,  $3\frac{3}{4}$ i/s 30Hz-13kHz. Inputs: mic 0.5mV 10K, aux 80mV 470K. Output: 0-1V adjustable at 3-3K. 16 transistor and 4 diode circuit. Bias frequency: 57kHz. Rewind time:  $2\frac{1}{2}$  minutes for 1,200ft tape. S/N: >50dB. Mains: 100-240V 50/60Hz. Size:  $15\frac{1}{4} \times 12\frac{5}{8} \times 8\frac{3}{8}$ in. Weight: 20lb. Price: £94.80 (inc. PT).

**Four-channel stereo tape unit**

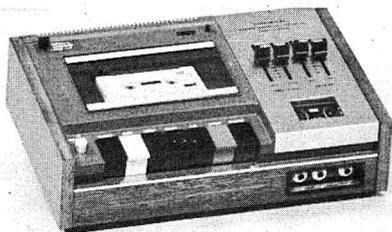
$\frac{1}{4}$ -track two-speed unit for providing up to four-channel stereo. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ i/s. Bias frequency: 60kHz. Rewind time:  $2\frac{1}{2}$  minutes for 1,200ft. W and F:  $7\frac{1}{2}$ i/s <0.15%,  $3\frac{3}{4}$ i/s <0.25%. FR:  $7\frac{1}{2}$ i/s 30Hz-20kHz,  $3\frac{3}{4}$ i/s 30Hz-13kHz. S/N: better than 52dB. THD: <0.8% (recording/playback). Equalisation: NAB. Inputs: mic (4) 0.5mV 10K. Output: 0.775V adjustable. Four-level meters for channels 1-4. Size:  $15 \times 7\frac{7}{8} \times 12\frac{3}{8}$ in. AC mains. Weight: 22lb. Price: £195.88 (inc. PT).

**PHILIPS ELECTRICAL LTD**

Century House, Shaftesbury Avenue, London, WC2. Tel: 01-437 7777.

**N4500 ★**

Mains operated  $\frac{1}{4}$ -track stereo tape unit. Speeds:



Pioneer T3300



Pioneer T6600

$7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. Max spool: 7in. W and F: <0.15%. H and N: > 50dB. FR:  $7\frac{1}{2}$ i/s 40Hz-18kHz,  $3\frac{3}{4}$ i/s 40Hz-15kHz,  $1\frac{7}{8}$ i/s 60Hz-8kHz. Replay char: CCIR. Rewind time: <3 min for 1,800ft. Two meter level indicators. Inputs: mic 0.2mV 2K, radio 2mV 20K, PU 100-150mV 1 megohm. Outlets: line 0.5-1V 20K, monitor 0.5-1V 50K, headphones 0.3V-600 ohms. Transistors. Own deck. One motor. Pause. Straight-through amplifier. Monitoring. Input mixing. Parallel track replay. Echo. Track to track transfer. Sliding fader-type controls. Size:  $19\frac{1}{8} \times 13\frac{5}{8} \times 7\frac{3}{8}$ in. Weight: 22lb. Mains: 110/250V 50/60Hz. Price: £102 (plus £24 PT).

**PIONEER**

Distributors: Shiro (UK) Ltd., 42 Russell Square, London, WC1B5DF. Tel: 01-580 6996.

**T3300 ★**

Cassette tape unit with preamplifiers. Stereo

★ Indicates entry is illustrated

$\frac{1}{4}$ -track. Speed:  $1\frac{7}{8}$ i/s. Compact cassette. W and F:  $<0.2\%$ . H and N: better than 45dB. FR: 40Hz-12kHz. Replay char: DIN. Rewind time: 70 secs. Meter level indicator. Inputs: mic (2) 0-35mV 50K, line 35mV 100K. Outlets: line 0-775V 50K, headphones 0-15mW 8ohms. One motor. Own deck. Pause control. Automatic eject mechanism at end of tape. Left and right slider controls for record and playback. Size:  $13 \times 4\frac{1}{4} \times 8\frac{3}{8}$ in. Weight: 10lb. Mains operation. Price: £82-12 (plus £17-38 PT).

**T6600 ★**

Stereo tape unit with preamplifiers.  $\frac{1}{4}$ -track. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ i/s. Max spool 7in. W and F:  $7\frac{1}{2}$ i/s  $<0.12\%$ ,  $3\frac{3}{4}$ i/s  $<0.2\%$ . H and N: better than 55dB. FR:  $7\frac{1}{2}$ i/s 30Hz-20kHz,  $3\frac{3}{4}$ i/s 30Hz-13kHz. Replay char: DIN. Rewind time: 110 secs for 1,200ft. Meter level indicator. Inputs: mic (2) 0-3mV 50K, line (2) 30mV 330K. Outlets: line (2) 0-775V 50K, headphones 0-2mW 8 ohms. One motor, centre capstan drive. Own deck. Size:  $17\frac{1}{4} \times 17\frac{1}{4} \times 7\frac{3}{8}$ in. Weight: 28 $\frac{1}{2}$ lb. Pause control. Straight-through amplifier. Automatic reverse on record and playback. AC mains operation. Price: £155 (plus £32-83 PT).

**T8800 ★**

Stereo tape unit with preamplifiers.  $\frac{1}{4}$ -track. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ i/s. Max spool 7in. W and F:  $7\frac{1}{2}$ i/s  $<0.08\%$ ,  $3\frac{3}{4}$ i/s  $<0.15\%$ . H and N: better than 55dB. FR:  $7\frac{1}{2}$ i/s 30Hz-20kHz,  $3\frac{3}{4}$ i/s 30Hz-15kHz. Replay char: DIN. Rewind time: 110 secs for 1,200ft. Two level meters. Inputs: mic (2) 0-5mV 50K, line (2) 55mV 100K. Outlets: line 0-775V 50K, line 0-1V, headphones 0-4mW 8 ohms. Two motors (eight-pole/four pole). Own deck. Size:  $21\frac{7}{8} \times 9\frac{1}{2} \times 17$ in. Weight: 50lb. Superimpose. Pause control. Monitoring. Input mixing. Parallel track replay. Automatic reverse on record and replay. Three plus three heads. Recording bias selector switch. Adjustable reel height. Optional remote control. AC mains operation. Price: £294 (plus £62-26 PT).

■ **PLANET PROJECTS LTD**

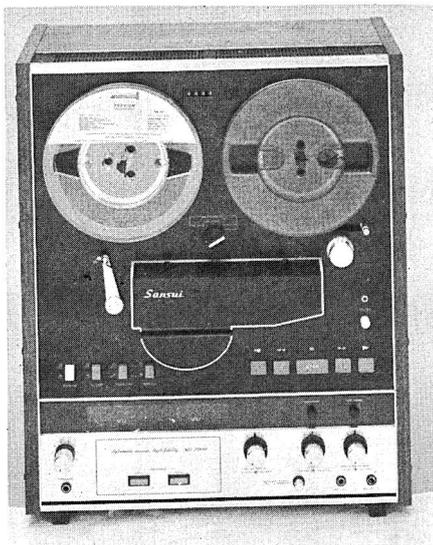
Goodman Works, Belvue Road, Northolt, Middlesex. Tel: 01-845 1775.

**C.D.2.P.A.**

This comprises model C.D.2 tape deck (see Tape Deck section) with built-in pre-amplifier and power supply. Power supply provides correct voltages for operating both relays and also a stabilised supply for the pre-amplifier. Pre-amplifier is three-stage direct coupled block using high frequency silicon planar transistors. Equalisation and stability is achieved with multiple feedback loops operating down to



Pioneer T8800



Sansui SD7000

DC. Average output: 250mV. Output impedance: 200 ohms to be fed into a load not less than 2.5K. FR: 30Hz-12kHz + 3dB. HD not greater than 3dB. S/N 50dB. Price on application.

■ **SANSUI**

Vernitron Ltd., Thornhill, Southampton, SO9 5QF. Tel: Southampton 44811.

**Sansui SD7000 ★**

Stereo tape unit.  $\frac{1}{4}$ -track. Two speeds. FR:  $7\frac{1}{2}$ i/s 15Hz-25kHz. Forward and reverse playback. Max spool 7in. W and F:  $<0.06\%$ . Fast

rewind: 100 seconds for 1,800ft. Pause. Sleep control. Price: £328.76 (plus £83.81 PT).

### ■ SANYO

Sanyo Marubeni (UK) Ltd, Sanyo House, Bushey Mill Lane, Watford, Herts.  
Tel: Watford 25354/6.

#### MR801 ★

$\frac{1}{4}$ -track 3-speed tape unit. 7in reels. W and F:  $7\frac{1}{2}$ i/s 0.15%,  $3\frac{3}{4}$ i/s 0.2%,  $1\frac{7}{8}$ i/s 0.3%. H and N:  $7\frac{1}{2}$ i/s -45dB unweighted 50dB weighted. FR:  $7\frac{1}{2}$ i/s 20Hz-20kHz  $\pm$ 3dB. Other speeds:  $3\frac{3}{4}$ i/s 30Hz-13kHz;  $1\frac{7}{8}$ i/s 30Hz-8kHz. Replay char: NAB ( $7\frac{1}{2}$ i/s). 2 VU meters. Rewind 2 min 1,200ft. Inputs: mic 0.3mV 50K, line 100mV 300K, tuner 4mV 10K. Outputs: line 800mV, 2K; amp 800mV, 2K; headphones 8 ohms or 10K. Digital position indicator. Monitor. Sound-with-sound. Auto stop. Pause. Psn 100V, 117V, 125V, 220V, 240V, 50Hz, 35W. Size:  $15\frac{3}{8} \times 12\frac{7}{8} \times 6\frac{3}{4}$ in. Weight: 18lb. Price: £69.95 (including PT).



Sanyo MR801

### ■ SCOPETRONICS

Crown Works, Church Road, Kingston-upon-Thames, Surrey. Tel: 01-546 1275 and 4135.

#### 1150

Stereo tape unit. Speeds:  $7\frac{1}{2}$ , 15i/s. Max spool capacity: 11 $\frac{1}{2}$ in. W and F: 0.08% (both speeds). H and N: -57dB. FR:  $7\frac{1}{2}$ i/s 40Hz-15kHz  $\pm$   $\frac{1}{2}$ dB; 15i/s 40Hz-15kHz  $\pm$   $\frac{1}{2}$ dB. Replay char: NARTB, CCIR. Level indicator: meter. Rewind time: 2,400ft in < 1 min 45 sec. Inputs: line in, 2V 100K. Line out, 1mW 600 ohms. Valves. Motors: 3 Papst Ext. Rotor. Tape deck: own. Superimpose, pause and inching facilities. Straight-through amplifier. Variable spooling. Removeable plug-in head block. Psn: 250V 50Hz. Price: mono, £341.50; stereo, £493.50. Console versions: add £75.



Sharp RD712

### ■ SHARP

Sharp Electronics (UK) Ltd, 48 Derby Street, Manchester, M88HN. Tel: 061-832 6115.

#### RD712D ★

Mains operated stereo  $\frac{1}{4}$ -track tape unit. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s. W and F:  $7\frac{1}{2}$ i/s 0.15%,  $3\frac{3}{4}$ i/s 0.2%,  $1\frac{7}{8}$ i/s 0.2%. FR:  $7\frac{1}{2}$ i/s 40Hz-16kHz  $\pm$  6dB,  $3\frac{3}{4}$ i/s 50Hz-9kHz,  $1\frac{7}{8}$ i/s 50Hz-3.5kHz. Max spool: 7in. Three digit tape indicator. Rewind time: less than 2 min for 1,200ft. Replay char: DIN. Meter level indicator. Inputs: mic 0.1mV 200 ohms, aux 5mV 15K. Output: line 3K. One motor. Parallel track replay. Mains: 110, 200, 220, 240V 50/60Hz. Size:  $11\frac{3}{4} \times 15\frac{3}{4} \times 6\frac{3}{4}$ in. Weight: 22lb. Price: £60.14 (plus £14.86 PT).

#### RD423E ★

Mains operated  $\frac{1}{4}$ -track stereo tape unit. Speed:



Sharp RD423E

★ Indicates entry is illustrated

1 $\frac{7}{8}$ i/s. W and F: 0-18% max. FR: 40Hz-13kHz. Compact cassette. Three digit tape indicator. Dual VU meters. Weight: 5 $\frac{3}{4}$ lb. Price: £46-11 (plus £11-39 PT).

### ■ SONY (UK) LTD

Pyrene House, Sunbury Cross, Sunbury-on-Thames. Tel: Sunbury-on-Thames 87644/7.

#### TC252D ★

Stereo tape unit with preamps only.  $\frac{1}{4}$ -track. Speeds: 3 $\frac{3}{4}$  and 7 $\frac{1}{2}$ i/s. Max spool capacity: 7in. W and F: 0-12% 7 $\frac{1}{2}$ i/s. H and N: 52dB 7 $\frac{1}{2}$ i/s. FR: 30Hz-18kHz 7 $\frac{1}{2}$ i/s and 40Hz-13kHz 3 $\frac{3}{4}$ i/s. Replay char: NARTB. Level indicator: 2 meters. Inputs: 2 microphone 195mV 600 ohms, 2 aux 62mV 560K, DIN connector 5-4mV 10K. Outlets: 2 line 775mV 100K, headphone 30mV 8 ohms, DIN connector 775mV 100K. Features: pause, inching, monitoring, parallel track replay, horizontal or vertical operation. Mains: 100, 110, 117, 125, 220, 240V 50/60Hz. Weight: 17lb 11oz. Dimensions: 15 $\frac{1}{4}$  × 13 $\frac{7}{16}$  × 7 $\frac{1}{2}$ in. Price: £58-35 (plus £14-40 PT).

#### TC366 ★

Stereo tape unit with preamps.  $\frac{1}{4}$ -track. Speeds: 7 $\frac{1}{2}$ , 3 $\frac{3}{4}$ , 1 $\frac{7}{8}$ i/s. Max spool 7in. W and F: 7 $\frac{1}{2}$ i/s < 0-09%, 3 $\frac{3}{4}$ i/s < 0-17%. FR: 7 $\frac{1}{2}$ i/s 20Hz-25kHz, 3 $\frac{3}{4}$ i/s 30Hz-17kHz, 1 $\frac{7}{8}$ i/s 30Hz-9kHz. Rewind time: 100 secs for 1,200ft. Two VU meters. Inputs: mic 0-19mV (-72dB) 600 ohms, aux 0-06V (-22dB) 100K. Outputs: line 0-775V 100K, headphones 8 ohms. Stereo recording and playback. S/N: better than 52dB (normal), 55dB (SLH). Three heads. Input mixing. Auto stop. Size: 16 $\frac{1}{2}$  × 8 $\frac{3}{8}$  × 14 $\frac{7}{8}$ in. Finish: walnut grained wood. Price: £110 (including PT).

#### TC127 ★

Stereo cassette tape unit.  $\frac{1}{4}$ -track. Compact cassette. Speed: 1 $\frac{7}{8}$ i/s. W and F: 0-2%. FR: 30Hz-12kHz. S/N: 48dB. Two VU meters. Inputs: mic 0-2mV (-72dB) low impedance, aux 0-035mV (-27dB) 560K, record/playback connector -40dB 3-9K. Outputs: line 0-775V (0dB) 100K, headphones 8 ohms, record/playback connector 0dB 8-2K. Slider level controls. Size: 15 $\frac{3}{8}$  × 3 $\frac{3}{8}$  × 8 $\frac{5}{8}$ in. Weight: 10lb 9oz. Mains: 100, 110, 117, 125, 220 or 240V. Price: £69-75 (including PT).

### ■ STUDER

Studer-Franz AG, Switzerland.  
Distributors: F. W. O. Bauch Ltd.,  
49 Theobald Street, Boreham Wood, Herts.  
Tel: 01-953 0091.

#### Studer A80 ★

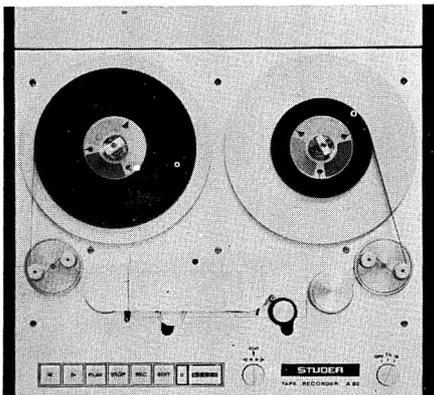
Professional tape unit with preamplifiers. Mono or stereo on  $\frac{1}{4}$ in tape, four-track on  $\frac{1}{2}$ in tape,



Sony TC-252D

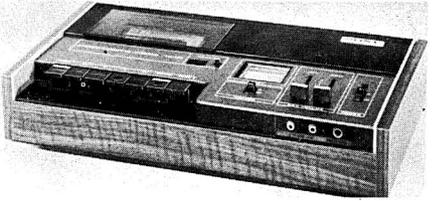


Sony TC366



Studer A80 (Top)

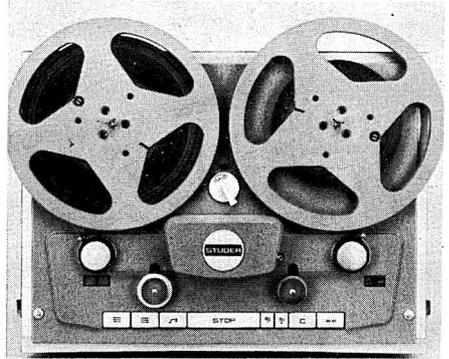
four-track or eight-track on 1in tape, 16-track on 2in tape. Speeds:  $7\frac{1}{2}$  and 15i/s. Max spool: 12in. W and F: 15i/s  $\pm 0.05\%$ ,  $7\frac{1}{2}$ i/s  $\pm 0.08\%$ . H and N: 15 i/s 62dB;  $7\frac{1}{2}$ i/s 60dB. FR: 15i/s 30Hz-18kHz  $\pm 1$ dB;  $7\frac{1}{2}$ i/s 60 Hz-12kHz  $\pm 0.75$  dB. Replay char: switchable NAB/CCIR. Rewind time:  $2\frac{1}{2}$  minutes for 1,000 metres. Separate VU meter for each channel. Inputs: 0.3V to 10V ( $-8$ dBm to  $+22$ dBm) adjustable. Balanced input with impedance higher than 8K between 30Hz-18kHz. Outputs:  $-8$ dBm to  $+24$ dBm adjustable. Output balanced with impedance less than 30 ohms between 30Hz-18kHz. Servo-controlled capstan motor, two high-torque asynchronous spooling motors. Tape deck control by eight printed circuit cards equipped with logic circuits, giving constant tape tension throughout all operating modes. Five-digit counter indicating hours, minutes and seconds (accuracy 0.3%). Mains: 240V AC. Prices and further details to professional users on request.



Sony TC 121

**Studer B62 ★**

Professional tape unit with preamplifiers. Mono, stereo or twin-track on  $\frac{1}{4}$ in tape. Speeds:  $7\frac{1}{2}$  and 15i/s. Max spool: 10 $\frac{1}{2}$ in. W and F: 15i/s 0.03%,  $7\frac{1}{2}$ i/s 0.06%. H and N: 15i/s 59dB,  $7\frac{1}{2}$ i/s 54dB. FR: 15i/s and  $7\frac{1}{2}$ i/s 30Hz-18kHz  $\pm 0.75$ dB. Replay char: CCIR or NAB by quick-change equaliser printed circuit cards. Rewind time: 100 seconds for 700 metres. Servo-controlled capstan motor, two high-torque asynchronous spooling motors. Size: 19 x 14 x 8 $\frac{3}{8}$ in. Accurate tape timer indicating minutes and seconds. Mains: 240V AC. Prices and further details to professional users on request.



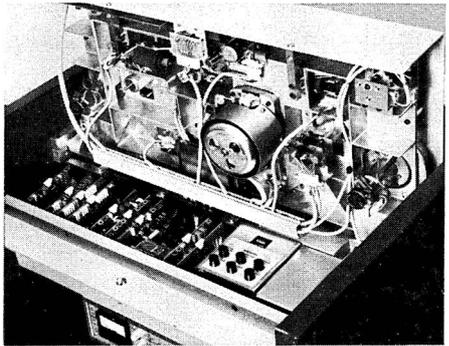
Studer B62

**TANDBERG**

Farnell-Tandberg Ltd, 81 Kirkstall Road, Leeds, LS3 1HR. Tel: Leeds 35111.

**3041X ★**

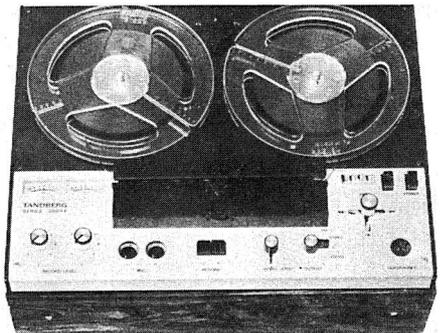
Tape unit with preamps. Stereo.  $\frac{1}{4}$ -track. Speeds:  $1\frac{1}{8}$ ,  $3\frac{3}{4}$  and  $7\frac{1}{2}$ i/s. Max spool capacity: 7in. W and F: 0.1%  $7\frac{1}{2}$ i/s, 0.2%  $3\frac{3}{4}$ i/s, 0.4%  $1\frac{1}{8}$ i/s. H and N: 57-51dB. FR ( $\pm 2$ dB): 40Hz-20kHz  $7\frac{1}{2}$ i/s, 50 Hz-16kHz  $3\frac{3}{4}$ i/s, 50 Hz-9kHz  $1\frac{1}{8}$ i/s. Meter indicators. Rewind time: 2min 1,200ft. Inputs: mic 100mV 200 ohms, line 100mV 1M, radio 5mV 57K. Outlets: emitter follower 0.75V 100 ohms, headphones 0.75V 100 ohms. Features: pause, inching, straight-through amp, input mixing, parallel track replay; off tape monitoring. Weight: 20lb. Dimensions: 15 $\frac{1}{2}$  x 12 $\frac{3}{8}$  x 6 $\frac{1}{2}$ in. Price: £109.90 (including PT); (rosewood) £112.90 (including PT).



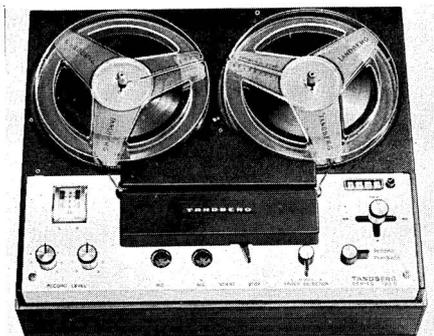
Studer A80 (Underside)

**6041X**

Stereo tape unit with deck details as above.



Tandberg 3041X



Tandberg 1841

Inputs: mic 70mV 200 ohms, radio 5mV 100K, PU 1mV 33K. Outlets: left, right and centre channels, and headphones, each 1.5V 200 ohms. Features as 3000X plus built-in mixing preamp and A-B test. Weight: 23.3lb. Dimensions:  $15\frac{1}{2} \times 11\frac{7}{8} \times 6\frac{7}{8}$ in. Price: £195 (including PT); (rosewood) £198 (including PT).

#### 6021X

Similar specification to 6041X but  $\frac{1}{2}$ -track. Price: £195 (including PT).

#### 3021X

Similar specification to 3041X but  $\frac{1}{2}$ -track. Price: £109.90 (including PT).

#### 1841X ★

Stereo  $\frac{1}{4}$ -track tape unit with preamplifiers. Speed:  $3\frac{3}{4}$ i/s. Max spool  $5\frac{1}{2}$ in. Meter level indicator. 23 transistor circuit. Four-digit tape indicator. Straight-through amplifier. Monitoring. AC mains. Output: 0.75V. Finish: teak or rosewood. Size:  $13\frac{1}{4} \times 6\frac{1}{4} \times 11$ in. Weight: 14lb. Price: £69.75 (including PT); microphone £7.50 extra.

### ■ TAPE RECORDER DEVELOPMENTS

Hall Lane, Walsall Wood, Staffs.

Tel: Brownhills 5351.

#### 600 Series

4 speed tape units. Independent gain controls for microphones, line inputs, and line outputs. Speeds: (top)  $7\frac{1}{2}$ , 15 or 30i/s. Upper and lower track function controls. Meter reads 1 or 2 channel or peak of either. Adjustable bias read on meter. Four speed equalisation to DIN 45-513 or NAB. Locking DIN sockets. Input mixing. See TRD1 deck information in Tape Deck section. Inputs: mic 30 to 600 ohms, 70dBm for 600 ohms; line 600 ohms/10K bridging -20dBm +10dBm max into 600 ohms. Output: +10dB max into 600 ohms. FR: 15i/s

40Hz-20kHz;  $7\frac{1}{2}$ i/s 40Hz-18kHz;  $3\frac{3}{4}$ i/s 40Hz-14kHz;  $1\frac{7}{8}$ i/s 40Hz-8kHz (all  $\pm 2$ dB). Prices: (replay only machines) £192 to £205; (record/playback machines) £271 to £285. Extras: (remote control) £25; (fourth head and switch) £18; ( $\frac{1}{2}$ in tape width) £25; ( $\frac{1}{2}$ in heads) £220. Supplied to professional and scientific users only free of tax.

### ■ TEAC

Lasky Radio Ltd, 3-15 Cavell Street,

Tower Hamlets, London, E1 2BN.

Tel: 01-790 4821.

#### A-2300

$\frac{1}{4}$ -track two-speed stereo tape unit. Speeds:  $7\frac{1}{2}$ i/s,  $3\frac{3}{4}$ i/s. Max spool 7in. W and F: 0.12% at  $7\frac{1}{2}$ i/s. FR: 30Hz-20kHz at  $7\frac{1}{2}$ i/s. Automatic reverse. Pause control. S/N: 50dB. Bias control for different types of tape. Technobuilt hyperbolic heads. Three motors. Solenoid operated pushbutton controls. Four-digit tape position indicator with reset button. Twin record level meters. Vertical operation. Teak end panels. Price and full specification on request.

### ■ TELEFUNKEN

Distributor: AEG (Great Britain) Ltd,

AEG House, Chichester Rents, Chancery Lane, London, WC2. Tel: 01-242 9944.

#### 250 Hi-Fi ★

Two speed  $\frac{1}{2}$ -track stereo tape unit. 7in reels. W and F:  $3\frac{3}{4}$ i/s  $\pm 2.5\%$ ,  $7\frac{1}{2}$ i/s  $\pm 2\%$ . H and N:  $3\frac{3}{4}$ i/s -54dB,  $7\frac{1}{2}$ i/s -54dB. FR:  $3\frac{3}{4}$ i/s 40Hz-15kHz,  $7\frac{1}{2}$ i/s 40Hz-18kHz. Replay char: DIN Standard 45-500. Level meters. Inputs: tuner 0.15mV 2K; mic 0.15mV 2K; PU/tape 150mV 2.2M. Outputs: Amplifiers 1.5V 10K; earphones 1V into 400 ohms load. Echo at  $3\frac{3}{4}$ i/s. Reverberation at  $7\frac{1}{2}$ i/s. Monitor combined with instruments. Parallel recording and playback. Track-to-track transcription. Function selector. Record light. Volume control for headphones. Slide control for record level. Preset level controls. Sound-on-sound. Pause. Psn 110/240V AC. Size:  $18\frac{1}{4} \times 12\frac{1}{4} \times 4\frac{1}{4}$ . Weight: 26lb. Price: £114.80 (plus £28 PT).

#### M205 ★

Three-speed  $\frac{1}{4}$ -track stereo tape unit. Max spool: 7in. Speeds:  $1\frac{7}{8}$ ,  $3\frac{3}{4}$ ,  $7\frac{1}{2}$ i/s. W and F:  $1\frac{7}{8}$ i/s 0.4%,  $3\frac{3}{4}$ i/s 0.25%,  $7\frac{1}{2}$ i/s 0.15%. H and N:  $3\frac{3}{4}$ i/s -45dB,  $7\frac{1}{2}$ i/s -50dB. FR:  $1\frac{7}{8}$ i/s 40Hz-8kHz,  $3\frac{3}{4}$ i/s 40Hz-15kHz,  $7\frac{1}{2}$ i/s 40Hz-18kHz. Inputs: mic, radio, pickup. Outlets: phones, line. Vertical or horizontal operation. Pause control. Multi-function switch. Four-digit tape position indicator. Separate record level controls for left and right channels. Clear plastic lid.



Telefunken 250 Hi-Fi



Telefunken M-205

Mains: 110-240V AC. Price: £70.07 (plus £17.08 PT).

### ■ TELETON

Teleton Electro (UK) Ltd, Teleton House, Robjohns Road, Chelmsford, Essex.  
Tel: Chelmsford 62442.

#### STP801

Eight-track tape player unit. Stereo. Speed:  $3\frac{3}{4}$ i/s. Eight-track cartridge. W and F: 0.35%. FR: 40Hz-10kHz. Continuous play, no rewind. Output: 1.5W RMS. DC motor with governor. Two matching speaker units  $11 \times 8 \times 5\frac{1}{2}$ in. Main unit  $14\frac{1}{2} \times 10\frac{1}{2} \times 4$ in. Mains: 230V 50Hz. Price: £54.75 (including PT).

#### 999

Three-speed stereo tape unit. Max spool 7in. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s.  $\frac{1}{4}$ -track mono,  $\frac{1}{2}$ -track stereo. Horizontal or vertical operation. W and F:  $7\frac{1}{2}$ i/s  $\pm 0.2\%$ ,  $3\frac{3}{4}$ i/s  $\pm 0.2\%$ ,  $1\frac{7}{8}$ i/s  $\pm 0.3\%$ . FR:  $7\frac{1}{2}$ i/s 25Hz-20kHz  $\pm 4$ dB,  $3\frac{3}{4}$ i/s 40Hz-

10kHz  $\pm 4$ dB,  $1\frac{7}{8}$ i/s 40Hz-5kHz  $\pm 4$ dB. S/N:  $7\frac{1}{2}$ i/s 48dB,  $3\frac{3}{4}$ i/s 46dB,  $1\frac{7}{8}$ i/s 44dB. Separation: better than 40dB. HD: better than 0.3% RMS. Inputs: mic 4mV 10K, PU 15mV 10K, DIN socket 15mV 10K, PU 100mV 100K. Outputs: 500mV 10K, 800mV 2K, headphone socket 35mV 8 ohms, 20 transistors, 6 diodes. Mains: 110/240V AC 50Hz. Size:  $15\frac{1}{2} \times 14 \times 5\frac{3}{4}$ in. Weight: 22lb. Price: on application.

#### FXB510D

Three-speed  $\frac{1}{4}$ -track stereo tape unit. Max spool 7in. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ i/s.  $\frac{1}{4}$ -track mono,  $\frac{1}{2}$ -track stereo. Horizontal or vertical operation. W and F:  $7\frac{1}{2}$ i/s  $\pm 0.2\%$ ,  $3\frac{3}{4}$ i/s  $\pm 0.3\%$ ,  $1\frac{7}{8}$ i/s  $\pm 0.5\%$ . Four-pole synchronous motor. FR:  $7\frac{1}{2}$ i/s 50Hz-12kHz,  $3\frac{3}{4}$ i/s 50Hz-6kHz. S/N: better than 35dB. Separation: better than 40dB. HD: better than 0.5%. Inputs: mic 5mV 10K, line 100mV 220K, line 0.78V 10K. 11 transistors, 9 diodes. Mains: 110-240V 50Hz. Size:  $14\frac{1}{2} \times 14 \times 6\frac{1}{2}$ in. Price: on application.

### ■ TRIO

Distributors: B. H. Morris & Co (Radio) Ltd, 84-88 Nelson Street, Tower Hamlets, London, E12 2DY. Tel: 01-790 4824.

#### KX7010

Stereo cassette tape unit.  $\frac{1}{4}$ -track. Speed:  $1\frac{7}{8}$ i/s. Compact cassettes. W and F:  $< 0.2\%$ . H and N: better than 45 dB. FR: 40Hz-10kHz. Rewind time:  $< 70$  seconds with C60 cassette. Two VU meters. Inputs: microphone (left and right) 0.25mV (69dB) at 50K, line (left and right) 100mV (18dB) at 470K. Outlets: line (left and right) 0.775V (0dB) at greater than 50K, headphones at 8 ohms or over. One motor. Own deck. Pause control. HF filter, Three-digit tape position indicator. Automatic eject cassette system. Record/play indicator light. Size:  $10\frac{1}{2} \times 9 \times 4$ in. Weight: 7lb. Mains: 100, 110, 117, 125, 220 and 240V 50/60Hz. Price: to be announced.

### ■ UHER

Distributors: Bosch Ltd, Rhodes Way, Radlett Road, Watford, Herts, WD24LB.  
Tel: Watford 44233.

#### Uher Royal de luxe (C)

Transistorised semi-professional mains tape unit. Mono/stereo.  $\frac{1}{4}$ -track or  $\frac{1}{2}$ -track. Speeds:  $7\frac{1}{2}$ ,  $3\frac{3}{4}$ ,  $1\frac{7}{8}$ ,  $\frac{1}{2}$ i/s. Max spool 7in. W and F:  $7\frac{1}{2}$ i/s 0.05%,  $3\frac{3}{4}$ i/s 0.1%,  $1\frac{7}{8}$ i/s 0.25%,  $\frac{1}{2}$ i/s 0.35%. H and N:  $7\frac{1}{2}$ i/s -54dB,  $3\frac{3}{4}$ i/s -54dB,  $1\frac{7}{8}$ i/s -54dB. FR:  $7\frac{1}{2}$ i/s 20Hz-20kHz,  $3\frac{3}{4}$ i/s 20Hz-15kHz,  $1\frac{7}{8}$ i/s 20Hz-9kHz,  $\frac{1}{2}$ i/s 20Hz-5kHz. Replay char: NARTB. Level indicators: two meters. Inputs: mic 0.2mV-100mV 200 ohms,

★ Indicates entry is illustrated



Wharfedale DC9

radio 2mV-1V 47K, PU(1) 50mV 1 megohm. PU(2) 200mV 50K. Outlets: line 775mV 15K. One Papst motor. Pause. Inching. Horizontal or vertical operation. Input mixing. Parallel track replay. Interchangeable head assemblies available as optional extras. Dia-pilot. Multiplay. Echo. Price: £233.90 (including PT).

#### ■ WHARFEDALE

Rank Wharfedale Ltd, Bradford Road, Idle, Bradford, Yorks. Tel: Bradford 612552.

#### DC9 ★

Cassette tape unit incorporating the Dolby B noise reduction system. Stereo. Speed:  $1\frac{7}{8}$ i/s. Compact cassette. W and F: <0.18%. FR: 50Hz-12kHz  $\pm 2$ dB. Rewind time: <120 seconds for C90 cassette. Level indicators: twin VU meters. Inputs: mic 0.2mV  $\pm 2$ dB for zero VU, aux 100mV  $\pm 2$ dB for zero VU. Solid-state speed-controlled DC motor. Pause control. Mains: 240V 50Hz. Price: £92 (plus £23 PT).

HIGH FIDELITY SOUND —  
that something extra provided by

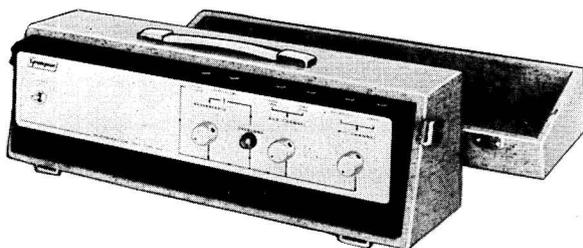
**Grampian**

**AMBIOPHONY** — the extra dimension to sound which can be easily added to  
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**Type 666 Ambiophony Unit**

This, together with its small ancillary loudspeakers changes your whole acoustic  
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For adding reverberation to sound as heard direct from your existing loudspeakers  
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**SOUND EQUIPMENT**

**GRAMPIAN REPRODUCERS LTD**

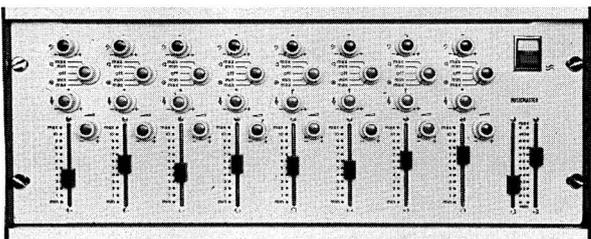
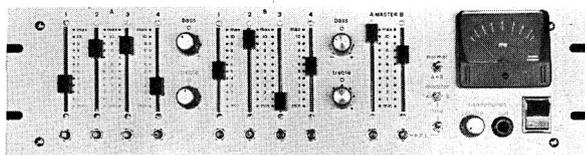
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# Professional....

MICROPHONES · AMPLIFIERS · SOUND MIXERS  
AUDIO MODULES · RE-INFORCEMENT  
LOUDSPEAKERS

## MCC

8 Channel Mono/  
Stereo – Plug in Input  
Modules – Twin 600  
ohm Balanced Outputs  
– VU or PPM.

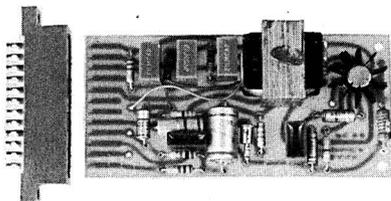
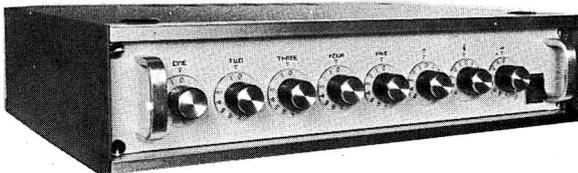


## MUSIC- MASTER

8 Channel Mono/  
Stereo – Switched In-  
put Selection – Bass,  
Treble, & Sensitivity  
Controls each Channel  
– Twin Outputs 1V into  
10K.

## AMPLIFIERS

Fully protected –  
Plug-in Inputs – Rack  
– Stack Free Standing  
– 30, 50, 100 Watts –  
1-3-5 Inputs.  
Budget versions 12  
& 20 watts.



## MODULES

Microphone, Linear, Mono P.U. Tape  
Head Stereo Tone Control – 600 ohm  
Balanced Output – Power Supplies –  
Meter Amplifiers.

**At Millbank we've got it – made**

## Millbank Electronics

Bellbrook Estate,

Uckfield, Sussex, England.

Telephone: Uckfield 4166 (0825-4166)

*(The address above is our new address as from 1st August 1971)*



# Tape Amplifiers and Mixer Units

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ ALPHA

Distributors: Highgate Acoustics Ltd,  
184-188 Great Portland Street, London, W1.  
Tel: 01-636 2901.

### DB5

Noise reducing unit for use between any tape recorder or tape unit and main hi-fi amplifier. Phono and DIN sockets for inputs and outputs. Inputs: two line inputs (>20K) with level control. Input sensitivity: 60mV for Dolby level (0 VU). Slider type level controls. Two VU meters. Outputs: 580mV for 0 VU at 1K impedance. HD: <0.5% at Dolby level at any frequency 20Hz-15kHz. Noise reduction: 3dB at 600Hz, 6dB at 1,200Hz, 9dB at 2-4kHz, 10dB at 4-20kHz. With noise reduction switched out the unit becomes a unity gain amplifier. MPX 19kHz filter, response <1dB down at 15kHz, >30dB down at 19kHz and >20dB down at 38kHz. Mains: 117, 220, 230, 250V AC. Price: £59.

## ■ BRENELL ENGINEERING CO LTD

231/5 Liverpool Road, N1.  
Tel: 01-607 8271 (5 lines).

### Mk 5 Series 3 Record/playback amplifier

Inputs: microphone 2mV, radio/gram 75mV, both high imp. Outputs: 500mV into 47K and 3W into 15 ohms for direct connection to loudspeaker. Headphone monitoring. ME level ind or meter if required. Price: £33.50 (plus £8.38 PT); metered version £37.65 (plus £9.42 PT). Note: amplifiers supplied separately are not taxable.

### Brenell Mixer Unit

Three-channel unit. High imp sources. There are 4 sockets for jack plugs for the three inputs and the output lead, each input having a volume control. Price: £3-90.

### STB2 Monitor amplifier

See Tape Units section.

### Hi-Fi Tape Unit ★

Stereo tape preamplifier and oscillator unit.

Connects between tape deck and hi-fi system. Twin transistorised recording amplifiers, bias/erase oscillator, twin transistorised playback amplifiers. Designed for use with three-headed stereo tape deck (i.e. separate erase, record and playback heads).  $\frac{1}{4}$ -track or  $\frac{1}{2}$ -track. Mono and stereo recording facilities provided. Monitoring. Immediate comparison of recorded and original signal. Individual gain controls for each amplifier. Frequency correction for four tape speeds. Inputs: mic 200 $\mu$ V 200 ohms, aux 8mV 50K, aux 8mV 50K. Cross-fade mixing between inputs. Two illuminated level meters. Output: 1.4V (2V at 2% distortion level). FR: (when used with specified heads) 7 $\frac{1}{2}$ i/s 40Hz-20kHz  $\pm$ 3dB, 3 $\frac{3}{4}$ i/s 50Hz-14kHz  $\pm$ 3dB, 1 $\frac{7}{8}$ i/s 60Hz-7kHz ( $\pm$ 3dB), 15i/s 40Hz-22kHz  $\pm$ 3dB. S/N: 56dB. Size: (tape link) 15  $\times$  7  $\times$  4 $\frac{1}{2}$ in; (power unit) 5 $\frac{1}{2}$   $\times$  5 $\frac{3}{4}$   $\times$  4 $\frac{1}{2}$ in. Weight: (tape link) 9lb; (power unit) 5lb. Price: (complete with PU) £73 (plus £18.27 PT).

## ■ DEIMOS LTD

8 Corwell Lane, Hillingdon, Middx.  
Tel: 01-573 3561.

### Deimos Tape Amplifier

Miniature stereo/mono system with plug-in all-silicon transistor modules. Separate record and playback amplifiers. Sensitivity 30mV. Output 6V RMS. Meter level indicator. Separate power supply. Size: panel 13 $\frac{1}{2}$   $\times$  2 $\frac{1}{2}$ in, depth 4 $\frac{1}{2}$ in. Prices on application. Kit may be available.

## ■ EAGLE INTERNATIONAL

Heather Park Drive, Wembley, HAI 1SU.  
Tel: 01-903 0144.

### MP12 ★

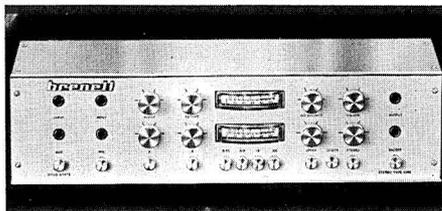
Six-channel stereo/mono mixer and preamplifier. Studio type slider controls. Mic inputs can be individually switched between high and low impedance. Inputs: four microphone 1mV 600 ohms or 2mV 50K, two pickup 3-5mV at 47K RIAA. S/N better than 50dB. Output: (switched stereo/mono) two 250mV. Low profile desk console. Price: £24.50.

## ■ A. R. FRANKLIN

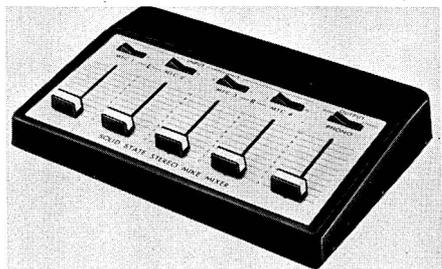
(Audio engineer), 4 Birch House, Penge,  
London, SE20. Tel: 01-659 0912.

### Control unit/mixer

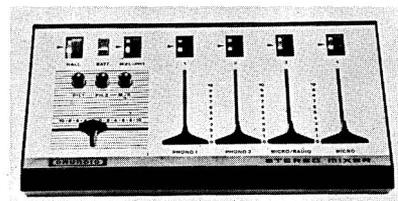
Six-channel mono, or three plus three channel stereo. All inputs 100mV 47K for 1V output into 47K. HD <0.2%. FR 10Hz-68kHz  $\pm$ 3dB. Noise -60dB. Maximum output 3V. Inputs infinitely variable. Headphone position with pre-select listening. Mains: 110-250V 50-60Hz. Size: 12 $\frac{1}{2}$   $\times$  9  $\times$  3 $\frac{1}{2}$ in. Price: £26.



Brenell Tape Link



Eagle MPI2



Grundig 422 stereo mixer

#### Stereo control unit/mixer

Four inputs at 800K selected by switching. Microphone mixing independent of selector switch. Controls: treble, bass, balance. Headphone position. HD <0.2%. FR 20Hz-30kHz  $\pm$  3dB. Maximum output 3V. Microphone input 20mV, other inputs up to 3V. Mains: 110-250V 50-60Hz. Size:  $12\frac{1}{2} \times 9 \times 3\frac{1}{4}$ in. Price: £26.

#### Plug-in preamplifiers

Stereo modular preamplifiers for use with above control unit/mixers. For low impedance microphones: £6 and £12. For magnetic pickup with RIAA correction: £6. For tape head: £6.

#### GRAMPIAN REPRODUCERS LTD

19 Hanworth Trading Estate, Feltham, Middx. Tel: 01-894 9141/3. Cables: Reamp, Feltham.

#### Grampian 18/4

Four channel pre-amplifier mixer. Transistors. Inputs: 0.2mV 25 ohms. 0.8mV 600 ohms, 10

mV high impedance, 100mV high impedance. Output: 0.775V. Output impedance: 600 ohms floating. Distortion <1.5%. Bass control: -8 dB at 100Hz on mic,  $\pm$ 8dB at 100Hz on aux. Treble control: +8dB 25dB at 10kHz. FR 100Hz-10kHz  $\pm$ 3dB (tone controls level). Noise: -60dB. Supply: PP9 (or equivalent) 9V battery. Consumption: average 18mA. Jack socket outlet at rear. Size:  $11\frac{3}{8} \times 7 \times 2\frac{3}{4}$ in. Weight: 4 $\frac{1}{2}$ lb. Price: £39.75.

#### Grampian 16/6

Six-channel pre-amplifier mixer for professional sound engineers. Six independently controlled microphone inputs. On-off key switch for each input permits gain control to be preset if desired. Master gain control normally controls all channels but there is provision for some inputs to operate independently. Sensitivity: 0.2mV input for 0.775V output. Output meter scaled for 1V with overload warning on scale, 1mW indicated by red marker at 0.775V. Specially damped movement. Output impedance: 600 ohms floating. Distortion: <0.1% for 0.775V output. FR 100Hz-15kHz +2dB with tone controls level. Bass cut: -10dB at 100Hz. Treble cut: -12dB at 10kHz. Treble lift: +6dB at 10kHz. H and N better than -65dB. Input sensitivity from 200  $\mu$ V at 25 ohms to 100mV at high impedance to order. Mains: 200-250V AC. Size:  $19\frac{1}{4} \times 7\frac{3}{8} \times 6\frac{3}{8}$ in. Weight: 12 $\frac{1}{2}$ lb. Price and full specification on request.

#### GRUNDIG (Great Britain) LTD

Newlands Park, Sydenham, London, SE26. Tel: 01-778 2211.

#### 422 ★

Transistorised stereo mixer for four inputs. Three coarse level controls, directional control and control for reverberation unit. Four microphone preamplifiers fitted. Channel separation 50dB (mic), 35dB (PU). Response: 40Hz-20 kHz  $\pm$  2dB. Powered by two 9V batteries. Size:  $13\frac{1}{4} \times 2\frac{1}{4} \times 7\frac{1}{2}$ in. Price: £35.

#### 420

Mono version of 422 mixer above. Price: £24. Note: Grundig prices include purchase tax where applicable.

#### HARWELL INSTRUMENTS

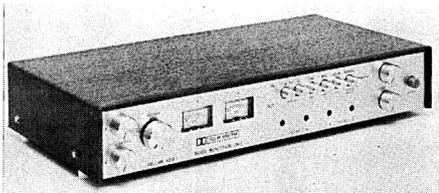
5, 7, 9 Anerley Station Road, London, SE20. Tel: 01-778 9456.

#### Harwell mixer ★

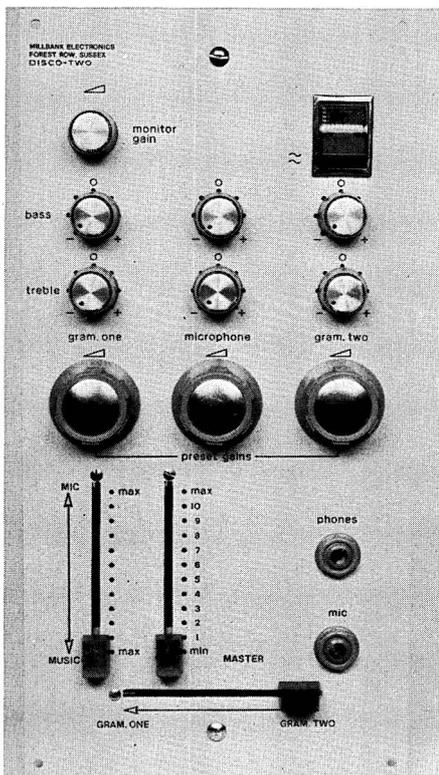
Mono or stereo to order. Silicon semiconductors throughout. Three to six inputs, in standard range, mono or stereo. Gram inputs sensitive enough for any make of magnetic cartridge, equalisation as required. Output: 0.3V RMS



Harwell Mixer Unit in discotheque console



Kellar Electronics KDB-1



Millbank Disco Two

adjustable to drive main amplifier. Outlets for tape recorder and for headphones to provide pre-fade listening. Controls: gain on each channel; master volume, treble, bass, scratch and rumble filters; pre-fade listen volume and selector switch, mains on-off, mono-stereo switch. Indicator light for mains on. AC mains. Monitoring output to headphones from any channel or programme. Size: from 24 x 4½ x 6in (depending on number of channels). Price: from £88 according to required specification.

■ HEATHKIT

See Constructional Kits Section.

■ KELLAR ELECTRONICS LTD

Lopen Works, Lopen Road, Edmonton, London, N18. Tel:

KDB-1 ★

Noise reduction unit employing Dolby 'B' system. Designed for use with domestic recorders for recording and playback. Can be used for replay of commercially recorded tapes and cassettes now available under Dolby B format.

KDB1 connects in circuit between tape unit or recorder and main amplifier. Improvement in signal/noise ratio is 3dB at 600Hz, 6dB at 1200Hz and 10dB for all frequencies above 3kHz. Only low-level signals are treated, being boosted by a preset amount during record and reduced in replay mode by an exactly complementary manner. Separate circuits for each channel.

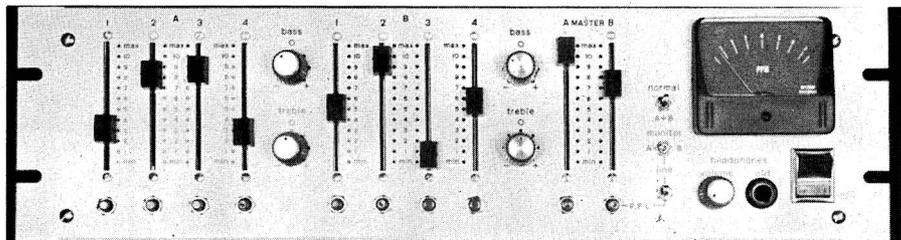
Separate level controls for each channel, plus master overall gain control. MPX filter switch prevents interference from inadequately suppressed stereo carrier and pilot tone frequencies.

Two calibration meters, internal test tone oscillator and special Dolby set-level tape included.

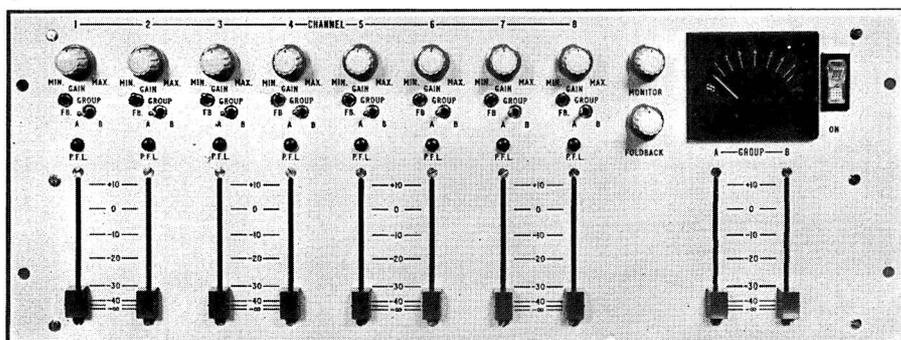
Output: (record) 580mV 50 ohms (5K load); (replay) 580mV 5K (50K load). Levels refer to 'Dolby level' which is 18.5mM/mm for open reel recorders and 20mM/mm for cassette recorders.

Input: (record) 25mV for 580mV output, input impedance 20K. (replay) 25mV for 580mV output, input impedance 30K. HD: <0.1%. FR: (MPX filter out) 20Hz-15kHz ±1dB; 15kHz-20kHz ±2dB. MPX filter: -36dB at 19kHz. Separation: better than 50dB at 1kHz. S/N: better than 70dB reference to 580mV unweighted. Mains: 200-250V 40/60Hz. Regulated power supply. Size: 17 x 3¼ x 9in. Weight: 9¼lb. Finish: simulated black leather finish steel cabinet with brushed aluminium panel and control knobs. Price: £49.50.

★ Indicates entry is illustrated



Millbank MCC Mk II stereo



Richardson Electronics Eight-way Mixer

### ■ LOWTHER MANUFACTURING CO

Lowther House, St Mark's Road, Bromley, Kent, BR29HQ.  
Tel: 01-460 5225. Cables: Lowther, Bromley.

#### Companion Supply Unit No 2

HT and LT power supply suitable to power radio tuners. Pre-amp and tape bias amplifier. Output: 250V at 40mA, 6-3V at 3 amps. Price: £8-75.

#### Companion Supply Unit No 3

HT and LT power supply suitable to power radio tuners. Pre-amp and tape bias amplifier. Output: 350V at 35mA, 6-3V at 3 amps. Price: £8-75.

### ■ MILLBANK ELECTRONICS

The Square, Forest Row, Sussex.  
Tel: Forest Row 2288.

#### Disco Two ★

Transistorised mixer. Three inputs: PU 5-0mV, mic 80µV, PU 5-0mV. Two outlets: 2V 1-5K to 470K, 2V 1-5K to 470K. Controls: preset gains each channel, independent bass and treble for each channel, monitor gain, crossfade mic/music both outlets, PU input crossfade. AC mains. 2W monitor amplifier built-in. Size: 11 7/8 × 6 × 6 1/8 in. Price: (mono) £92-60; (stereo) £138-90.

### MCC Mk II Stereo ★

Mono/stereo transistorised mixer. Maximum inputs: 8. Mag PU 5mV 47K, tape 35mV 47K, mic 200µV 30-200 ohms, 18mV to 11V at 1-5K to 470K impedance (linear). Outlets: two 600 ohms balanced floating. Max +22dBm. Controls: bass, treble, on-off, monitor gain, PFL selection. Linear motion gain each channel. Neon indicator lamp. VU or PPM level meter. Pre-fade/line switched monitoring. Size: 19 × 5 1/2 × 1 1/2 in. Price: (less input or output modules) £142.

### ■ RADON

Radon Industrial Electronics Co. Ltd, Orme Road, Worthing, Sussex.  
Tel: Worthing 34904.

#### DL6/CM ★

Mains operated mono six-channel mixer. Transistors. Six inputs: 1mV 35-100 ohms (high impedance to order). Output: 1V p-p at 6K, 0-25V p-p at 68 ohms. Independent gain control for each input. Mains on-off switch with indicator light. H and N: better than 40dB down. FR: 10Hz-35kHz (level 30Hz-25kHz). Mains: 110-120V 50/60Hz or 220-240V 50Hz. Size: 3 1/2 × 13 × 7 in. Weight: 6 1/2 lb. Finish: satin polished wood cabinet with grey laminate front panel. Price on application.

■ **J. RICHARDSON ELECTRONICS LTD**

57 Jamestown Road, London, NW1.

Tel: 01-267 0723.

**Modular tape amplifiers**

System of pluggable tape record/playback modules. Each module is 7in high and designed to fit into 19in rack. Silicon transistors. Remote electronic switching for four separate equalisations. Modules include; record preamplifier, playback preamplifier, PPM, oscillator, self-sync switching unit, power supply. Full specifications on request. Prices from £35.

**Mixer units ★**

Full range of plug-in mixer modules available separately or in banks of units. Full specifications and prices on request.

■ **SENNHEISER ELECTRONIC**

Distributors: Hayden Laboratories Ltd, East House, Chiltern Avenue, Amersham, Bucks. Tel: Amersham 5511.

Audio equipment showroom, service department and despatch department: 12/13 Poland Street, London, W1V 3DE. Tel: 01-734 3748.

**M101 ★**

Battery operated portable mixer. Inputs: four microphone inputs switchable for 200 ohm dynamic and 12V powered capacitor (MKH series of Sennheiser mics). Output: unbalanced +6dB at 60 ohms. Pre-fade listening using ML101 mixer monitoring unit. PPM. Slider-type faders. Separate bass and treble controls switchable to one channel or to mixed output. Treble control  $\pm 12\text{dB}$  at 15kHz, bass control +10dB -14dB at 40Hz. Power supply: two 9V Ever-Ready cells type 276 or equivalent, or 18V from other equipment. Price: on application.

■ **UHER**

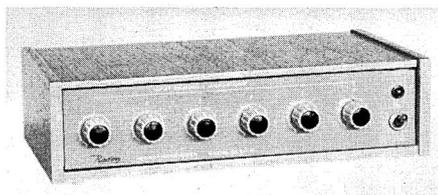
Distributors: Bosch Ltd, Rhodes Way, Radlett Road, Watford, Herts, WD24LB. Tel: Watford 44233.

**A121 ★**

Mixer unit for five channels: two stereo plus one mono or five mono channels. Inputs available for 200 ohm microphone, radio or pickup. Output: 30mV to 1V approx. FR 20Hz-20kHz. Slider faders with directional control, muting switches and 1kHz generator. Powered by PP3 battery. Price: £44.

■ **UNIMIXER**

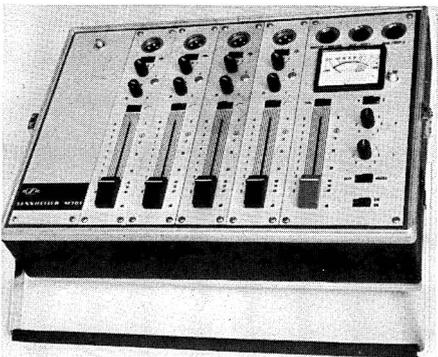
Soundex Ltd, 18 Blenheim Road, Woodstock Road, London, W4. Tel: 01-995 1661.



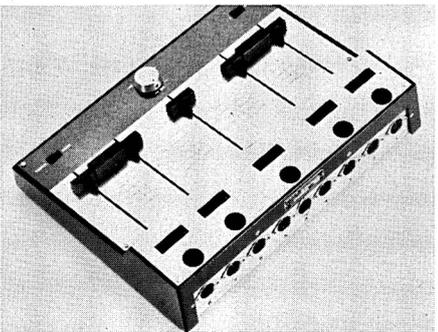
*Radon DL6/CM*



*Richardson Electronics Five-way Mixer*



*Sennheiser M101*



*Uher A121*

★ Indicates entry is illustrated

### Unimixer 4S ★

High quality mixing unit for studios and on location. One stereo pair and two pan controlled mics. Input impedance: 25-600 ohms. S/N ratio greater than 55dB with input signal of 0.18mV at 200 ohms, or 0.07mV at 30 ohms. Individual test certificate. Price: £45.

### Unimixer 4S/P

Similar specification to Unimixer 4S but offering additional facilities. Peak reading level meter (on stereo meter reads greater of two signals). Mains powered: 110-250V AC. Price: £62.

New version of Unimixer being added to range but details of specification not available at time of going to press.

## ■ VORTEXION

257-263 The Broadway, Wimbledon,  
London, SW19. Tel: 01-542 2814 and 6242/4.

### 50/70 ★

All-silicon transistor amplifier with built-in four-channel mixer. Amplifier circuit similar to 100W model described in Amplifier Section. Mixer portion arranged for three 30-60 ohms balanced line inputs and one high impedance input. Separate bass and treble controls. Balanced line 100V output. Sensitivity: 100µV on low impedance inputs, 100mV 100K on high impedance input. 15 ohm output model avail-

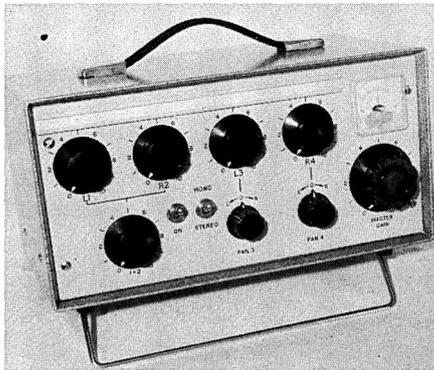
able. Size: 14 × 11½ × 4½in. Weight: 22lb. Price: £75.

### 50/70 plus 5-way mixer

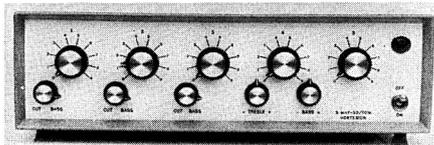
Similar specification to 50/70 with four channel mixer, but with additional bass-cut controls on three low impedance inputs. Inputs: three 100µV 30-60 ohms balanced, 100mV 10 meg-ohms, 100mV 100K. Size: 14 × 11½ × 2½in. Weight: 22lb. Price: £84.

### FET mixers

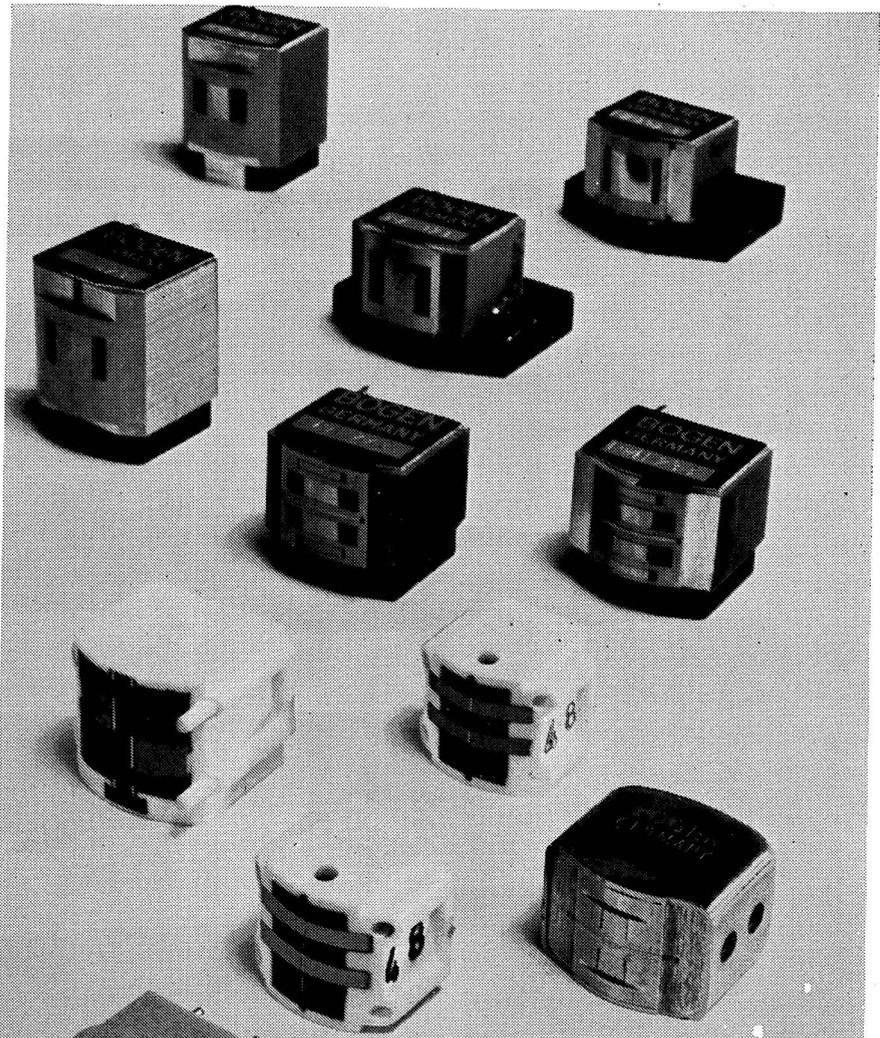
Range of professional standard four-channel mono and four- and five-channel stereo mixers incorporating peak programme meters. Response from 20Hz-30kHz. Available with 3W or 15W built-in amplifiers for monitoring. Prices from £50 for four-way mono mixer, to £168 for five-channel stereo mixer with two PPMs.



Unimixer 4S



Vortexion 50/70



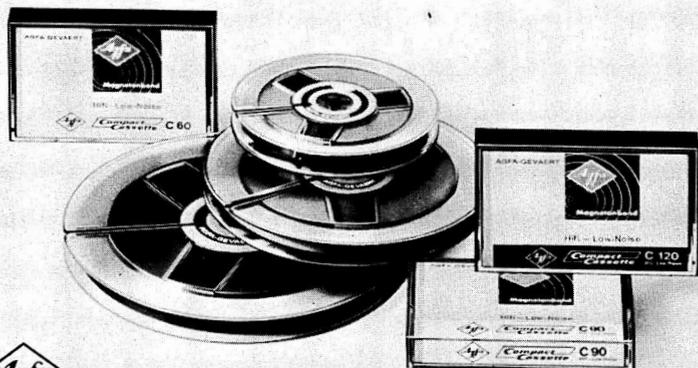
# BOGEN BETTER TAPE HEADS

**cole**

SOLE U.K. AGENTS  
COLE ELECTRONICS LTD.  
LANSDOWNE ROAD  
CROYDON CR9 2HB  
TEL: 01-686 7581 TELEX: 262346

**For those who like to  
hear the sound  
of their own voice-**

## **Agfa Magneton Tape**



**AGFA-GEVAERT**

# Tape Accessories/ Components

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ ACOS

Cosmocord Ltd, Eleanor Cross Road,  
Waltham Cross, Herts.

Tel: Waltham Cross 27331.

## R.E.6

Magnetic earpiece made in four impedances and colour coded: green 10 ohms, blue 150 ohms, violet 300 ohms and red 1,000 ohms. Each earpiece is fitted with a 3.5mm jack plug. Price: 62½p.

## Acos Stethoset

For personal listening with 6ft of lead. Price: £1.45.

## ■ ADASTRA ELECTRONICS LTD

Unit 22, Cricklewood Trading Estate,  
Claremont Road, London, NW21TU.  
Tel: 01-452 6288 (answering service 01-452 6289).

## Imp-Verta

Matches low impedance tape heads, PU cartridges and microphones into high impedance amplifier inputs. Solid state printed circuit device using silicon transistor. Automatically switched 9V internal battery. Negligible drain. Conversion factor approximately 20 (depending on load). Virtually no hum or signal loss. Metal case, finished black crackle. Size: 5 × 1½ × 1½in. Price: £3.50.

## Tape Editing Kit

See entry under Synchronotape.

## ■ AGFA GEVAERT

Agfa-Gevaert Ltd, Unity House,  
Great West Road, Brentford, Middlesex.  
Tel: 01-560 2131 (20 lines). Telex: 28154.

## Editing accessory kit ★

Price: £1.69.

## Splicing Tape Dispenser

Price: 37p.

## Novodur Plastic Library Boxes

Prices: 4½in and 5in 41p; 5½in 51p; 7in 61½p.

## Plastic Spools

Prices: 3in 18½p; 4in and 4½in 20p; 5in 26p; 5½in 26p; 7in 28p; 8½in 67p; 10in 76p; 10½in £1.58.

## Splicing tape ★

33ft of ¼in, 22p.

## Leadtape

80ft of ¼in, red, green, white, yellow 22p.

## Silver Stop Foil

33ft of ¼in, 37p.

## ■ AMOS OF EXETER LTD

Weircliffe Court, Exwick, Exeter.

Tel: Exeter 72132. Cables: Amos, Exeter.

## Weircliffe Bulk Erasers

Models 6, 7, and 8. Model 6 accepts reels up to 8½in diameter of ¼in tape. Capacity 180-400 reels per hour. Model 7 accepts 8 × 8in cassettes of ¼in tape. Model 8 accepts reels of up to 14½in diameter containing tape from ¼in audio up to 2in video including ½in and 1in instrument tape and 16 and 35mm film. Capacity 100-400 reels per hour (NATO catalogue No. 5835-99-972-5371). Sizes: (Models 6 and 7) 11½ × 12¼ × 7½in. Weight: 431b. Size: (Model 8) 20½ × 20½ × 10½in. Weight: 921b. Prices: (Models 6 and 7) £46; (Model 8) £135; (Model 9) £210. Models available for 115V 60Hz.

## ■ BANG & OLUFSEN UK LTD

Eastbrook Road, Gloucester, GL47DE.

Tel: Gloucester 21591.

## Beocord Trolley 3019 and 4009

Pedestal stand with cruciform base and castors. Designed for Beocord 1800 and 2400 tape recorder and tape unit. Price: (trolley 3019) £11.90 (including PT); (top 4009) £2.50 (including PT).

## 4001 Synchro Box ★

For synchronising slide projector to tape recorder. Records projector control pulses on one track while commentary is recorded on second track. On playback the control pulse is read and shaped to length required by the projector. Price: £29.90 (including PT).

## 6001

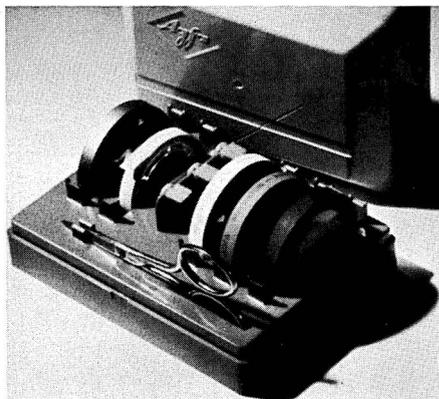
Line transformer for coupling low-impedance microphone into high impedance tape recorder input. Five-pin DIN socket at one end, three-pin DIN plug at the other. Matches into 50K input. Fully screened. Price: £3.90.

## 4036

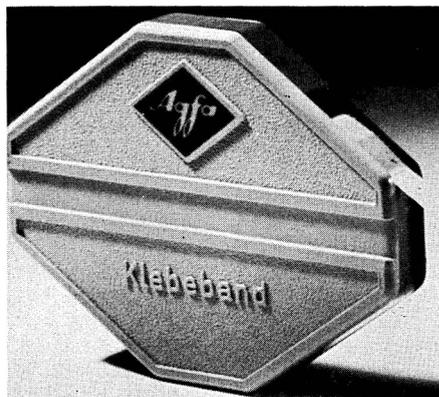
Microphone preamplifier. Input: balanced 35µV 50-200 ohms. Price: £11.50.

## 4037

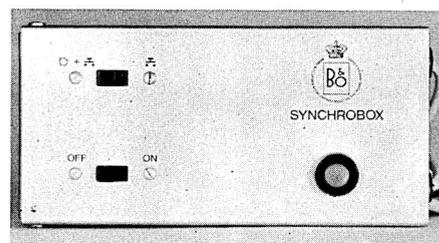
Pickup preamplifier. Sensitivity: (switched) 1-5 mV 47K for mag PU, 50mV 10 megohms for ceramic PU. Price: £7.90.



Agfa Tape Editing Kit



Agfa Splicing Tape Dispenser



Bang & Olufsen 4001 Synchrobox



Bib splicer

**4038**

Tuner preamplifier. Sensitivity: (switched) 2.5 mV 47K, 50mV 100K. Price: £7.90.

■ **BASF UNITED KINGDOM LTD**

Audio/Video Tapes Division, PO Box 473, Knightsbridge House, 197 Knightsbridge, London, SW7. Tel: 01-584 5080. Telex: 267574/5.

**Special requirement tapes**

SP 52 8½in 1,800ft £3. LP 35 8½in 2,400ft £3.80; 10in 3,600ft £5.60; 10½in 4,200ft £6.25. LP 35 LH 8½in 2,400ft £4.10; 10in 3,280ft £5.60; 10½in 4,200ft £6.95.

**Technical-look spools**

Standard sizes: 2½in 19p; 3in 17p; 3½in 19p; 4in 19p; 4½in 19p; 5in 22p; 5½in 24p; 7in 25p; 8½in 57p; 8¾in 57p; 10in 70p; 10½in £1.18.

**Leader Tape**

Green, red or white. Plastic centre spool. 984ft £1.50; 80ft 25p.

**Splicing Tape**

33ft ½in white 37p; 33ft 0.7in white 57p.

**Splicing Set**

Plastic box with bonding groove and 33ft of splicing tape 33p.

**Metallised Foil**

For automatic stop or track change. 82ft ¼in sputtered silver £1.

**Leader Tape Set**

Containing red and green leader tapes, 25 strips of metallised foil and spare spool labels 50p.

**Adhesive LG**

Splicing fluid for PVC base tape: 1oz bottle 37p. (Cannot be sent by post).

**Plastic Tape Clips**

Box of 10 13p.

■ **BIB**

Multicore Solders Ltd, Bib Division, Multicore Works, Maylands Avenue, Hemel Hempstead, Herts. Tel: Hemel Hempstead 3636.

**Tape Head Cleaning Kit**

Comprises: bottle of Bib non-inflammable tape head cleaner, two tape head applicator tools (blue), two tape head polisher tools (white), 10 applicator and polisher sticks, cleaning cloth and plastic wallet. Price: 49p.

**Recording Tape Splicer ★**

Model 20. For use with ¼in or 6.3mm tape of any thickness. Chrome finished clamps for holding tape. Makes diagonal or butt splices. Non-slip base. Complete with razor cutter and instructions. Price: 99p.



**Model 21**

Special larger version of Model 20. Designed for editing and splicing  $\frac{1}{2}$ in video tape. Four razor cutters and cleaning kit included. Price: £9.50.

**Tape Editing Kit**

Model 23. Kit contains tape splicer for  $\frac{1}{4}$ in or 6.3mm tape, 12 tape reel labels, razor cutter, splicing tape, tape marker, instruction leaflet and plastic wallet. Price: £13.6.



**Cassette tape editing kit ★**

Model 24. Enables cassette tapes to be edited quickly and easily. Kit contains cassette tape splicer ( $\frac{1}{4}$ in or 3.2mm), two precision tape cutters, tape piercer, 10 self-adhesive cassette and container labels, reel splicing tape, three tape winders and removers (two spares), instruction leaflet and plastic wallet. Price: £15.50.

**Precision tape cutters**

Model M. Set of four stainless steel cutters with special plastic grips for all types of magnetic recording tape. Price: 23p.

**Tape reel labels ★**

Self-adhesive labels printed with spaces for title, composer, date, type of tape and number. On backing paper in sheet form so that details can be easily filled in by typewriter or pen. Prices:

*Bib cassette tape editing kit*



size T/1 (reel labels) 20 for 10p; size T/2 (tape box labels) 20 for 10p; size T/3 (cassette and container labels) 20 for 10p.

**Anti-static Cleaner**

Non-inflammable anti-static fluid with cleaning cloth. Does not smear or scratch. Suitable for instrument panels, plastic, chrome, glass and exteriors of electronic equipment. Price: 22½p.

**Cassette head cleaning tape ★**

Special tape incorporated in Compact cassette for cleaning heads, capstan and pinch wheel in one operation. Suitable for all cassette recorders and players. Price: 53p.

**Splicing tape**

On handy plastic dispenser. Suitable for  $\frac{1}{8}$ in and  $\frac{1}{4}$ in tapes. Price: 23p.

*Bib tape and cassette labels*

**Cassette recorder care kit**

Kit contained in plastic box comprising  $\frac{1}{4}$ in splicer, splicing tape, tape piercer, 10 cassette labels, three tape winders, two tape cutters, polishing cloth and cassette cleaning tape. Price: £2.

**Cassette salvage kit**

Enables welded cassette cases to be opened and tape joined using Model 24 kit. Comprises instructions, razor cutter, two tape winders and new cassette. Price: 44p.

**Cassette cases**

Solid case covered in simulated deerskin PVC. Designed to hold 12 tape cassettes. Lid secured by two button fasteners. Price: 96p.

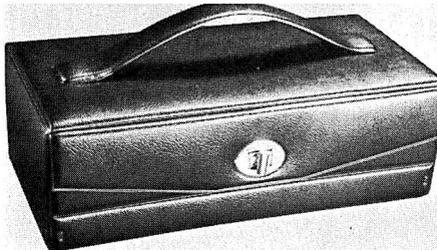


*Bib Cleaning Tape*

★ Indicates entry is illustrated

**Luxury cassette case ★**

Padded cassette case to hold 12. Designed for easy withdrawal and replacement. Easy opening lid and fitted with carry handle. Price: £1.58.



*Bib Luxury Cassette Case*

**BLACK KNIGHT RUMBLECURE**

Bank Top, Currier Lane, Ashton-under-Lyne, Lancs. Tel: 061 330 2836 (24-hour service).

Specialists in curing rumble due to acoustic feedback through floors and cabinets.

Kits and items designed to isolate and acoustically damp pickup arms, turntables, motor units, plinth assemblies, tape recorders, speaker enclosures and other audio equipment.

Plinths fitted with Rumblecure equipment available. Details on request. Many standard items now available and more being added all the time. Quotations on receipt of full details of equipment.

**BRITISH RADIO CORPORATION LTD**

Thorn House, Upper St Martin's Lane, London, WC2. Tel: 01-836 2444.

**Synchro-amp adaptor TA/01**

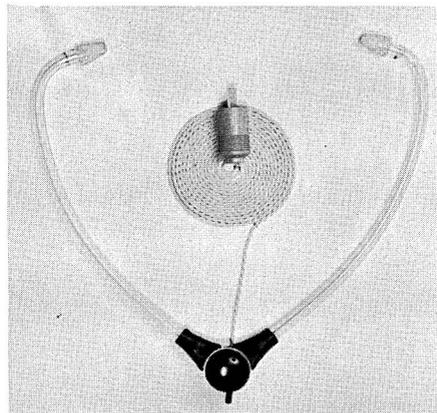
Pre-amplifier unit for second channel stereo playback. Monitoring one track whilst recording on another. Automatic slide projector synchronisation. For models using D842 and DC43 decks only. Price on application.

**Foot switch TA/19**

Facilitates use of recorder as dictating machine. Recorder runs when switch is depressed. For models with remote pause facility. Price: £2.78.

**Monitoring Stethoset TA/15 ★**

Stethoscope type earpiece to monitor programme during recording. Fitted with Continental speaker plug. Price: £1.53.



*British Radio Corporation Stethoset TA/15*

**Preamplifier TA/27**

For providing stereo playback and second channel monitoring with four-track recorders. Price: £8.65.

**Slide Projector Synchroniser TA/28**

For operating slide change on projectors having a remote control. Used with ¼-track recorders. Price: £9.30.

**Stereo headphones TA/39**

General purpose stereo headphones. Fitted with ¾in standard jackplug. Price on application.

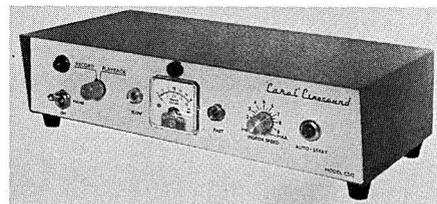
The tape recorder accessories listed above are primarily for use with machines marketed under the Thorn brand names Ferguson and Marconi-phonc.



*Colton Gripex*

**COLTON**

Musonic Ltd, 34-38 Verulam Road, St Albans, Herts. Tel: St Albans 50611/2.



*Carol Cinesound (Contronics)*

**Gripex ★**

Anti-slip dressing. A spirit suspended solution supplied in 1fl oz bottles with brush. Applied thinly to drive surface of belts or friction wheels, it dries in 10-15 minutes. Price: 25p per bottle.

**Tape storage rack**

Constructed in heavy gaugewelded wire finished in black polythene with matching or contrasting feet. May be used for tapes and books. Accommodation for 21 tapes. Sliding 'tidy' keeps tapes upright when smaller quantity stored. Price: £1.05 (plus 10p PT).

See also pickup accessory section.

**■ CONTRONICS LTD**

Garth Works, Deepcut Bridge Road, Blackdown, Camberley, Surrey.  
Tel: Deepcut 5936.

**Carol Cinesound ★**

Tape/film, tape/slide synchronisers enable home movies to be made with sound. The Carol Cinesound completes a sound system between the projector and tape recorder. There are three models.

**Model R.1**

Record only unit for projectors or cameras. In a cream plastic case, size  $4 \times 2 \times 1\frac{1}{8}$ in, it uses a 22.5V Ever Ready B122 battery and weighs  $5\frac{1}{2}$ oz complete. Pulse input: miniature jack socket. Output to tape recorder: DIN 3-way socket. Accessories included. Price: £9 (plus £3.17 PT).

**Model P.1**

Playback only unit for projectors. Mains operated in a steel case, size  $5\frac{1}{2} \times 3 \times 3$ in, weighing 2lb 2oz. Projector control in/out switch. Tape input: DIN 3-way socket. Pulse input: miniature jack socket. Mains input: 3-pin fixed plug. Projector socket: 8-pin octal socket. Accessories included. Price: £11.25 (plus £3.97 PT).

**Model CS/2**

Record/playback unit. Mains unit operated. Steel housing finished in grey and off-white stove enamel measuring  $12 \times 7 \times 3\frac{1}{2}$ in. 23 silicon transistors and 15 silicon diodes. Control circuit operated via isolating transformer driving a silicon controlled rectifier in the motor control circuit. Price: £34.50 (plus £12.18 PT).

■ **COSMOCORD** See Acos.

■ **DRY-SPLICE** See Lennard Developments.

**■ EAGLE INTERNATIONAL**

Heather Park Drive, Wembley, HAI1SU.  
Tel: 01-903 0144.

**TD.79 Tape Head Demagnetiser**

250V mains operation. Price: £1.50 (plus 35p PT).

**T.635 Tape Splicer**

Complete with cutting and trimming blades. Price: 88p (plus 22p PT).

**■ EMI TAPE LTD**

Blyth Road, Hayes, Middlesex.  
Tel: 01-573 3888. Telex: 22417.

**Plastic spools**

In cartons: 4in 20p; 5in 21p;  $5\frac{1}{2}$ in 23p; 7in 26p. In self-standing dust-proof plastic library cases with index. 3in. 17½p; 4in 28½p; 5in 35p;  $5\frac{1}{2}$ in 35p; 7in 42p.

**AP123 Jointing Block**

Professional non-magnetic jointing block for precision splicing at 45° or 90°. Price: 52½p.

**AP38 Coloured Leader Tape**

Approximately 150ft in plastic dispenser. Range of seven colours as follows: white, red, yellow, blue, orange, green, grey. Price: (per reel) 22½p.

**Jointing Tape**

Adhesive polyester tape specially prepared for splicing. Approximately 30ft in plastic dispenser. Type AP102 ( $\frac{3}{4}$ in wide) 24p; type AP103 ( $\frac{1}{2}$ in wide) 37½p.

**AP125 Stop Foil**

Metallic stop foil on 50ft reels in plastic dispenser. Sufficient for 50 tapes. Price: 32½p.

**AP124 Accessory Kit**

Kit for splicing and editing. Contains three dispensers of leader tape, one of stop foil, one of jointing tape, jointing block and two cutters. In plastic tray with two spare compartments for additions. Price: £1.87½.

**■ FERROGRAPH CO LTD**

The Hyde, Edgware Road, Colindale, London, NW9. Tel: 01-205 2241.

**Head lift transformers**

Suitable for FP17, FR7A and CL7 heads. Price: £2.60.

**Defluxer**

For depolarising heads, capstans and guides. Ensures maximum signal/noise ratio. Prevents hiss and protects tapes from cumulative background noise. Price: £5 (including PT).

**Tape heads**

FP16 stereo stacked. Price: £13.51. FR7A upper track. Price: £9.38. CL7 lower track. Price: £9.38.

**Carrying case**

Waterproof canvas case with zip fastener. Price: £7.54 (including PT).

★ Indicates entry is illustrated

### Plugs

JPS-401 screened plug with aluminium body and cable clamp. Price: 34p.

### Endless loop cassette

Permits Ferrograph to be operated continuously on an endless loop of 8 mins duration at  $7\frac{1}{2}$ i/s. Price: £8.80 (including PT).

### Ferrotape spools

Aluminium, anodised grey. Prices: 7in £1.17; 8½in £1.31.

## ■ GRAMPIAN REPRODUCERS LTD

Hanworth Trading Estate, Feltham, Middx.  
Tel: 01-894 9141. Cables: Reamp, Feltham.

### Grampian G.7 ★

Matching units, consisting of double-wound transformer in a Mu-metal case with jack socket on the primary and a screened lead on the secondary. Dimensions:  $3\frac{3}{8} \times 1\frac{1}{4}$ in diameter. Versions available for matching 15/30 ohms, 600 ohms and 50,000 ohms or greater. Price: £5.20.

### Grampian Parabolic Reflector ★

Diameter 24in, depth 5in. Gain 14dB over range of 500c/s to 5,000c/s. To take Grampian DP4 and DP6 mics. Weight: 4½lb. Price: £9.80.

### Grampian Reverberation Unit

Self-contained portable unit, transistorised and operated from internal dry batteries. Independent input channels, low level and high level. Output 1V, 600 ohms. Size (including detachable lid):  $17\frac{1}{2} \times 5\frac{1}{2} \times 6\frac{1}{4}$ in. Weight: 12lb. Price: £67 (batteries extra). Mains unit available.

## ■ GRUNDIG (Great Britain) LTD

Newlands Park, Sydenham, London, SE26.  
Tel: 01-778 2211.

### Sona Dia ★

Designed to synchronise a tape recorder with automatic slide change projector. Records and reads control pulse on lower ¼-track. Pulse frequency 100Hz. Power consumption 3W. Price: £19.36 (including PT).

## ■ JOHN HORWITZ

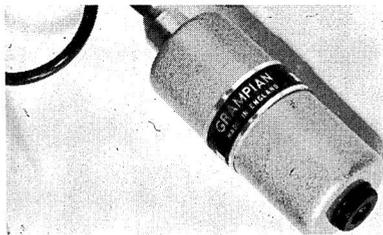
305 Kenton Road, Kenton,  
Harrow, Middlesex. Tel: 01-907 6667.

### Stereo stamp

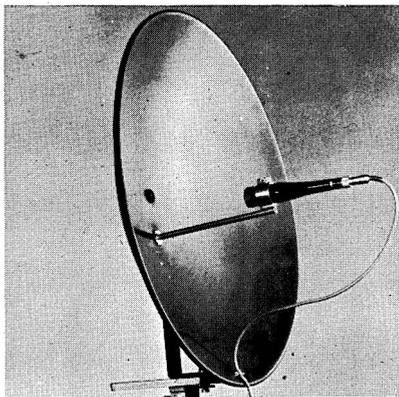
Small rubber stamp to enable tape enthusiasts who record in stereo to label their tapes, making them instantly visible. Price: 40p including postage.

## ■ KOSS

Tape Music Distributors Ltd,  
11 Redvers Road, London, N22.  
Tel: 01-888 0152.



Grampian G7 matching unit



Grampian parabolic reflector

### T-1

Monitoring box for tapes from high impedance sources, such as tape recorders with pre-amps only. Impedance matching transformers: 600-10,000 ohm output. Equipped with two output jacks for stereophones and two RCA-type input jacks. Price: £4.50.

### T-5

Remote control station provides stereophone and speaker control from remote location. Jacks for two sets of stereophones. Left and right channel volume controls and speaker on-off switch. Metal cabinet. Price: £5.

## ■ LEEVERS-RICH EQUIPMENT LTD

319 Trinity Road, Wandsworth, London, SW18.  
Tel: 01-874 9054/6.  
Cables: Leemag, London, SW18.

### Leeraser LR70, LR71 ★

Bulk tape demagnetisers. Model LR70 for tapes up to 8½in diameter. Price: £18. Model LR71 for tapes up to 11½in diameter. Price: £28.

## ■ LENNARD DEVELOPMENTS LTD

Lockfield Avenue, Brimsdown, Middlesex.  
Tel: 01-804 8141.

**Dry-Splice**

Precut adhesive tape for splicing and mending without the aid of a splicing block. Envelopes of 24. Price: 19p.

■ **MASTERTAPE (MAGNETIC) LTD**

Blackthorne Road, Poyle Trading Estate, Colnbrook, Bucks, SL30AQ..

Tel: Colnbrook 2431.

**Splicing Kit**

Contents: 5 reels leader, 1 reel metallic, 1 reel adhesive, plastic splicer. Price: £1-30.

**Leader Tapes**

45ft; colours, red, white, blue, green, yellow. Price: (per reel) 13p.

**Plastic Tape Clips**

25 per packet. Price: 13p.

**Metallic foil**

20ft reel. Price: 23p.

**Adhesive tape**

18ft reel. Price: 23p.

**Empty spools (boxed)**

3in 14p; 4in 19p; 5in 21p; 5½in 23p; 7in 26p; 8½in 34p.

**Cassettes**

C.60 35p; C.90 87p; C.120 £1-38.

■ **METROSOUND**

Metrosound Manufacturing Co Ltd, Cartersfield Road, Waltham Abbey, Essex. Tel: Waltham Cross 31933.

**M.1 Metro-Splicer**

Nylon block impervious to joining compounds, interchangeable guides and channels for use with 8mm films. Supplied with spare cutter blades and emulsion scraper. Price: 85p (plus 21p PT).

**M.4 Klentzape kit**

Patented head cleaner. Kit comprises ribbed cleaning tape, two special spools and bottle of Klentzape fluid. Price: 70p (plus 17p PT).

**M.7 Tape accessory kit**

Comprising Metro-Splicer, Klentzape kit, Metro-brush on display card. Price: £1-63 (plus 40p PT).

**M.9 Metro-Brush ★**

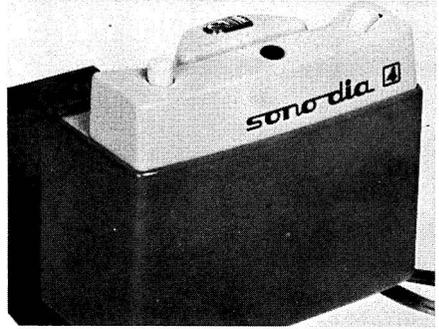
Designed for use with tape recorders for cleaning all surfaces except tape head. Soft nylon with plastic handle. Price: 15p (plus 4p PT).

**M.12 Metro-Strobe ★**

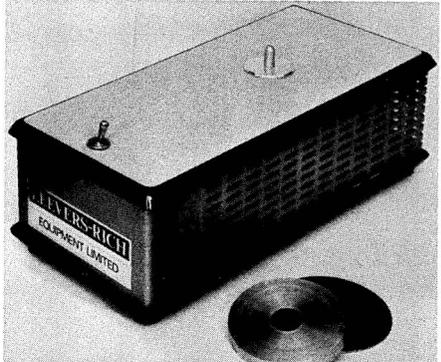
Stroboscope for checking accuracy of tape recorders on all speeds at 50Hz and 60Hz. Price: 63p (plus 15p PT).

**M.16 Tape Recorder Mechanical Maintenance Kit**

Presentation pack with Metro-Strobe, lubri-



Grundig Sona Dia



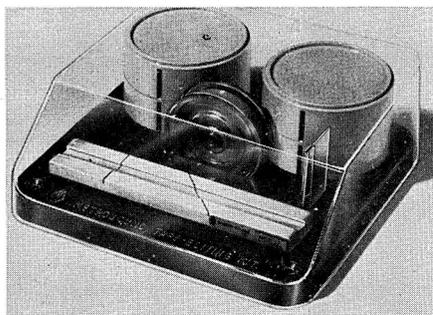
Leavers-Rich LR71



Metro-sound cleaning brush



Metro-sound stroboscope



Metrosound M25 editing kit

cating kit, Klensatape kit, supply of cleaning pads, Metro-Brush. Price: £2 (plus 49p PT).

#### **Metro-Splicing Block**

Professional precision metal splicing block for  $\frac{1}{4}$ in tape, supplied with non-magnetic cutter blade. Price: 50p.

#### **M.18 Leader tapes**

Choice of six colours, approximately 40ft of leader tape, wound on to plastic mini-spool. Price: 23p each.

#### **M.19 Stop foil**

Metallic tape for actuating electronic auto stop mechanisms for tape recorders. Approximately 15ft on mini-spool. Price: 23p.

#### **M.20 Jointing tape**

$\frac{1}{4}$ in wide, approximately 12ft on mini-spool. Price: 23p.

#### **M.23 Spirit level**

Plastic spirit level for tape recorders and turntables, etc. Price: 35p.

#### **M.24 Lubricating Kit**

Suitable for tape recorders and mechanical moving parts. Comprises small bottle of each of R.O.B. and R.O.G. oil and container of Starfax. Price: 35p.

#### **M.25 Tape Editing Kit ★**

Comprises splicing block and cutter, one reel stop foil, one reel jointing tape; three assorted coloured leaders in cassettes with transparent dust cover, mounted on plastic base with soft plastic feet and supplied with fixing screws for bench use. Price: £1.50.

#### **M.32 Cassette Head Cleaner**

Same size as Philips Compact Cassette. Non-abrasive. Cleans and polishes record and erase heads. For all recorders and tape players using Philips type cassettes. Price: 45p (plus 11p PT).

#### **M.30 Accessory Rack**

For radio and audio retailers. Wire display rack with assortment of Metrosound accessories in packs. Full details and prices on request.

#### **M.33 C60 Blank Cassette**

Price: 53p (plus 10p PT).

#### **M.34 Ioniser fluid**

Price: (pack of 10) 25p.

#### ■ MULTICORE See Bib.

#### ■ OSMABET LTD

46 Kenilworth Road, Edgware, Middlesex.

Tel: 01-958 9314.

#### **'Instant' Bulk Tape Eraser and Recording Head Demagnetizer**

Operates from AC mains to provide rapid and complete erase of tapes and cassettes prior to making quality recordings. Weight: 18oz. Price: £2.40.

#### ■ PHILIPS ELECTRICAL LTD

Century House, Shaftesbury Avenue, London, WC2.

Tel: 01-437 7777. Cables: Philamps, London.

#### **EL3787A Pre-Amplifier**

Designed for use with Philips  $\frac{1}{4}$ -track mono mains-operated recorders which have stereo socket and first-stage input transistor circuit. EL3787A with additional equipment offers play-back of pre-recorded stereo tapes, du-play (playback of one track while recording on parallel track) and multi-play (copying from one track to another and simultaneously adding an accompaniment). Price: £7.36 (plus £1.94 PT).

#### **EL1995/N6400 Slide Synchroniser**

For use with most tape recorders and automatic slide projectors (max voltage 30V, max current 1A). Supply: 9V battery. Price: £14.69 (plus £3.46 PT).

#### **N6502**

Mains supply unit. Inputs: 110-245V (switchable). Outputs: 6V, 7.5V and 9V (switchable). For use with Philips battery tape recorders and radios fitted with appropriate socket. Price: £5.25.

#### **EL 1901/50 Splicing Kit**

Contains white, green, red and blue leader tape, switching foil, adhesive tape, adhesive labels, cutting blade, splicing jig and instructions. Contained in plastic case. Price: £1.38.

#### **Stethoscope headphones**

Various models for use with Philips recorders. Price: (mono EL3775/85) £3.60; (stereo EL3775/38) £5.75; (LBB9900/50) £8.50.

#### **Empty spools in cardboard boxes**

3in 18p; 4in 20p; 5in 23p; 5 $\frac{1}{2}$ in 25p; 7in 28p.

#### **In library cases**

3in 25p; 4in 28p; 5in 33p; 5 $\frac{1}{2}$ in 35p; 7in 43p.

#### **Library cases**

3in 10p; 4in 14p; 5in 18p; 5 $\frac{1}{2}$ in 21p; 7in 25p.

**ET 4743/00**

Compact cassette box. Price: 4p.

**ET 4744/00**

Library rack. Price: 9p.

**Cassette Cleaning Tape**

Price: 89p.

**N6705 and N2202**

Car mounting unit for models EL3300, 3301, 3301T, 3302 tape recorders. 6V or 12V, positive or negative earth (negative earth only with N2202). Price: £15-70.

**EL/1900 Leader Tape**

LT10 (white), LT20 (green), LT30 (red). Price: 13p per reel.

**EL3880/50 Switch foil**

Price: 15p.

**EL3916/10 Jointing tape**

Price: 30p.

■ **SCOTCH**

Minnesota Mining and Manufacturing Ltd, 3M House, Wigmore Street, London, W1. Tel: 01-486 5522.

**No. 41 Splicing Tape**

A white pressure sensitive adhesive tape specifically designed for splicing magnetic tape.  $\frac{1}{2}$ in  $\times$  50 in 18p;  $\frac{1}{2}$ in  $\times$  66ft 33p;  $\frac{3}{4}$ in  $\times$  66ft 23p.

**One-Five Special**

Send a letter on tape. You can talk for up to thirty minutes on a SCOTCH One-Five Special. The 3in reel fits all spool type tape recorders. Handy pack is specially designed for easy posting. Price: 27p.

**No. 51 Sensing Tape**

For recorders with electric sensing controls. A flexible and strong conductive foil tape with a pressure sensitive adhesive that sticks tight and stays clean. The sensing tape adheres to the dull side of the recording tape so that it falls inwards when wound on the spool. Price: 70p.

**Accessory Kit**

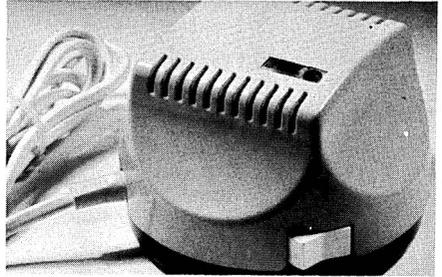
A slim pocket-size kit for outside work or 'on-the-spot' editing. The accessory kit contains: splicer, No. 41 splicing tape on a dispenser, No. 24 white leader tape, in handy pack with cutter, ten tape clips. Price: £1-73.

**Tape Clips**

For holding tape secure on a spool and preventing spilling or tangling in storage, handling and shipment. Available in packets of ten. Price: (per packet) 13p.

**Empty Spools**

Made of strong, high-quality plastic. Available in all popular reel sizes each individually boxed and with a slot to allow easy tape threading.



TRS Mains Unit Audio Pack 442

Slot is calibrated in larger sizes. Price: 3in 16p; 4in 19p; 5in 22p; 5 $\frac{1}{4}$ in 24p; 7in 25p.

**No. 24 Leader Tape**

Used to identify ends of tape and sections within a reel. Supplied in red, yellow, white, green and blue.  $\frac{1}{4}$ in  $\times$  50ft. Price: 10p.

■ **SYNCHROTAPE**

Sole Distributors: Adastr Electronics Ltd, Unit 22, Cricklewood Trading Estate, Clarendon Road, London, NW21 1TU. Tel: 01-452 6288 (answering service 01-452 6289).

**Synchrotape Editing Kit**

Instant cut and trim splicer, four reels coloured leader tape, one reel metallic stop foil, one reel adhesive tape, six coloured tape-securing clips and 28 self-adhesive titling labels. Presented in see-through crush-proof carton. Complete with 12-page instruction and information booklet. Price: £1-50 (plus 36p PT).

■ **TAPE RECORDER SPARES LTD**

Harmsworth House, 9 Harmsworth Street, London, SE17. Tel: 01-735 9683.

**Audio Packs**

Pre-packed spares and audio accessories.

**Connecting cords**

Cables of various types with plugs, sockets and other terminations covering all equipment in use for domestic audio.

**Adaptors**

Convert from any type of plug or socket termination to any other type.

**Audio Spares**

Plugs, sockets, chassis mounted components, fuses and audio accessories. Pre-packed for counter or showroom display.

**Mains units ★**

Three different 6-12V battery eliminators complete with connecting leads for use with all standard battery-operated tape recorders and radios. Full specifications on request.

★ Indicates entry is illustrated



Valradio Transverter B12/2005

### ■ TELEFUNKEN

Distributor: A.E.G. (Great Britain) Ltd, AEG House, Chichester Rents, Chancery Lane, London, WC2. Tel: 01-242 9944.

#### Telefunken Endless Tape Cassette

Price: £3.36 (plus 83p PT).

### ■ TUTCHINGS ELECTRONICS LTD

14 Rook Hill Road, Friars Cliff, Christchurch, Hants. Tel: Highcliffe 2019.

#### Tapesponder's kit

Magnetic rubber for completely erasing tape; and 40ft of white noise azimuth tape. Price: 25p, including postage.

### ■ UHER

Distributors: Bosch Ltd, Rhodes Way, Radlett Road, Watford, Herts, WD24LB. Tel: Watford 44233.

#### W211

Midget earphones. Price: £2.30.

#### W911

Stethoclip for W211 earphones. £1.40.

#### Uher A401 Timer

Self-starting synchronous clock mechanism with hour and minute hands. A third hand indicates time over a 24-hour period (i.e. operates at half speed of normal hour hand). This third hand operates switch striker.

72 selectors round perimeter of clock, spaced at 20-minute intervals, permit on-off-on-off switching in sequence, i.e. up to 36 on and 36 off operations within every 24-hour period. Accuracy is  $\pm$  two minutes of the set time. Price: £14.35.

#### Z124

Mains unit/charger designed to operate models 1000 Pilot, 4000L, 4200/4400 from 110/240V AC mains, or to recharge Dryfit battery (Z212) or nickel cadmium battery (Z214). Price: £17.73 (including PT).

#### Z212, Z214

Accumulator (Z212) and nickel cadmium battery (Z214). Designed to fit into models 1000 Pilot, 4000L, 4200/4400. Capacity: approx 2.5

AH. Running time per charge: approx 4-5 hours. Prices: (Z212) £6.85; (Z214) £13.70.

### ■ VALRADIO LTD

Browells Lane, Feltham, Middlesex.

Tel: 01-890 4837/4242.

Service agents: Vibro Supply, 57 Fortress Road, London, NW5. Tel: 01-485 5165.

#### DC converters

Designed for operating tape recorders and similar mains equipment from ship's supply of 220V DC. Prices from £20.85.

#### Transverter B12/30S

Input 12V DC. Output 50Hz  $\pm$  1/2 Hz sine wave at 30W. Suitable for positive or negative earthed input. Built-in switch and socket. Supplied complete with input lead. Size: 8 x 6 x 6 in. Weight: 8lb. Price: £29.50.

#### Transverter B12/120S

Input 12V DC. Output: 115-230V 50Hz  $\pm$  1/2 Hz sine wave at 120W. Price: £51.80.

#### Transverter B12/200 ★

Input 12V DC. Output: 115-230V 50Hz  $\pm$  1/2 Hz sine wave at 200W. Price: £74.35.

#### Frequency changer

AC-AC. Suitable for records, films, television programme special effects. Prices: (100W) from £35.55; (200W) from £57.

### ■ WAL

Sole distributor: A. C. Farnell Ltd, Consumer Division, Farnell House, 81 Kirkstall Road, Leeds, LS31HR. Tel: Leeds 35111.

#### WAL Hi-Gain pre-amplifier

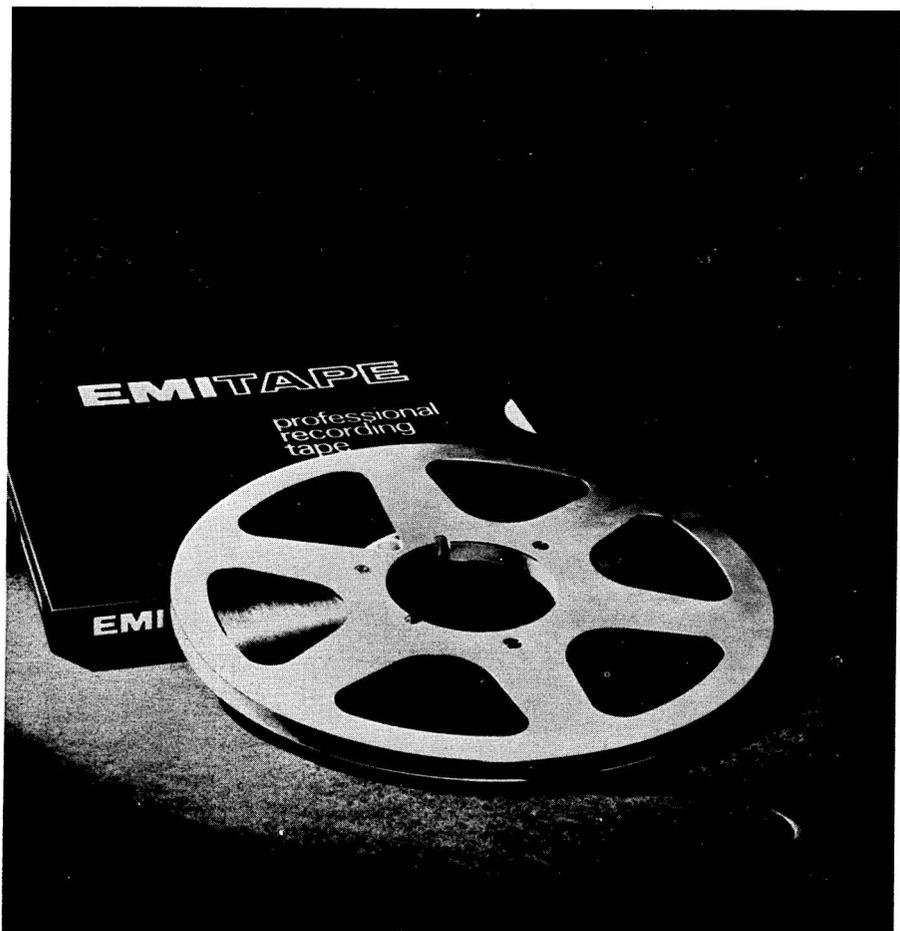
Mono transistorised battery operated preamplifier with high amplification and built-in tape equalisation (CCIR at 7 1/2 i/s) for playback direct from a tape head. Output obtainable from fully modulated tape approximately 100mV. Switched equalisation permits straight line amplification for microphone, etc. Gain with input not exceeding 2,500 ohms 200 times; without equalisation, gain is 2,000 times. Price: £7.80; pair for stereo £15.

#### WAL D-Mag

Pinpoint eraser for striped film, tapes and tape heads. Nylon-cushioned probes. Weight: 9 1/2 oz. Size: 2in sq x 1in wide. Psn 200-250V 50-100Hz. Consumption: 110mA at 240V. Price: £3 (plus 77 1/2 p PT).

#### WAL professional tape eraser

Will erase both sides of a 7in tape reel in 30 secs and sound from 16mm 10in aluminium reels. Weight: 7lb. Size: 6 1/2 x 4 3/4 x 3 3/4 in. Psn 200-250V 50Hz, or 110-125V 60Hz. Finish: oyster hammer grey. Price: £8.92 1/2 (plus £2.35 PT).



## Just add sound

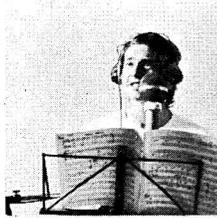
A simple statement, but to the many professional audio engineers using EMITAPE it means flawless recording. EMITAPE provides the qualities of low modulation noise, good dynamic range and signal-to-print ratio so essential in professional sound.

Of course you don't have to be a professional to appreciate EMITAPE quality: it is inherent in all types of EMITAPE in reel and cassette. Try it for your next recording, and hear the difference.

not just any tape **EMITAPE**

EMI Tape Limited · Hayes · Middlesex · England · Telephone: 01-573 3888

**EMI**



**Scotch Magnetic Tape**

**Recording studios use it every day**



*'3M' and 'Scotch' are trademarks*

# Directory of Magnetic Tape

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ AGFA-GEVAERT LTD

Unity House, Great West Road,  
Brentford, Middlesex.

Tel: 01-560 2131 (20 lines). Telex: 28154.

### PE36K ★

Long-play tape supplied in plastic library box. 3in 210ft (in universal mailing box) 46p; 4½in 600ft £1-33; 5in 900ft £1-63; 5½in 1,200ft £2-03; 7in 1,800ft £2-94½.

### PE36

Long-play tape supplied in cardboard box. 8½in 2,400ft £3-66; 10in 2,380ft £4-93; 10½in 4,200ft £6-21.

### PE46K

Double-play tape supplied in plastic library box. 3in 300ft (in universal mailing box) 68p; 4½in 900ft £1-63; 5in 1,200ft £2-01; 5½in 1,800ft £2-93; 7in 2,400ft £3-69½.

### PE46

Double-play tape supplied in cardboard box. 8½in 3,280ft £4-93.

### PE66K

Triple-play tape supplied in plastic library box. 3in 450ft (in universal mailing box) 91p; 4in 900ft £1-63; 4½in 1,200ft £2-01; 5in 1,800ft £2-91; 5½in 2,400ft £3-68; 7in 3,600ft £5-34½.

### Compact Cassettes ★

C60 (2 × 30 mins) 300ft 76½p; C90 (2 × 45 mins) 450ft £1-01½; C120 (2 × 60mins) 600ft £1-51½.

## ■ BASF UNITED KINGDOM LIMITED

Audio/Video Tapes Division, PO Box 473,  
Knightsbridge House, 197 Knightsbridge,  
London, SW7.

Tel: 01-584 5080. Telex: 267574/5.

### SP 52

Standard play. Round pack: 5in 600ft £1-13; 5½in 900ft £1-53; 7in 1,200ft £1-77. In plastic swivel box: 5in 600ft £1-31; 5½in 900ft £1-72; 7in 1,200ft £1-98.

### LP 35

Long-play. Round pack: 3in 210ft 45p; 4in 450ft 95p; 4½in 600ft £1-13; 5in 900ft £1-53; 5½in 1,200ft £1-77; 7in 1,800ft £2-63. In plastic

swivel box: 3in 210ft 57p; 4in 450ft £1-13; 4½in 600ft £1-30; 5in 900ft £1-71; 5½in 1,200ft £1-97; 7in 1,800ft £2-83.

### LP 35 LH

Long-play. Low noise, high output. In plastic swivel box: 5in 900ft £1-89; 5½in 1,200ft £2-17; 7in 1,800ft £3-11.

### DP 26

Double-play. Round pack: 3in 300ft 60p; 4in 600ft £1-13; 4½in 900ft £1-53; 5in 1,200ft £1-77; 5½in 1,800ft £2-63; 7in 2,400 £3-27. In plastic swivel box: 3in 300ft 72p; 4in 600ft £1-30; 4½in 900ft £1-70; 5in 1,200ft £1-96; 5½in 1,800ft £2-82; 7in 2,400ft £3-48.

### DP 26 LH

Double-play. Low noise, high output. In plastic swivel box: 5in 1,200ft £2-16; 5½in 1,800ft £3-10; 7in 2,300ft £3-83.

### TP 18

Triple-play. Round pack: 3in 450ft 95p; 3½in 600ft £1-13; 4in 900ft £1-53; 4½in 1,200ft £1-77; 5in 1,800ft £2-63; 5½in 2,400ft £3-27; 7in 3,600ft £4-13. In plastic swivel box: 3in 450ft £1-09; 3½in 600ft £1-30; 4in 900ft £1-70; 4½in 1,200ft £1-95; 5in 1,800ft £2-81; 5½in 2,400ft £3-47; 7in 3,600ft £4-33.

### TP 18 LH

Triple-play. Low noise, high output. In plastic swivel box: 5in 1,800ft £3-09; 5½in 2,400ft £3-82; 7in 3,600ft £4-75.

### Compact Cassettes

BASF low noise tape in KK 8 swivel box for posting or use stacked as book: C 60 79p; C 90 £1-07; C 120 £1-57. In normal pack: C 60 71p; C 90 99p; C 120 £1-49.

### Special requirement tapes

See details in Tape Accessories Section.

## ■ EMI TAPE LTD

Blyth Road, Hayes, Middlesex.

Tel: 01-573 3888. Telex: 22417.

### 88 Standard Play (red band)

Prestretched polyester base. 3in 175ft 44p; 4in 300ft 60½p; 5in 600ft £1-19; 5½in 900ft £1-58; 7in 1,200ft £1-98½.

### 99 Long Play (green band)

Prestretched polyester base. 3in 210ft 52½p; 4in 450ft 83p; 5in 900ft £1-58; 5½in 1,200ft £1-98; 7in 1,800ft £2-80½.

### 100 Double Play (blue band)

Superflex polyester base. 3in 300ft 80p; 4in 600ft £1-40; 5in 1,200ft £2-34; 5½in 1,800ft £3-09½; 7in 2,400ft £4-32.

### 300 Triple Play (grey band)

Extra tensile polyester base. 3in 450ft £1-23; 4in 900ft £2-12; 5in 1,800ft £3-65½.



Agfa Cassettes



Agfa Cassettes



Agfa Low Noise Tapes

All Emitape is supplied in transparent hinged library case. A prefolded index card is included. Card is designed to provide maximum space for titling with easy visible reference without opening the box.

#### Compact Cassettes

C.60 (one hour playing time) 71p; C.90 (1½ hours playing time) 98½p; C.120 (2 hours playing time) £1-48½.

EMI cassettes are supplied in library case with index sheet.

#### HMV Voice Letter

Supplied in mailing pack. 3in spool. Price: 30p.

#### Plastic Spools

In cartons. 4in 20p; 5in 21p; 5½in 23p; 7in 26p. In self-standing dust-proof plastic library case. 3in-17½p; 4in 28½p; 5in 35p; 5½in 35p; 7in 42p.

#### ■ FERRODYNAMIC INTERNATIONAL

Leda Tapes (Despatch Dept),  
17 Leigh Park Road, Leigh-on-Sea, Essex.

#### Standard Play

Acetate base: 5in 600ft 44p; 7in 1,200ft 67p.

#### Long Play

Acetate base: 5in 900ft 55p; 5½in 1,200ft 67p; 7in 1,800ft 80p; Polyester base: 7in 1,800ft £1-09.

#### Double Play

Polyester base: 5in 1,200ft 80p; 5½in 1,800ft £1-12; 7in 2,400ft £1-25.

#### ■ GRUNDIG (Great Britain) LTD

Newlands Park, London, SE26.  
Tel: 01-778 2211.

#### GT11

Triple-play: 4½in 1,200ft £2-47.

#### GL15 Hi-Fi

Long-play: 5½in 1,200ft £1-97.

#### GD15 Hi-Fi

Double-play: 5½in 1,800ft £2-75.

#### GL18 Hi-Fi

Long-play: 7in 1,800ft £2-80.

#### GD18 Hi-Fi

Double-play: 7in 2,400ft £3-75.

#### C60 Hi-Fi

Compact cassette. 60 minutes playing time at 1¾i/s. Price: 85p.

#### C90 Hi-Fi

Compact cassette. 90 minutes playing time at 1¾i/s. Price: £1-25.

#### DC90

Cassette. 90 minutes playing time. Price: £1-50.

#### DC120

Cassette. 120 minutes playing time. Price: £1-77.  
*Note:* Grundig prices include purchase tax where applicable.

**HITACHI SALES (UK) LTD**

Park House, Coronation Road, Park Royal,  
London, NW107QS.  
Tel: 01-965 9861. Telex: 923268.

**Cassette tapes**

Low noise tape. 60 mins recording. C60 cassette.  
In library case. Price: 87p (including PT).

High density, high sensitivity tape. 90 mins  
recording. C90 cassette. In library case. Price:  
£1.22 (inc. PT).

Nine micron thick tape. 120 mins recording.  
C120 cassette. In library case. Price: £1.62  
(including PT).

**LEDA TAPE**

Leda Tapes, 17 Leigh Park Road, Leigh-on-Sea,  
Essex.

**Standard Play**

PVC base: 3in 150ft 12p; 4in 300ft 21p; 5in  
600ft 44p; 5½in 900ft 52p; 7in 1,200ft 62p.

**Long Play**

PVC base: 3in 225ft 16p; 4in 450ft 27p; 5in  
900ft 51p; 5½in 1,200ft 62p; 7in 1,800ft 89p.

**Double Play**

Polyester base: 3in 300ft 22p; 4in 600ft 42p;  
5in 1,200ft 79p; 5½in 1,800ft 99p; 7in 2,400ft  
£1.12.

**Triple Play**

Polyester base: 3in 600ft 46p; 4in 900ft 66p;  
5in 1,800ft £1.17; 5½in 2,400ft £1.49; 7in 3,600ft  
£1.99.

**MASTERTAPE (MAGNETIC) LTD**

Blackthorne Road, Poyle Trading Estate,  
Colnbrook, Bucks, SL3 0AQ.  
Tel: Colnbrook 2431.

**Standard (red)**

3in 150ft 27p; 4in 300ft 50p; 5in 600ft £1.03;  
5½in 900ft £1.37; 7in 1,200ft £1.67.

**Long Play (yellow)**

3in 225ft 42p; 4in 450ft 62p; 5in 900ft £1.40;  
5½in 1,200ft £1.75; 7in 1,800ft £2.50; 8½in 2,400ft  
£3.62.

**Double Play (blue)**

3in 300ft 62p; 4in 600ft £1.05; 5in 1,200ft £2.10;  
5½in 1,800ft £2.75; 7in 2,400ft £3.87.

**Triple Play (green)**

3in 600ft £1.10; 4in 900ft £1.50; 5in 1,800ft  
£2.87; 5½in 2,400ft £3.97; 7in 3,600ft £5.

**Super Play (orange)**

3in 800ft £1.62; 4in 1,200ft £2.25.

**Mini Voice Letter (Mailing Carton)**

3in 100ft 16p.

**Senda-Message (Mailing Envelope)**

1½in 100ft 15p.

**Compact Cassettes**

C.60 35p; C.90 87p; C.120 £1.38.

**MAXELL**

Distributors: Harris and Russell Ltd,  
124-130 East Road, London, N1.  
Tel: 01-253 7551.

**Compact Cassettes**

Low-noise tape with anti-static arrangement  
and freedom from print-through. C.60 (red  
label) 60 minutes playing time. Price: 50p. C.90  
(blue label) 90 minutes playing time. Price:  
75p. C.120 (green label) 120 minutes playing  
time. Price: £1.

All Maxell compact cassettes are supplied in  
individual library type hinged plastic storage  
cases.

**PHILIPS ELECTRICAL LTD**

Century House, Shaftesbury Avenue,  
London, WC2. Tel: 01-437 7777.  
Cables: Philamps, London.

**Standard Play (Green)**

Coercivity 290 OE, retentivity 950G, tensilised  
polyester base, S/N at 3½i/s better than 50dB,  
print through about 55dB, relative frequency  
response 333Hz-12.5kHz + 1dB. 4in 300ft 75p;  
5in 600ft £1.30; 5½in 900ft £1.71; 7in 1,200ft  
£1.98.

**Long Play (Red)**

Coercivity 290OE, retentivity 950G, tensilised  
polyester base, S/N at 3½i/s better than 50dB,  
print through about 55dB, relative frequency  
response 333Hz-12.5kHz + 1dB. 3in 210ft 55p;  
4in 450ft 95p; 5in 900ft £1.45; 5½in 1,200ft £1.81;  
7in 1,800ft £2.58.

**Double Play (Blue)**

Coercivity 290OE, retentivity 950G, tensilised  
polyester base, S/N at 3½i/s better than 50dB,  
print through about 55dB, relative frequency  
response 333Hz-12.5kHz + 1dB. 3in 300ft 73p;  
4in 600ft £1.30; 5in 1,200ft £1.95; 5½in 1,800ft  
£2.84; 7in 2,400ft £3.98.

**Triple Play (Olive)**

3in 450ft £1.13; 4in 900ft £1.99; 5in 1,800ft  
£3.35.

**Audio Letter**

3in 200ft standard play tape. Price: 38p.

**C.30 postal pack compact cassette**

Playing time 30 minutes. Price: 53p.

**Compact Cassettes**

Polyester base, S/N 50dB, bias adjustment 0dB,  
maximum output level (MOL) at 333Hz 0dB,  
maximum output level (MOL) at 8kHz - 10dB,



Synchrotape



Synchrotape

relative frequency response (RFR) at 10kHz 0dB, relative tape sensitivity (RTS) at 333Hz 0dB (tape speed  $1\frac{1}{2}$ i/s). C.60 (one hour playing time) 71p; C.90 ( $1\frac{1}{2}$  hours playing time) 99p; C.120 (two hours playing time) £1-49.

**EL1907/52 Endless loop cassette CE.10**

Approx playing time: 40 minutes at  $1\frac{1}{8}$ i/s. Approximately 195ft. Price: £3-55.

■ **SCOTCH**

Minnesota Mining and Manufacturing Ltd, 3M House, Wigmore Street, London, W1. Tel: 01-486 5522.

**175**

Standard play; polyester base. 5in 600ft £1-07; 5½in 900ft £1-42; 7in 1,200ft £1-78.

**215**

Long play; polyester base. 3in 300ft 48p; 4in 500ft 74p; 5in 900ft £1-42; 5½in 1,200ft £1-77; 7in 1,800ft £2-53; 8½in 2,400ft £3-67.

**220**

Double play; tensilised polyester base. 3in 400ft 83p; 4in 600ft £1-26; 5in 1,200ft £2-12; 5½in 1,800ft £2-79; 7in 2,400ft £3-90.

**290**

Triple play; tensilised polyester base. 3in 600ft £1-24; 4in 900ft £1-96.

**Scotch Dynarange Specification**

Coercivity 315 oersteds, retentivity 790 gauss, remanence 0-64 lines/quar. in, erasing field required 1,000 oersteds, standard bias 100%, peak bias 117% compared with standard tape. Full technical data on Scotch Dynarange magnetic tape available on sheet 202-203 which includes notes on testing.

**Dynarange 203**

Polyester base. Standard play in library cases. 5in 600ft £1-28; 5½in 900ft £1-72; 7in 1,200ft £2-17.

**Dynarange 203**

Polyester base. Long play in library cases: 5in 900ft £1-69; 5½in 1,200ft £2-13; 7in 1,800ft £3. Long play in cardboard box: 8½in 2,400ft £4-21; 10½in 3,600ft £6-32.

**Dynarange 204**

Double play in cardboard box: 3in 400ft 96p; 4in 600ft £1-47. Double play in library case: 5in 1,200ft £2-39; 5½in 1,800ft £3-16; 7in 2,400ft £4-45.

**Compact cassettes**

C.60 71p; C.90 96p; C.120 £1-49.

**Eight-track cartridges**

40 mins £1-50; 80 mins £1-80.

■ **SYNCHROTAPE**

Sole distributors: Adastra Electronics Ltd, Unit 22, Cricklewood Trading Estate, Claremont Road, London, NW21TU. Tel: 01-452 6288 (answering service 01-452 6289).

Specification of Synchrotape includes the following: Coercivity 270 Oersteds, remanent induction 0-75 maxwell per 6-25mm width. At  $7\frac{1}{2}$ i/s  $\frac{1}{2}$ -track, biased to give max output at 1kHz, with DIN 70µ Sec playback equalisation, main characteristics are: recorded flux for 2% third harmonic distortion 0-2 maxwell, unweighted RMS noise referred to 0-2 maxwell - 65dB, print-through after 72 hours at 20°C - 58dB.

**Standard Play**

PVC base: 3in 150ft 22½p; 5in 600ft 82½p; 5½in 900ft 97½p; 7in 1,200ft £1-27½.

**Long Play ★**

PVC base: 2½in 200ft 30p; 3in 200ft 30p; 4in 450ft 67½p; 5in 900ft 93p; 5½in 1,200ft £1-12½; 7in 1,800ft £1-56.

**Double Play**

Tensilised polyester base: 2½in 300ft 37½p; 3in 300ft 37½p; 4in 600ft 97½p; 5in 1,200ft £1-56; 5½in 1,800ft £1-95; 7in 2,400ft £2-50.

**Triple Play**

Tensilised polyester: 3in 450ft 75p; 4in 900ft £1-20p; 5in 1,800ft £2-10; 5½in 2,400ft £2-77½; 7in 3,600ft £3-75.

Except for 2½in and 3in spools, all Synchronape tapes have leader, trailer and double metallic stop-foils.

#### Syncassettes

Syncassette C.60 (60 minutes playing time) 67½p;  
Syncassette C.90 (90 minutes playing time) 82½p;  
Syncassette C.120 (120 minutes playing time) £1.20.

#### ■ TAPE 70

Leda Tapes, 17 Leigh Park Road, Leigh-on-Sea, Essex.

#### Standard Play

PVC base: 3in 150ft 16p; 4in 300ft 32p; 5in 600ft 57p; 5½in 900ft 72p; 7in 1,200ft 87p.

#### Long Play

PVC base: 3in 225ft 21p; 4in 450ft 37p; 5in 900ft 72p; 5½in 1,200ft 87p; 7in 1,800ft £1.25.

#### Double Play

Polyester base: 3in 300ft 32p; 4in 600ft 60p; 5in 1,200ft £1.12; 5½in 1,800ft £1.47; 7in 2,400ft £1.87.

#### Triple Play

Polyester base: 3in 600ft 65p; 4in 900ft 87p; 5in 1,800ft £1.75; 5½in 2,400ft £2.42; 7in 3,600ft £3.12.

#### ■ TELEFUNKEN

Distributors: A.E.G. (Great Britain) Ltd, AEG House, Chichester Rents, Chancery Lane, London, WC2. Tel: 01-242 9944.

#### Endless Tape Cassette

Price: £3.36 (plus 83p PT).

#### ■ TONEMASTER TAPES

Chart Edge Ltd, 18/21 Jermyn Street, London, SW1. Tel: 01-734 1443.

#### Standard Play

PVC base: 3in 150ft 12p; 4in 300ft 30p; 5in 600ft 35p; 5½in 900ft 45p; 7in 1,200ft 50p.

#### Long Play

PVC base: 3in 225ft 15p; 4in 450ft 33p; 5in 900ft 45p; 5½in 1,200ft 60p; 7in 1,800ft 70p.

#### Double Play

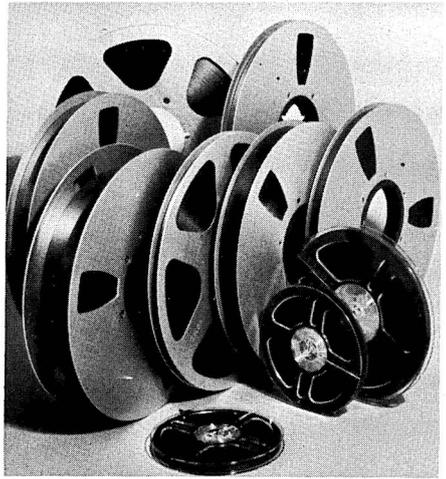
Polyester base: 3in 300ft 27p; 4in 600ft 37p; 5in 1,200ft 67p; 5½in 1,800ft 90p; 7in 2,400ft £1.10.

#### Triple Play

Polyester base: 3in 600ft 48p; 4in 900ft 65p; 5in 1,800ft £1.25; 5½in 2,400ft £1.75; 7in 3,600ft £2.25.

#### Boxed Empty Spools

(Can only be bought with orders for tape). 3in 10p; 4in 15p; 5in 18p; 5½in 20p; 7in 20p.



Zonal Spectrum I

Leaders and stop foils on LP, DP and TP 5in to 7in. Tonemaster tapes are British made and supplied in individual boxes. Postage 15p on orders up to £3; over £3 post free. By-return postal service.

#### ■ ZONAL FILMS

Zonal Films (Magnetic Coatings) Ltd, Holmethorpe Avenue, Redhill, Surrey. Tel: Redhill 67171.

#### Spectrum 1 Low Noise ★

Professional sound recording tape on high quality polyester base. Matt backing for better stacking under fast wind conditions and less base scratching. Not recommended for equipment using pressure pads. Coated with black oxide by special process to reduce static and improve conductivity.

#### Spectrum I Low Print

Professional sound recording tape on high quality acetate, polyester or high-tensile vinyl base. Suitable for equipment using pressure pads.

Both types of Spectrum tape are treated to reduce head and guide wear. Spectrum is available in a comprehensive range of lengths and widths for professional recording purposes. Both tapes show an input/output improvement of 4dB at 2% distortion compared with standard Zonal tapes.

# Directory of Test Tapes and Discs

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ AMPEX GREAT BRITAIN LTD

Acre Road, Reading, Berks.

Tel: Reading 84411.

### 31334-01

Test tape at  $3\frac{3}{4}$ i/s with  $200\mu$  Sec characteristic. 40Hz-8kHz in bands.

### 31331-01

Test tape at  $3\frac{3}{4}$ i/s with  $120\mu$  Sec characteristic. 40Hz-8kHz in bands.

### 31321-01

Test tape at  $7\frac{1}{2}$ i/s to NAB characteristic. 40Hz-10kHz in bands (full-width track).

Prices and full details of the Ampex test tapes available on request.

## ■ A.P.A.E.

Association of Public Address Engineers,  
394 Northolt Road, South Harrow, Middlesex,  
HA28EY. Tel: 01-864 3405/6.

### A.P.A.E. Test Disc

7in 45rpm double-sided mono disc for testing sound systems, particularly public address and sound reinforcement installations.

Side One consists of three minutes of male speech followed by three minutes of female speech. At end of male speech there is a period of 30 seconds of 'off-mic' speech to illustrate correct microphone technique.

Side Two starts with 60 test phrases selected for phonetic balance. The next two bands are 1,000 Hz tone and warble tone, for equipment line-up and measurement with sound level meters. Final two bands are white noise and pink noise. Produced primarily for A.P.A.E. members the record is now available generally. Price: 70p (plus 10p postage).

## ■ BASF (UK) LTD

Knightsbridge House, 197 Knightsbridge,  
London, SW7. Tel: 01-584 5080.

### Calibration Tape 9

$3\frac{3}{4}$ i/s (9cm per second) full-track tape recorded

to  $90\mu$  Sec characteristic. Range: 30Hz-16kHz in bands, also for azimuth alignment.

### Calibration Tape 19H

$7\frac{1}{2}$ i/s (19cm per second) full-track tape recorded to  $50\mu$  Sec characteristic. Range: 30Hz-18kHz in bands, also section for azimuth alignment.

### Calibration Tape 19S

$7\frac{1}{2}$ i/s (19cm per second) full-track tape recorded to  $70\mu$  Sec characteristic. Range: 30Hz-18kHz in bands, also section for azimuth alignment.

### Calibration Tape 38

15i/s (38cm per second) full-track tape recorded to  $35\mu$  Sec characteristic. Range 30Hz-18kHz in bands, also gliding tone from 30Hz-16kHz and section for azimuth alignment.

### Short Calibration Tape 38

15i/s (38cm per second) full-track tape recorded to  $35\mu$  Sec characteristic. Bands of 63Hz, 1kHz, 6.3kHz, 8kHz, and 14kHz, each of 5 seconds duration. Used for routine alignment checks.

### Calibration Tape 4-75

$1\frac{7}{8}$ i/s (4.75cm per second) full-track tape recorded to  $120\mu$  Sec characteristic. Range: 30Hz-10kHz in bands, also section for azimuth alignment.

### Stereo Test Tape 38

15i/s (38cm per second) test tape used in conjunction with Calibration Tape 38 for aligning stereo recorders. Contains: (1) Tone level section of 1kHz for 15 seconds on each channel, (2) Track position section of 1kHz, (3) Azimuth alignment section of noise containing frequencies from 5.6kHz to 16kHz across the full tape width, (4) Cross-talk section of 63Hz for 8 seconds on each channel, 1kHz for 8 seconds on each channel and 10kHz for 8 seconds on each channel.

### Alignment Tape

$3\frac{3}{4}$ i/s (9cm per second) tape used for adjusting replay heads. Noise is recorded to four-track standard, with track 3 erased. Frequencies 5.6kHz to 16kHz. When replayed at  $7\frac{1}{2}$ i/s, frequencies become 11.2kHz to upper limit of recorder, and at  $1\frac{7}{8}$ i/s frequencies become 2.8kHz to 8kHz.

### Azimuth Test Tape

Used for aligning replay heads at tape speeds of  $7\frac{1}{2}$ i/s, 15i/s, and 30i/s. A high frequency is recorded on two 2.75mm edge tracks, and their phase relationship is switched alternately from  $+45^\circ$  —  $-45^\circ$  every second at 15i/s. The replay head is correctly adjusted when there is maximum output without level variations. In stereo both replay channels must be phase-correct.

(Note: Calibration tapes for  $\frac{1}{2}$ in (12.5mm) and 1in (25mm) tape widths are also available, recorded to the standard  $35\mu$  Sec characteristic.)

Prices of calibration and test tapes available on request.

**THE DECCA RECORD CO LTD**

Decca House, 9 Albert Embankment,  
London, SE1. Tel: 01-735 8111.

**How to give yourself a stereo check-out ★**

Stereo SKL-4861. The record is designed to provide a means for the exacting listener to check the performance of his equipment without the need for expensive and complicated instruments. Side One starts with a short explanation of the purpose of the record and there is a detailed account of each band and how the information should be used on the sleeve. Side One: (1) Introduction, (2) left-right channel identification, speaker balance, channel phasing, (3) mono music, (4) tone controls, (5) sound colouration, (6) stereo music, (7) groove-jumping and distortion, (8) silent grooves. Side Two: (1) live versus recorded sound, (2) wow and flutter, (3) anti-skating band, (4) crosstalk, (5) musical show-piece. Price: £2.19.

**45-71123**

Mono 7in 45rpm record providing 50Hz-10kHz in bands. Price: 50p (inc. PT).

**LXT5346**

Mono 12in 33 $\frac{1}{3}$ rpm record providing 30Hz-18kHz in bands. Price: £2.39 (including PT).

**SXL2057**

Stereo 12in 33 $\frac{1}{3}$ rpm record providing 40Hz-12kHz in bands. Price: £2.39 (including PT).

**SKL4861**

Stereo 12in 33 $\frac{1}{3}$ rpm record providing tests for balance, phase, tone, wow, flutter, crosstalk and music bands. Price: £2.19.

**DEUTSCHE GRAMMOPHON**

Deutsche Grammophon (Great Britain) Ltd,  
12-13 Rathbone Place, London, W1.  
Tel: 01-499 8686.

**101497**

Stereo 7in 45rpm record providing tests for balance, phase, music, voice and effects. Price: on application.

**EMI ELECTRONICS LTD**

Installation and Maintenance Division,  
Blyth Road, Hayes, Middlesex.  
Tel: 01-573 3888.

**SRT14A**

Test tape at 3 $\frac{3}{4}$ i/s with 120 $\mu$  Sec characteristic. Full-track recording. Spoken announcement followed by 40Hz-10kHz in bands. Section of 3kHz tone for wow and flutter check, also strobe markings for checking speed.

**SRT15A**

Test tape at 3 $\frac{3}{4}$ i/s with 200 $\mu$  Sec characteristic. Full-track recording. Spoken announcement



*Decca-How to give yourself a stereo check-out*

followed by 40Hz-8kHz in bands. Section of 3kHz tone for wow and flutter check, also strobe markings for checking speed.

**SRT18**

Test tape at 7 $\frac{1}{2}$ i/s with 70 $\mu$  Sec characteristic. Full-track recording. Spoken announcement followed by 30Hz-16kHz in bands. Section of 3kHz tone for checking wow and flutter, also strobe markings for checking speed.

**SRT17**

Test tape at 15i/s with 35 $\mu$  Sec characteristic. Full-track recording. Spoken announcement followed by 30Hz-20kHz in bands. Section of 3kHz tone for wow and flutter check also strobe markings for checking speed.

**TBT.1A**

Test tape at 7 $\frac{1}{2}$ i/s with 100 $\mu$  Sec characteristic for domestic recorders. Full-track recording. 8kHz section for azimuth adjustment, followed by 40Hz-12kHz.

**TBT.2A**

Test tape at 3 $\frac{3}{4}$ i/s with 120 $\mu$  Sec characteristic for domestic recorders. Full-track recording. 6kHz section for azimuth adjustment, followed by 40Hz-8kHz.

Prices and further details of EMI test tapes available on request.

**EMI RECORDS**

Gramophone Co Ltd, EMI House,  
20 Manchester Square, London, W1.  
Tel: 01-486 4488.

**TCS101**

12in stereo record at 33 $\frac{1}{3}$ rpm. 30Hz-20kHz in bands.

★ Indicates entry is illustrated

### TCS102

12in stereo record at 33 $\frac{1}{3}$ rpm. 30Hz-20kHz gliding tone.

### TCS104

12in mono record (lateral) at 33 $\frac{1}{3}$ rpm.

### TCS105

12in mono record (vertical) at 33 $\frac{1}{3}$ rpm.

Prices and further details of EMI test records available on request.

## ■ HI-FI SOUND

Distributors: Howland-West Ltd,  
2 Park End, South Hill Park, London, NW3.  
Tel: 01-794 6666/6033.

### Test record HFS69

Side 1. Test 1, channel recognition, phasing and balance using transient random noise bursts with spoken announcements recorded in free-air conditions; test 2, white noise (monophonic) for subjective evaluation of pickups and speakers and for setting up tape recorder bias and heads; test 3, determination of side-thrust adjustment and minimum tracking weight of pickup by means of lateral and vertical modulations in four different bands; test 4, applause—for identifying greatest possible number of individual sounds; test 5, music.

Side 2. Test 1, reference level and channel separation at 1kHz 5cm/sec 45 degrees; test 2, pink noise producing constant energy per octave; test 3, tone bursts—eight bands of 1kHz tone in bursts on separate channels at 7 or 10 cm/sec; test 4, wow and flutter, lateral cut 5cm/sec 3kHz for use with wow and flutter meters, also concentricity check; test 5, rumble, lateral cut 10cm/sec 1kHz tone followed by unmodulated grooves. Price: £1.50 (including PT).

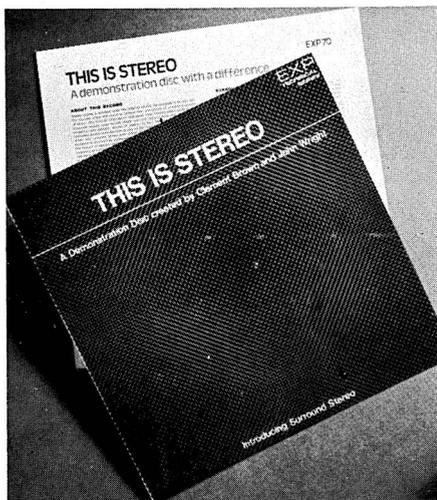
## ■ HOWLAND-WEST LTD

2 Park End, South Hill Park, London NW3.  
Tel: 01-794 6666/6033.

### This is stereo: EXP70 ★

Demonstration record that includes setting up instructions for stereo and four-speaker sound. Record cut by Ron Pinder and George Peckham of Apple Corps, using Telefunken M10 Studio tape machine and Dolby noise-reduction system. Setting-up section includes twin-channel stereo identification and balance, in-phase and balance check and final presentation.

A second band gives a 1kHz signal for control adjustment and a third band produces concert hall audience sounds as a check on adjustment of four-speaker systems. There are unmodulated grooves to check turntable rumble level. Instruc-



*This is Stereo EXP70*

tions are given for correct settings. Musical demonstration pieces are included and these have been composed by Mike Vickers and played by an ensemble comprising flute, French horn, timpani, side-drum, xylophone, cymbals, celeste, guitar, amplified guitar and bass. Price: £1.45 (plus 50p PT).

## ■ POLYDOR RECORDS LTD

17-19 Stratford Place, London, W1.  
Tel: 01-493 7401.

### 220497

7in stereo 45rpm record. Tests for checking and adjusting balance, tone and phasing. Bands of music and effects. Price on request.

## ■ PYE BUSINESS COMMUNICATIONS

Orchard Road, Royston, Herts.  
Tel: Royston 44141.

### LBB9050

7in 45rpm record. Side One: (mono) For the Love of Mike—information on use and installation of microphones. Side Two: (stereo) stereo tests. Price and further details on request.

## ■ SHURE ELECTRONICS LTD

84 Blackfriars Road, London, SE1.  
Tel: 01-928 3424.

### TTR-101 'An audio obstacle course'

Designed to demonstrate the ability of a pickup stylus to remain in contact with groove modulations over a wide range of frequencies and intensities.

The record explores tracking demands by reproducing a number of musical sounds at levels which start very low and progress to highest possible modulation. Each level is 4dB (or 58%) higher than the preceding one. Four steps cover 400%. Side One is designed to test tracking ability at very high and very low frequencies and is recorded in both channels. Side Two has single channel stereo tests for 1kHz level, channel balance, phasing and tracking ability using several instruments.

Side One: band 1—introduction; band 2—orchestral bells; band 3—drum and cymbal; band 4—anti-skating band; band 5—bass drum; band 6—silent grooves.

Side Two: band 1—channel balancing and phasing; band 2—electric organ in left channel only; band 3—piano in left channel only; band 4—accordion in left channel only; band 5—harpsicord in left channel only; band 6—electric organ in right channel only; band 7—piano in right channel only; band 8—accordion in right channel only; band 9—harpsicord in right channel only. Price: £1.50 including packing and postage (special reduced price to purchasers of Shure V-15 Type II cartridge. See leaflet enclosed with cartridge).

## ■ TUTCHINGS ELECTRONICS LTD

14 Rook Hill Road, Friars Cliff, Christchurch, Hants. Tel: Highcliffe 2019.

### Test Tape No. 1

Pure tones 40Hz-10kHz with voice identification of each band. Recorded to IEC 70 plus 3180 microsecond characteristic at  $7\frac{1}{2}$ i/s. Track 2 carries continuous 10kHz tone for azimuth alignment.

This tape is used to measure the playback frequency response of  $\frac{1}{4}$ -track and  $\frac{1}{2}$ -track recorders. 3in spool. Price: £1.50 (plus 5p packing and postage).

### Test Tape No. 2

Pure tones 40Hz-7.5kHz with voice identification of each band. Recorded to NAB 90 plus 3180 microsecond characteristic at  $3\frac{3}{4}$ i/s. Track 2 carries continuous 7.5kHz tone for azimuth alignment.

This tape is used to measure the playback frequency response of  $\frac{1}{4}$ -track and  $\frac{1}{2}$ -track recorders. 3in spool. Price: £1.50 (plus 5p packing and postage).

### Test Tape No. 3

One third octave bands of filtered white noise covering range 40Hz-10kHz with voice identification of each band. Recorded to IEC 70 plus 3180 microsecond characteristic at  $7\frac{1}{2}$ i/s.

This tape is used to measure acoustic responses

of recorders, microphones and loudspeakers. On 3in spool. Price: £1.50 (plus 5p packing and postage).

### Test Tape No. 4

One octave bands of filtered white noise with centred frequencies 100Hz-6.4kHz with voice identification of each band. Recorded to IEC 70 plus 3180 microsecond characteristic at  $7\frac{1}{2}$ i/s. Track 2 carries full range of unfiltered white noise.

This tape is used for reverberation and transmission tests of rooms, studios, etc. It can also be used for subjective testing of room acoustics and listening tests on loudspeakers and enclosures. On 3in spool. Price: £1.50 (plus 5p packing and postage).

### Test Tape No. 5

Azimuth and vertical head alignment tape. Full track white noise with track 3 blank. Allows accurate setting of height and azimuth of  $\frac{1}{4}$ -track heads by ear, using no test equipment at all. On 3in spool. Price: £1.50 (plus 5p packing and postage).

### Test Tape No. 6

Azimuth and vertical head alignment tape. Full track 1.25kHz with track 3 erased and recorded at 7.5kHz. This is a factory or service depot test tape and must be used with oscilloscope or output meter and filters. On 3in spool. Price: £1.50 (plus 5p packing and postage).

Test tapes for any speed and recording characteristics produced to special order.

## Table of Tape Playing Times

Length of Tape (Feet)		3600	2400	1800	1700	1200	900	850
Size of Spool		8½ DP	7 DP 8½ LP	5 TP 7 LP 8½ S	5¾ DP	5 DP 5¾ LP 7 S	4 TP 5 LP	5¾ S
Maximum Playing Times		H M	H M	H M	H M	H M	H M	H M
1 Track	15 i/s	48	32	24	22	16	12	11
	7½ i/s	1 36	1 4	48	47	32	24	22
	3¾ i/s	3 12	2 8	1 36	1 30	1 4	48	45
	1⅞ i/s	6 24	4 16	3 12	3 1	2 8	1 36	1 30
2 Tracks	15 i/s	1 36	1 4	48	45	32	24	22
	7½ i/s	3 12	2 8	1 36	1 30	1 4	48	45
	3¾ i/s	6 24	4 16	3 12	3 1	2 8	1 36	1 30
	1⅞ i/s	12 48	8 32	6 24	6 2	4 16	3 12	3 1
4 Tracks	15 i/s	3 12	2 8	1 36	1 30	1 4	48	45
	7½ i/s	6 24	4 16	3 12	3 1	2 8	1 36	1 30
	3¾ i/s	12 48	8 32	6 24	6 2	4 16	3 12	3 1
	1⅞ i/s	25 36	17 4	12 48	12 5	8 32	6 24	6 2

Length of Tape (Feet)		600	450	400	300	200	150
Size of Spool		4 DP 5S	3 TP 4 LP	3½ LP	3¼ LP 4 S	3½ S	3 S
Maximum Playing Time		H M	H M	H M	H M	H M	H M
1 Track	15 i/s	8	6	5	4	2½	2
	7½ i/s	16	12	10	8	5	4
	3¾ i/s	32	25	21	16	10	8
	1⅞ i/s	1 4	48	42	32	21	16
2 Tracks	15 i/s	16	12	10	8	5	4
	7½ i/s	32	24	21	16	10	8
	3¾ i/s	1 4	48	42	32	21	16
	1⅞ i/s	2 8	1 36	1 25	1 4	42	32
4 Tracks	15 i/s	32	24	21	16	10	8
	7½ i/s	1 4	48	42	32	21	16
	3¾ i/s	2 8	1 36	1 25	1 4	42	32
	1⅞ i/s	4 16	3 12	2 50	2 8	1 25	1 4

**Note:** The 4 tape thicknesses are listed as S (Standard), LP (Long Play), DP (Double Play) and TP (Triple Play).

# Manufacturers' revised prices

## (September 1971)

Shortly after the directory sections of this edition of the Hi-Fi Year Book closed for press two important changes in purchase tax were announced.

The first alteration had the effect of applying PT to certain loudspeaker systems which hitherto had been free of tax. The second change reduced the level of PT on all goods subject to tax from 36½ per cent to 30 per cent. The directory sections affected by these tax changes are; pickups and arms, pickup accessories, motor units, radio tuners, tuner/amplifiers, tape recorders, tape decks, tape units, tape amplifiers, tape accessories, some constructional kits, speaker drive units, speaker enclosures, cabinets and complete audio systems.

To provide readers with the most up-to-date information possible this special stop-press section has been introduced and manufacturers were invited to submit revised prices. In some instances makers or distributors were unable to finalise their new prices in time for inclusion.

For guidance it should be noted that the tax figures shown in the main directory sections are now reduced by 18 per cent (approximately one fifth). Prices shown inclusive of tax in these sections are now reduced by approximately 4 per cent (4p in the £).

### ■ ACOS

	List £	Tax £	Total £
GP91-ISC/SS	—	—	1-62
GP91-ISC/DS	—	—	2-13
GP92-ISC/SS	—	—	1-78
GP92-ISC/DS	—	—	2-40
GP93-S/S	—	—	2-40
GP93-D/S	—	—	2-95
GP94-S/S	—	—	2-68
GP94-D/S	—	—	3-25
104-S/S	—	—	3-72
104-D/S	—	—	4-35
104-D/D	—	—	4-70
104-Transcription	—	—	4-30
Stethoset	—	—	1-38
RE6	—	—	00-60

### ■ ACOUSTIC RESEARCH

AR-X/A turntable	61-08	13-40	74-48
AR turntable/amplifier	300-27	65-88	366-15
Wood cover (walnut)	14-76	3-24	18-00
AR-3a (teak)	178-00	—	178-00
AR-3a (walnut)	170-00	—	170-00
AR-3a (pine)	153-00	—	153-00
AR-2ax (teak)	82-00	16-80	98-80
AR-2ax (walnut)	75-70	15-50	91-20
AR-2ax (pine)	63-00	13-25	76-25
AR-6 (teak)	57-10	11-15	68-25

	List £	Tax £	Total £
AR-6 (pine)	47-08	9-17	56-25
AR-4x (teak)	37-64	7-36	45-00
AR-4x (walnut)	37-64	7-36	45-00
AR-4x (pine)	32-59	6-36	38-95

### ■ ADASTRA ELECTRONICS

Imp Verta	3-50	—	3-50
Top 20	7-00	—	7-00
Hi Ten	—	—	3-50
Sonata (pair)	7-50	00-42	7-92
La-Scala (each)	7-50	00-38	7-88

### ■ AKAI

AA6600	114-00	23-34	137-34
AA6200	76-00	15-56	91-56
AA6300	103-05	21-10	124-15
AA8500	184-15	37-70	221-85
X-1800SD	127-00	26-00	153-00
X-V	150-00	30-71	180-71
M.10L	196-00	40-13	236-13
4000	99-90	25-00	124-90

### X-5000 (L and W)

	DISCONTINUED		
CR80	92-00	18-83	110-83
CSS0	104-65	21-43	126-08
1720L	69-50	14-23	83-73
GX 365	305-55	62-56	368-11
X2000SD	239-95	49-13	289-08
4000D	74-66	15-29	89-95
CR80D	76-00	15-56	91-56
CSS0D	88-75	18-17	106-92
X200D	121-15	24-80	145-95

SW130 (each)	37-70	—	37-70
SW155 (each)	58-48	—	58-48
SW180	DISCONTINUED		
CSS-8 (pair)	19-20	3-93	23-13

### ■ RICHARD ALLAN RADIO LTD

Twin Assembly	8-95	1-65	10-60
Triple Assembly	20-35	—	20-35
Super Assembly	24-00	—	24-00
460 TC	1-50	00-28	1-78
CB8	4-00	00-74	4-74
CB8T	4-15	00-77	4-92
CB4 Tweeter	1-95	00-36	2-31
CC8	4-00	00-74	4-74
CF8	5-75	1-06	6-81
CG8T	6-00	1-11	7-11
CG8	5-75	1-06	6-81
CG10	8-50	1-57	10-07
CG10T	9-00	1-66	10-66
CG12	10-00	—	10-00
CG12T	10-25	—	10-25
CG12 Super	13-00	—	13-00
CG15	21-50	—	21-50
CM8	4-00	00-74	4-74
CP8	3-30	00-61	3-91
CR5	5-00	00-92	5-92

# MANUFACTURERS' REVISED PRICES

	List £	Tax£	Total£		List £	Tax£	Total£
<b>Minette</b>	14.25	2.64	16.89	<b>ADC 220X</b>	5.50	1.04	6.54
<b>Chaconne</b>	17.25	3.19	20.44	<b>ADC 990XE</b>	11.95	2.27	14.22
<b>Flamenco</b>	25.00	4.63	29.63				
<b>Pavane</b>	35.25	—	35.25	<b>■ AUDIO SERVICES LTD</b>			
<b>Super Sarabande</b>	61.00	—	61.00	<b>Dynasonic 2T</b>	33.00	—	33.00
<b>High Fidelity Module</b>	9.35	1.73	11.08	<b>Shackman. Dynasonic Monitor</b>	62.00	—	62.00
<b>■ ALPHA</b>				<b>Shackman. Dynastatic AS3</b>	79.00	—	79.00
<b>R 150</b>	49.47	9.53	59.00	<b>Shackman. Dynastatic AS100</b>	140.00	—	140.00
<b>R 200</b>	57.85	11.14	69.00				
<b>R 500</b>	66.24	12.76	79.00	<b>■ AUDIO TECHNICA</b>			
<b>HT 7 Mk II</b>	18.87	3.63	22.50	<b>AT 21</b>	9.50	1.78	11.28
<b>HT 10 Mk II</b>	20.12	3.88	24.00	<b>AT-66</b>	5.45	1.02	6.47
<b>HT 16</b>	10.48	2.02	12.50	<b>AT-1005 Mk II</b>	16.25	3.03	19.28
<b>HT 17 Mk II</b>	13.00	2.50	15.50	<b>AT-21 (elliptical)</b>	14.71	2.76	17.47
<b>HT 20 Mk II</b>	24.74	4.76	29.50				
<b>Combination Unit MR15</b>	124.94	24.06	149.00	<b>■ AVERINE ELECTRONICS</b>			
<b>■ ALTEC LANSING</b>				<b>STA60</b>	WITHDRAWN		
<b>604E</b>	120.00	—	120.00	<b>L60</b>	45.00	—	45.00
<b>1205AX</b>	295.00	—	295.00	<b>STTA60</b>	WITHDRAWN		
<b>1203</b>	243.00	—	243.00				
<b>■ AMSTRAD</b>				<b>■ BAKER REPRODUCERS LTD</b>			
<b>Apollo 138 (Pair)</b>	24.00	—	24.00	<b>Regent</b>	7.00	—	7.00
<b>■ APAE</b>				<b>Major</b>	9.00	—	9.00
<b>Test Disc</b>	—	—	00.70	<b>Deluxe Mk II</b>	10.00	—	10.00
			(plus 00.12 post and packing)	<b>Superb Twelve</b>	15.00	—	15.00
<b>■ A/R/D</b>				<b>Auditorium 12</b>	14.00	—	14.00
<b>2000 Amplifier</b>	49.00	—	49.00	<b>Auditorium 15</b>	19.00	—	19.00
<b>2000 Amplifier Teak</b>	52.50	—	52.50	<b>Laboratory Standard 12</b>	22.00	—	22.00
<b>2000 Player Cabiner</b>	13.00	2.60	15.60	<b>Laboratory Standard 15</b>	28.00	—	28.00
<b>2000 Player fitted Garrard SP 25</b>	25.21	5.14	30.35	<b>Group 25</b>	7.00	—	7.00
<b>2000 VHF Tuner</b>	45.00	9.00	54.00	<b>Group 35</b>	9.00	—	9.00
<b>2000 VHF Tuner Teak</b>	47.40	9.48	56.88	<b>Group 50</b>	19.00	—	19.00
<b>■ ARMSTRONG AUDIO</b>				<b>■ BANG &amp; OLUFSEN U.K. LTD</b>			
<b>523</b>	43.00	8.81	51.81	<b>Beomaster 1000 Teak</b>	64.10	12.80	76.90
<b>524</b>	33.50	6.86	40.36	<b>Beomaster 1000 Rosewood</b>	64.94	12.96	77.90
<b>M8</b>	9.50	—	9.50	<b>Beomaster 1200 Teak &amp; White</b>	82.94	16.56	99.50
<b>525</b>	73.50	15.05	88.55	<b>Beomaster 1200 Rosewood</b>	83.77	16.73	100.50
<b>526</b>	83.75	17.15	100.90	<b>Beomaster 1600M Teak</b>	99.61	19.89	119.50
<b>■ ASTEC</b>				<b>Beomaster 1600M Rosewood</b>	100.44	20.06	120.50
<b>Sound Motor</b>	15.75	—	15.75	<b>Beomaster 3000 Teak</b>	115.28	23.22	139.50
<b>System 10</b>	29.50	—	29.50	<b>Beomaster 3000 Rosewood</b>	117.11	23.39	140.50
<b>System 15</b>	38.75	—	38.75	<b>Beocord 1600 Rosewood</b>	108.78	21.72	130.50
<b>■ AUDIO DEVELOPMENTS</b>				<b>Beocord 1600 Teak</b>	107.95	21.55	129.50
<b>AD76K</b>	3.96	00.39	4.35	<b>Beocord 1800 Teak</b>	132.96	26.54	159.50
<b>AD309K</b>	8.56	1.00	9.56	<b>Beocord 1800 Rosewood</b>	133.79	26.71	160.50
<b>■ AUDIO DYNAMICS CORPORATION</b>				<b>Beocord 1200 Teak or White</b>	82.94	16.56	99.50
<b>ADC 25</b>	69.95	13.29	83.24	<b>Beocord 1200 Rosewood</b>	83.77	16.73	100.50
<b>ADC 26</b>	49.95	9.49	59.44	<b>Beogram 1000LM Teak</b>	33.26	6.64	39.90
<b>ADC 27</b>	39.95	7.59	47.54	<b>Beogram 1000LM Rosewood</b>	34.09	6.81	40.90
<b>ADC 10E</b>	29.95	5.69	35.64	<b>Beomaster 5000 Teak</b>	82.94	15.56	99.50
<b>ADC 660XE</b>	13.95	2.65	16.60	<b>Beomaster 5000 Rosewood</b>	83.77	16.73	100.50
<b>ADC 550XE</b>	14.95	2.84	17.79	<b>Beogram 1200 Teak</b>	47.43	9.47	56.90
<b>ADC 220XE</b>	8.95	1.70	10.65	<b>Beogram 1200 Rosewood</b>	48.26	9.64	57.90

MANUFACTURERS' REVISED PRICES

	List £	Tax£	Total£		List £	Tax£	Total£
Beogram 1200 White	47.43	9.47	56.90	Mk 6.M	124.00	25.39	149.39
Beovox 1700 Teak (pair)	39.72	8.18	47.90	ST200	116.00	23.75	139.75
Beovox 1700 Rosewood (pair)	41.37	8.53	49.90	Mark 5 Series 3 (deck less heads)	45.10	9.23	54.33
Beovox 1800 Teak (pair)	43.87	9.03	52.90	Mark 510 Series 3 (deck less heads)	59.10	12.10	71.20
Beovox 1800 Rosewood (pair)	45.52	9.38	54.90	Mark 6 (deck less heads)	47.85	9.80	57.65
Beovox 2700 Teak (pair)	52.99	10.91	63.90	Mark 610 (deck less heads)	61.85	12.66	74.51
Beovox 2700 White (pair)	52.99	10.91	63.90	Mark 6 Stereo Unit	152.65	31.25	183.90
Beovox 2700 Rosewood (pair)	54.64	11.26	65.90	STB2 Monitoring Amplifier	30.00	6.14	36.14
Beovox 3700 Teak (pair)	65.43	13.47	78.90	Mk 5. Series 3 Record/Playback Amplifier (Eye)	33.50	6.86	40.36
Beovox 3700 Rosewood (pair)	68.73	14.17	82.90	Record/Playback Amplifier (Meter)	37.65	7.71	45.36
Beovox 4700 Teak (pair)	82.52	16.98	99.50	Mixer Unit	3.90	-	3.90
Beovox 4700 Rosewood (pair)	85.82	17.68	103.50	Hi-Fi Tape Unit	73.00	14.95	87.95
Beovox 5700 Teak (pair)	123.98	25.52	149.50	■ BRIMHAM			
Beovox 5700 Rosewood (pair)	127.28	26.22	153.50	Linnet 71	11.60	2.32	13.92
Beovox 2500	44.70	9.20	53.90	Firecrest 71	21.20	4.23	25.43
Beosystem 1000 Teak	141.63	28.27	169.90	Swift 71	23.60	4.71	28.31
Beosystem 1000 Rosewood	144.95	28.95	173.90	Swallow 71	28.00	5.59	33.59
Beosystem 1500 Teak	99.95	19.95	119.90	Kestrel 71	WITHDRAWN		
Beosystem 1500 Rosewood	102.44	20.46	122.90	Oriole 71	59.50	-	59.50
■ BELL & HOWELL				Heron 71	WITHDRAWN		
Design 3600	60.55	11.80	72.35	■ BSR McDONALD			
Design 1700	86.00	16.75	102.75	HT70	17.72	3.50	21.22
■ BIB				MP60	12.69	2.51	15.20
Stylus and Turntable Cleaning Kit	00.27½	00.05½	00.33	610	16.10	3.18	19.28
Record Sleeve Protectors	00.12½	-	00.12½	510	13.68	2.70	16.38
Groov-Keen Model 42	1.66	00.33	1.99	HT70 (on plinth)	25.62	5.06	30.68
Tape Head Cleaning Kit	00.41	00.08	00.49	MP60 (plastic plinth)	18.56	3.67	22.23
Recording Tape Splicer Model 21	9.00	-	9.00	MP60 (wood plinth)	20.58	4.06	24.64
Cassette Tape Editing Kit	1.50	-	1.50	610 (on plinth)	23.99	4.74	28.73
Tape Editing Kit	1.36	-	1.36	510 (on plinth)	21.57	4.26	25.83
Precision Tape Cutters	00.17	00.03	00.20	■ BUSH-ARENA			
Tape Reel Labels	00.10	-	00.10	System 2	-	-	140.34
Anti-Static Cleaner	00.22½	-	00.22½	System 3	-	-	189.29
Cassette Head Cleaning Tape	00.43	00.08	00.51	System 4	-	-	189.29
Splicing Tape	00.23	-	00.23	System 5	-	-	196.04
Cassette Recorder Care Kit	1.90	00.08	1.98	S10 stand	-	-	14.77
Cassette Salvage Kit	00.44	-	00.44	S20 stand	-	-	7.23
Cassette Tray	00.38	00.11	00.49	L530 speakers (pair)	-	-	93.77
Luxury Cassette Case	1.15	00.34½	1.49½	L510 speakers (pair)	-	-	40.87
■ BOSE CORPORATION				L520 speakers (pair)	-	-	55.30
501 (each)	65.00	18.00	83.00	■ B & W ELECTRONICS			
901 (pair)	250.00	52.00	302.00	DM3	63.00	-	63.00
■ BRENNEL ENGINEERING CO LTD				DM1	32.00	6.47	38.47
Mk 5. Type M. Series 3	116.45	23.85	140.30	DM70	159.50	-	159.50
Mk 5. Series 3	93.40	19.12	112.52	■ CAMBRIDGE AUDIO			
STB2	165.00	33.78	198.78	R.50	98.00	-	98.00
ST400	116.00	23.75	139.75	R.40	65.00	-	65.00

# MANUFACTURERS' REVISED PRICES

	List £	Tax£	Total£		List £	Tax£	Total£
<b>■ CELESTON</b>				<b>ffss Mk 4 Cartridge HRC</b> 13.84 2.66 16.50			
Studio 12 Bass	14.40	—	14.40	<b>ffss Mono 78</b>	8.51	1.64	10.15
HF1300 Mk 2	7.14	—	7.14	<b>ffss Mk 4 Cartridge 78C</b>	8.51	1.64	10.15
Xover CO3K	4.47	—	4.47	<b>ffss 'International' Arm</b>	21.38	4.12	25.50
PS8TC 15Ω	2.35	00.45	2.80	<b>Magnetic bias</b>			
PS12TC 8Ω	10.00	—	10.00	<b>Compensation</b>	1.01	00.19	1.20
PS12TC 15Ω	10.00	—	10.00	<b>Centre Locator</b>	00.25	00.05	00.30
Ditton 10 Mk II	20.40	4.12	24.52	<b>Decca Microlift</b>	1.43	00.27	1.70
Ditton 15	00.32	6.47	38.47	<b>Decca lift</b>	6.88	1.32	8.20
Ditton 25	00.65	—	65.00	<b>Studio Turntable</b>			
Ditton 1/20	00.24	4.85	28.85	DK30 Ribbon	15.00	—	15.00
Ditton 44	00.54	—	54.00	D1/8 Bass Unit	14.00	—	14.00
<b>■ CHILTON</b>				<b>Deram Enclosure Teak</b>			
100S/CW	122.00	24.64	146.64	Apollo	20.00	—	20.00
100S/CAW	132.00	26.66	158.66	<b>APOLLO</b>			
100S/CAP	140.00	28.28	168.28	<b>■ DUAL ELECTRONICS</b>			
<b>■ CINECORDER</b>				1214 (less Cart) 28.23 5.43 33.66			
Model A	61.95	12.10	74.05	1215 (less Cart) 31.17 6.00 37.17			
<b>■ CITY AUDIO SERVICES LTD</b>				1218 (less Cart) 43.53 8.38 51.91			
CA/11	15.75	—	15.75	1219 (less Cart) 53.25 10.25 63.50			
CA/12	18.38	—	18.38	CR50	TO BE ANNOUNCED		
CA/20	19.50	—	19.50	CTG29	107.10	20.62	127.72
<b>■ CLENDISC</b>				CL170			
Cleaner	00.22½	—	00.22½	TO BE ANNOUNCED			
Cleaning Pad	00.14	00.02½	00.16½	<b>KA50 Music Centre</b>			
<b>■ CONNOISSEUR</b>				TO BE ANNOUNCED			
SCU1	5.00	00.96	5.96	<b>■ DUETTE</b>			
SAU2	12.00	2.31	14.31	SAT 260 X	60.70	12.46	73.16
Stylus Balance	00.90	00.17	1.07	SAT 460 X	79.72	16.33	96.05
BD1 Kit	10.75	2.07	12.82	SAT 4370 X	39.95	8.18	48.13
BD1 Chassis	13.40	2.48	15.88	ARS 710	8.76	1.80	10.56
BD1/SAU2 Assembly on plinth C/W Cover	32.90	6.33	39.23	ARS 815	12.97	2.67	15.64
BD2 Chassis	25.35	4.88	30.23	ARS 740	22.97	4.71	27.68
BD2 Assembly on plinth C/W Cover	32.40	6.24	38.64	SAT.555.T	49.44	10.14	59.58
<b>■ CONTRONICS (CAROL CINESOUND)</b>				<b>■ DYNACO</b>			
Model R1	9.00	2.56	11.56	Dynaco A50	60.00	11.97	71.97
Model CS/2	34.50	9.83	44.33	Dynaco A.25	32.00	6.38	38.38
Model CS/2 Mk II	38.70	11.03	49.73	<b>■ DYNATRON RADIO LTD</b>			
Model P.2.	22.80	6.50	29.30	P100 Teak	47.80	9.20	57.00
Model SU/1	9.00	2.56	11.56	STA 90	133.75	25.75	159.50
Model TT/1	9.00	1.71	10.71	TRV 26	71.28	13.72	85.00
<b>■ THE DECCA RECORD CO LTD</b>				LS 1034 14.51 2.79 17.30			
SKL4861	1.616	00.474	2.09	LS 1434 16.52 3.18 19.70			
45-71123	0.370	00.105	00.47½	LS 1638 25.00 4.80 29.80			
LXT5346	1.757	00.513	2.27	LS 1734 16.52 3.18 19.70			
SXL2057	1.757	00.513	2.27	LS 2034 21.51 4.14 25.65			
<b>■ DECCA SPECIAL PRODUCTS</b>				LS 3034 27.50 5.30 32.80			
ffss Mk II Head	12.96	2.49	15.45	LS 2504 32.00 — 32.00			
ffss Mk 4 Cartridge C4E	18.24	3.51	21.75	LS 2804 32.00 — 32.00			
ffss Mk 4 Cartridge SC4E	28.34	5.46	33.80	RSU 1 23.08 1.67 24.75			
				RSU 3 36.61 2.64 39.25			
				RSU 2 29.15 2.10 31.25			
				Cavalcade MFC31A 88.47 17.03 105.50			
				Cavalcade MFC 32 111.95 21.55 133.50			
				HFC 91 174.42 33.58 208.00			
				HFC 31 MT 91.41 17.59 109.00			
				SA 90 69.00 — 69.00			

**MANUFACTURERS' REVISED PRICES**

	<i>List £</i>	<i>Tax£</i>	<i>Total£</i>		<i>List £</i>	<i>Tax£</i>	<i>Total£</i>
<b>■ EAGLE INTERNATIONAL</b>				<b>■ FARNELL LTD</b>			
PRE 402	4.95	—	4.95	F.2100	37.50	7.22	44.72
AFT 60	43.00	8.95	51.95	<b>■ FERGUSON</b>			
TST 152	31.00	6.21	37.21	3248	45.07	8.68	53.75
SMC10	32.85	6.63	39.48	3252	88.44	12.26	100.70
SMC20	52.12	10.54	62.66	3258	60.71	11.69	72.40
SMC60	76.09	15.31	91.40	<b>■ FERROGRAH</b>			
TD79	1.50	0.29	1.79	713	165.00	34.65	199.65
T.635	0.88	0.18	1.06	713H	173.00	36.33	209.33
DL.42	9.53	1.96	11.49	722	212.00	44.52	256.52
DL.67	15.80	3.35	19.15	722H	220.00	46.20	266.20
DL.50	19.60	3.92	23.52	702H	190.00	39.90	229.90
LC 05	4.09	0.81	4.90	724	212.00	44.52	256.52
LC 07	5.69	1.14	6.83	704/2	182.00	38.22	220.22
MP 12	24.50	—	24.50	Matching Transformers	4.50	—	4.50
KT 3	10.50	2.12	12.62	Defluxer	3.98	0.84	4.82
CT5	1.10	—	1.10	Dust Cover	5.00	1.05	6.05
CT10	1.80	—	1.80	Plugs	0.34	—	0.34
FR4	3.29	0.66	3.95	Carrying Case	6.00	1.26	7.26
FR65	5.13	1.04	6.17	<b>■ FIDELITY RADIO LTD</b>			
FR8	6.11	1.22	7.33	Unit Audio One	86.39	16.61	103.00
HT15	3.15	—	3.15	<b>■ J. J. FRANCIS</b>			
HT21	3.50	—	3.50	Countdown Speaker	—	—	12.00
DT33	4.50	—	4.50	Countdown System	—	—	71.40
<b>■ EKCO</b>				<b>■ GARRARD ENGINEERING LTD</b>			
Sound Project ZU5	133.57	25.71	159.28	ZERO 100	46.87	9.38	56.25
Sound Project ZU6	60.71	11.69	72.40	ZERO 100S	43.12	8.63	51.75
SRG609	71.65	13.79	85.44	401	31.88	6.38	38.26
<b>■ ELAC</b>				SP25 Mk III	13.21	2.64	15.85
8N/148 Mk II	3.95	0.77	4.72	WB1	3.09	0.62	3.71
E6-S	8.90	1.73	10.63	SPC1	3.00	0.60	3.60
<b>■ ELIZABETHAN</b>				SL95B	40.19	8.04	48.23
Windermere Suite	55.86	10.75	66.61	WB4 Mk II	4.57	0.91	5.48
<b>■ EMPIRE SCIENTIFIC (USA)</b>				SPC4 Mk II	3.56	0.71	4.27
90EE/X	8.00	1.56	9.56	AP76	23.21	4.64	27.75
909/X	7.75	1.51	9.26	WB4 Mk II	4.57	0.91	5.48
909E/X	10.35	2.01	12.36	SPC4 Mk II	3.56	0.71	4.27
999/X	10.50	2.05	12.55	SL72B	26.61	5.32	31.93
999E/X	13.30	2.59	15.89	WB4 Mk II	4.57	0.91	5.48
999SE/X	17.00	3.31	20.31	SPC4 Mk II	3.56	0.71	4.27
999TE/X	21.00	4.00	25.00	<b>■ GEC</b>			
999VE/X	36.00	7.01	43.01	2805	64.19	12.31	76.50
1000ZE/X	50.50	9.84	60.34	2805 (white)	65.88	12.62	78.50
<b>■ EUPHONICS</b>				2807	101.02	19.48	120.50
Miniconic PS 15F	9.45	—	9.45	<b>■ GOLDING AUDIO LTD</b>			
<b>■ FALCON</b>				ST 856	45.00	8.77	53.77
JS-TR2	72.60	13.43	86.03	HW 800 System 8	70.00	14.62	84.62
<b>■ FANTAVOX</b>				<b>■ GOLDRING MANUFACTURING CO</b>			
SR-542	—	—	32.00	L75	11.70	2.28	13.98
SR-544	—	—	37.50	L69	8.40	1.64	10.04
SR-640	—	—	44.00	CS90	4.20	0.82	5.02
				CS91E	6.30	1.23	7.53
				800	10.50	2.05	12.55

# MANUFACTURERS' REVISED PRICES

	List £	Tax £	Total £		List £	Tax £	Total £
<b>G800E</b>	15.20	2.96	18.16	<b>System 731</b>	110.23	21.22	131.45
<b>G800E Super E</b>	21.00	4.10	25.10	<b>System 741</b>	WITHDRAWN		
<b>G800/H</b>	8.60	1.68	10.28	<b>Troika 4012</b>	95.85	18.45	114.30
<b>850</b>	5.25	1.02	6.27	<b>System 4022</b>	WITHDRAWN		
<b>Lenco STB.2</b>	00.81	00.16	00.97	<b>■ HACKER RADIO LTD</b>			
<b>Lencoclean</b>	2.70	00.53	3.23	<b>LS 500 B</b>	18.03	3.47	21.50
<b>Lencoclean (refill)</b>	1.05	—	1.05	<b>LS 1000 C</b>	—	—	27.00
<b>Lenco VV7</b>	9.00	1.76	10.76	<b>LS 1500 A</b>	—	—	44.00
<b>Lenco GL75</b>	33.60	6.55	40.15	<b>GAN 500 Centurion</b>	60.80	11.70	72.50
<b>G99</b>	22.50	4.39	26.89	<b>GAR 500 Centurion</b>	76.94	14.81	91.75
<b>Lenco GL69</b>	23.10	4.50	27.60	<b>GAR 1000 A Tribune</b>	153.04	29.46	182.50
<b>■ GOODMANS LOUDSPEAKERS LTD</b>				<b>GAR 1000 A/SRD Tribune</b>	161.43	31.07	192.50
<b>Stereomax</b>	65.94	14.13	80.07	<b>■ G.F.C. HADCOCK</b>			
<b>Module 80</b>	76.19	15.40	91.59	<b>GH Unipose</b>	13.60	2.62	16.22
<b>Axiette 8</b>	6.50	1.31	7.81	<b>GH Uni-Lift</b>	2.35	0.45	2.80
<b>Twin Axiette 8</b>	7.35	1.49	8.84	<b>■ HALCYON</b>			
<b>Axiom 10</b>	7.70	1.56	9.26	<b>Stereoplan 260</b>	71.43	13.57	85.00
<b>Twin Axiom 10</b>	8.20	1.66	9.86	<b>■ HAMPSTEAD HIGH FIDELITY</b>			
<b>Axiom 201</b>	14.45	—	14.45	<b>Hampstead</b>	—	—	61.00
<b>Axiom 301</b>	20.70	—	20.70	<b>Heath</b>	—	—	49.00
<b>Trebax 100</b>	8.60	—	8.60	<b>■ HEATHKIT</b>			
<b>Midax 650</b>	12.95	—	12.95	<b>TFM-IS</b>	21.26	0.74	22.00
<b>Audiom 51 Bass</b>	13.05	—	13.05	<b>AFM-2</b>	33.27	1.73	35.00
<b>Audiom 61 Bass</b>	18.95	—	18.95	<b>AJ-14</b>	23.26	0.74	24.00
<b>Audiom 81 Bass</b>	31.90	—	31.90	<b>AR-27</b>	24.26	0.74	25.00
<b>Audiom 18P</b>	34.00	—	34.00	<b>AR-29</b>	138.71	33.29	172.00
<b>Audiom 8P</b>	4.45	00.90	5.35	<b>AA-29</b>	70.00	—	70.00
<b>Audiom 10P</b>	4.85	00.98	5.83	<b>AJ-29</b>	86.29	20.71	107.00
<b>Audiom 12P</b>	12.37	—	12.37	<b>AR-19</b>	98.35	1.65	100.00
<b>Audiom 15P</b>	20.00	—	20.00	<b>TSA-12</b>	29.00	—	29.00
<b>Double Maxim</b>	TO BE ANNOUNCED			<b>AA-15</b>	84.00	—	84.00
<b>Havant</b>	TO BE ANNOUNCED			<b>AR-14</b>	52.26	0.74	53.00
<b>Mezzo 3</b>	34.00	—	34.00	<b>AR-17</b>	35.76	0.74	36.50
<b>Magnum K2</b>	44.00	—	44.00	<b>AA-14</b>	30.00	—	30.00
<b>Magister</b>	62.50	—	62.50	<b>AD-27</b>	80.06	5.94	86.00
<b>Minister</b>	20.05	4.05	24.10	<b>AJ-15</b>	88.92	26.08	115.00
<b>Dimension 8</b>	TO BE ANNOUNCED			<b>AA-22U</b>	39.00	—	39.00
<b>■ GRAMPIAN REPRODUCERS</b>				<b>Trent</b>	15.35	1.45	16.80
<b>FM Tuner 571</b>	25.40	5.13	30.53	<b>Berkeley</b>	23.90	—	23.90
<b>■ GRUNDIG</b>				<b>Avon</b>	13.64	1.16	14.80
<b>MV3</b>	5.77	—	5.77	<b>Ambassador</b>	33.00	—	33.00
<b>RT100</b>	142.06	27.34	169.40	<b>AD 17</b>	55.31	4.59	59.90
<b>RTV400</b>	136.73	26.32	163.05	<b>AR 2000</b>	88.25	1.65	89.90
<b>RTV650</b>	189.77	36.53	226.30	<b>■ HECO</b>			
<b>TK121</b>	46.00	9.30	55.30	<b>Heco HA 50</b>	80.00	—	80.00
<b>TK141</b>	51.20	10.35	61.55	<b>SM20</b>			
<b>TK146</b>	55.95	11.30	67.25	WITHDRAWN			
<b>TK246</b>	103.94	21.01	124.95	<b>SM25</b>	18.50	5.25	23.75
<b>TK248</b>	127.19	25.71	152.90	<b>SM35</b>	36.00	6.25	42.25
<b>TK3200 Hi-Fi</b>	122.86	21.89	144.75	<b>P.1000</b>			
<b>TK147</b>	77.66	15.69	93.35	WITHDRAWN			
<b>422</b>	35.00	—	35.00	<b>P.2000</b>	24.00	7.20	31.20
<b>420</b>	24.00	—	24.00	<b>P.3000</b>	28.00	8.40	36.40
<b>Sona Dia</b>	14.53	3.15	17.68	<b>P.4000</b>	48.00	8.00	56.00
<b>System 304</b>	64.48	12.42	76.90	<b>P.5000</b>	80.00	—	80.00
<b>System 525</b>	WITHDRAWN			<b>P.6000</b>	110.00	—	110.00

**MANUFACTURERS' REVISED PRICES**

	<i>List £</i>	<i>Tax £</i>	<i>Total£</i>		<i>List £</i>	<i>Tax £</i>	<i>Total£</i>
<b>■ THOMAS HEINITZ</b>				<b>■ ITT-KB</b>			
CQ Junior	—	—	30.40	KS654	62.86	12.14	75.00
<b>■ HIS MASTERS VOICE</b>				KA650	WITHDRAWN		
HMV 2450	112.54	21.66	134.20	KA2010	61.55	11.85	73.40
<b>■ HITACHI SALES (UK) LTD</b>				<b>■ JAPAN PHONO MOTOR</b>			
TRQ 206	48.53	9.47	58.00	JP TP-601	34.50	6.55	41.05
TRQ 232S	54.39	10.61	65.00	<b>■ JORDAN-WATTS</b>			
TPQ 115	59.41	11.59	71.00	Module Mk II	12.00	—	12.00
TRQ 202	65.27	12.73	78.00	Jumbo	19.80	—	19.80
TRQ 707	—	—	—	Janet	19.80	—	19.80
TRQ 777	160.67	31.33	192.00	Juno	26.70	—	26.70
TRQ 262	44.39	10.61	65.00	Juliet	26.40	—	26.40
TRQ 757 D	—	—	—	Gemini	42.60	—	42.60
TRQ 730 D	72.80	14.20	87.00	Jupiter	55.20	—	55.20
TRQ 770 D	110.46	21.54	132.00				
KST 3400	102.09	19.91	122.00				
DPK 310	82.84	16.16	99.00				
<b>■ JOHN HORWITZ</b>				<b>■ KEF ELECTRONICS LTD</b>			
Stereo Stamp	00.40	—	00.40	KEFKIT 2	25.00	—	25.00
<b>■ HOWLAND-WEST LTD</b>				KEFKIT 3	36.00	—	36.00
Alignment Protractor	00.40	00.08	00.48	B139	12.50	—	12.50
Test Recorder HFS 69	1.11	00.31	1.42	B200	7.50	1.50	9.00
This is stereo EXP70	1.45	00.41	1.86	B110	6.50	1.30	7.80
Narvik	29.75	—	29.75	T15	6.00	—	6.00
Bergen	13.50	2.69	16.19	T27	5.00	—	5.00
Clearview HW1	11.00	00.82	11.82	Cresta 11	20.84	4.16	25.00
Clearview HW12	14.00	1.04	15.04	Chorale	28.50	5.69	34.19
Clearview HW14	21.75	1.63	23.38	Celeste	30.00	—	30.00
Clearview HW15LT	7.50	00.56	8.06	Concord	45.00	—	45.00
Clearview HW15HT	8.00	00.60	8.60	Cadenza	42.50	—	42.50
				Concerto	58.50	—	58.50
<b>■ IMF PRODUCTS</b>				<b>■ KF PRODUCTS LTD</b>			
IMF Studio (Export)	72.00	14.37	86.37	PF8-S	7.32	1.46	8.78
IMF Monitor	116.00	—	116.00	E138S	12.98	—	12.98
IMF Montor (Export)	137.50	—	137.50	LP6-S	12.49	2.67	15.16
IMF Professional (from)	150.00	—	150.00	LP12S	36.00	—	36.00
IMF Professional Studio (from)	85.00	18.17	103.17	<b>■ KLINGER CONTROLS LTD</b>			
Compact Transcription Series	30.00	6.15	36.15	KC91	39.00	7.60	46.60
300 Turntable	103.50	20.65	124.15	S24 (pair)	24.00	4.70	28.70
<b>■ IMHOFS LTD</b>				S35 (pair)	18.30	3.60	21.90
Junior Mk II	16.80	—	16.80	S50 (pair)	39.00	7.60	46.60
IM.100	25.90	—	25.90	S42 (pair)	33.30	6.50	39.80
IM.200	37.80	—	37.80	<b>■ JAMES B. LANSING</b>			
Type 10	43.76	3.74	47.50	Aquarius 4	88.00	—	88.00
HFU/12	56.13	5.12	61.25	Nova L88	96.00	—	96.00
HFU/12 Regency	77.70	7.80	84.50	Century L100	140.00	—	140.00
Type L	33.25	2.75	36.00	Olympus	380.00	—	380.00
Type L. Jacobean	35.97	3.03	39.00	Lancer 101	208.00	—	208.00
Imflex Mini Trolley	33.56	2.44	36.00	<b>■ LEAK</b>			
				Stereofetic	57.69	12.11	69.80
				Sandwich 200	49.90	10.48	60.38

# HAMPSTEAD HIGH FIDELITY

Present an exciting example of a stereo gramophone system assembled into a compact, well designed unit with sprayed wood finish.

The equipment shown in the photograph is as follows:—

Quad amplifier 33 and 303, Quad FM3 tuner, Thorens TD 125 turntable, SME 3009 PU arm 9", Shure cartridge M75E, T 125 Mounting frame, Work Co. Housing Unit.

Our Hampstead Showroom contains a wide selection of Quality equipment. The Work Co. unit will be available late autumn. For full particulars call or write



**HAMPSTEAD HIGH FIDELITY**

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The professional designers & suppliers of fine high fidelity systems.



MANUFACTURERS' REVISED PRICES

	List £	Tax £	Total £		List £	Tax £	Total £
Sandwich 300	65.00	13.65	78.65	■ MARCONIPHONE			
Sandwich 600	49.50	—	49.50	4248	45.07	8.68	53.75
				4261	TO BE ANNOUNCED		
■ L & H				■ METRO SOUND			
Signalmaster Mk III 6087	26.45	5.05	31.50	M.2 Record cleaning			
Stereo Decoder Module	7.85	—	7.85	sponge	00.13	00.03	00.16
				M.3 Record care kit	00.35	00.03	00.38
■ L.N.B. AUDIO LTD				M.10 Metro-mat	00.63	00.12	00.75
Para-tran 6 (pair)	—	—	40.50	M.11 Hi-fi stylus cleaning			
Para-lab 6 (pair)	—	—	52.50	kit	00.35	00.07	00.42
Para-lab-super (pair)	—	—	59.50	M.21 Metro scale stylus			
Para-lab-20 (each)	—	—	52.50	balance	00.35	00.07	00.42
				M.23 Spirit level	00.35	—	00.35
■ LOCKWOOD & CO				M.24 Lubricating kit	00.35	—	00.35
(Woodworkers) LTD				M.26 Ioniser	00.37½	—	00.37½
Mini-Slim	ON APPLICATION			M.27 Anti-static cleaning			
Minor-Slim	ON APPLICATION			cloths	00.15	—	00.15
Major-Slim	ON APPLICATION			M.28 High Fidelity			
				Maintenance kit	1.75	00.15	1.90
■ LOWTHER				M.31 Thorens anti-skating			
FM Tuner Mk VII	40.00	8.55	48.55	device	1.25	00.24	1.49
TV Sound Tuner	38.00	8.12	46.12	M.1 Metro splicer	00.85	00.16	1.01
PM2 Mk I	35.00	—	35.00	M.4 Klenzatabe kit	00.70	00.13	00.83
PM2 Mk II	50.00	—	50.00	M.7 Tape accessory kit	1.63	00.31	1.94
PM4	65.00	—	65.00	M.9 Metro Brush	00.15	00.03	00.18
PM6	22.50	—	22.50	M.12 Metro-strobe	00.63	00.12	00.75
PM6 Mk I	25.00	—	25.00	M.16 Tape recorder			
PM7	35.00	—	35.00	mechanical maintenance	2.00	00.39	2.39
Corner Reproducer				M.17 Metro splicing block	00.50	—	00.50
TP1 (model A)	165.00	—	165.00	M.18 Leader tapes	00.23	—	00.23
TP1 (model B)	180.00	—	180.00	M.19 Stop Foil	00.23	—	00.23
TP1 (model D)	145.00	—	145.00	M.20 Jointing Tape	00.23	—	00.23
Acousta Cabinet	30.00	2.25	32.25	M.23 Spirit Level	00.35	—	00.35
Mini Acousta	30.00	2.25	32.25	M.24 Lubricating kit	00.35	—	00.35
Audiovector	70.00	5.61	75.61	M.25 Tape Editing kit	1.50	—	1.50
Dual position Acousta	30.00	2.25	32.25	M.32 Cassette Head			
LIB Acousta	15.00	1.25	16.25	Cleaner	00.45	00.09	00.54
Auditorium Audiovector	75.00	6.01	81.01	M.33 C60 Blank Cassette	00.53	00.01	00.54
Auditorium Acousta	40.00	2.99	42.99	M.34 Ioniser Fluid	00.25	—	00.25
				HFS103 (pair)	25.00	5.04	30.04
				HFS202	21.50	—	21.50
■ LUXOR				■ MICRO-SEIKI			
Luxor 4987	52.41	10.09	62.50	MA-77 MK II	21.01	3.26	24.27
Luxor 4988	79.66	15.34	95.00	MA-100	63.53	11.47	75.00
Luxor 5085	124.94	24.06	149.00	MA-101	28.77	5.23	34.00
MP813	146.74	28.26	175.00	MC-4100/E	17.79	3.21	21.00
MP823	113.20	21.80	135.00	MC-4100/5	14.89	2.61	17.50
KH820	17.61	3.39	21.00	VF-3100/eII	11.57	1.53	13.10
KH520	13.42	2.58	16.00	M-2100/E	9.47	1.21	10.68
KH500	9.22	1.78	11.00	M-2100/5	6.06	00.74	6.80
SH104	30.61	5.89	36.50	VF-3100/5	8.69	1.31	10.00
SH835	52.82	10.18	63.00	M-2100/6	5.00	00.58	5.58
Luxor 5002	77.56	14.94	92.50	MSB-1 (set of 4)	4.22	00.73	4.95
Luxor 5002 with 2xKH500	96.43	18.57	115.00	MTA-41	11.00	—	11.00
				MR-111	33.49	5.14	38.63
				MR-211	59.76	9.65	69.41
■ LUX				■ MMG ASSOCIATES			
WL717	60.00	11.97	71.97	Emperor 101	33.00	—	33.00
WL515	88.00	17.56	105.56	Emperor 102	33.00	—	33.00
WL212	200.00	39.90	239.90				

# MANUFACTURERS' REVISED PRICES

	List £	Tax £	Total £		List £	Tax £	Total £
<b>Emperor Mk III</b>	TO BE ANNOUNCED			<b>■ NIVICO</b>			
<b>Emperor Studio Monitor</b>	TO BE ANNOUNCED			<b>5220</b>	61.20	11.75	72.95
<b>Emperor Custom Series</b>	ON REQUEST			<b>5240B</b>	72.75	13.97	86.72
				<b>SRP-471E-5</b>	55.32	10.63	65.95
<b>■ KEITH MONKS (Audio) LTD</b>				<b>MCT-V7E</b>	102.00	19.59	121.59
<b>Laboratory 9</b>	25.00	5.03	30.03	<b>5010U</b>	109.01	22.02	131.03
<b>Hypertone</b>	19.50	—	19.50	<b>5020U</b>	151.35	29.08	180.43
<b>ELF</b>	21.00	4.18	25.18	<b>CHR-250UB</b>	80.01	16.16	96.17
<b>D15/40 Minor</b>	30.00	—	30.00	<b>CCR-660U</b>	57.50	11.61	69.11
<b>D30/30 Major</b>	70.00	—	70.00	<b>TD-694U</b>	76.02	15.34	91.36
<b>KM70</b>	86.00	—	86.00	<b>Four Channel Stereo Tape</b>			
<b>KM70/F</b>	92.00	—	92.00	<b>Unit</b>	157.14	31.69	188.83
<b>KMAL Super ELF</b>	29.50	5.85	35.35	<b>GB-1E</b>	84.00	16.17	100.17
				<b>GB-2E</b>	26.61½	7.69½	34.31
<b>■ MORDAUNT-SHORT LTD</b>				<b>5390U</b>	34.59	6.61	41.20
<b>MS.077</b>	27.50	5.56	33.06	<b>MSL-201E</b>	76.50	15.54	92.04
<b>MS.400</b>	56.00	—	56.00	<b>MSL-501E</b>	114.91	23.18	138.09
<b>MS.700</b>	78.00	—	78.00	<b>4344U</b>	180.86	36.60	217.46
<b>■ MOTION ELECTRONICS</b>							
<b>Television Sound Monitor</b>				<b>■ ORBIT</b>			
<b>VHF only (Chassis)</b>	36.10	7.30	43.40	<b>NM22</b>	4.03	00.72	4.75
<b>VHF only (in Cabinet)</b>	39.56	8.00	47.56				
<b>UHF only (Chassis)</b>	35.65	7.21	42.86	<b>■ ORTOFON</b>			
<b>UHF only (in Cabinet)</b>	39.15	7.62	46.77	<b>Type C (without shell)</b>	13.25	2.55	15.80
<b>VHF &amp; UHF (Chassis)</b>	40.00	8.08	48.08	<b>Type CE</b>	18.25	3.51	21.76
<b>VHF &amp; UHF (in Cabinet)</b>	43.50	8.79	52.29	<b>M15</b>	19.00	3.29	22.29
				<b>MF 15 (spherical)</b>	15.00	2.59	17.59
<b>■ MUSICRAFT</b>				<b>MF 15E (elliptical)</b>	20.00	3.46	23.46
<b>10-10</b>				<b>M 15E Grey styl.</b>	13.00	2.50	15.50
<b>(complete with Tuner &amp; Speakers)</b>	—	—	144.50	<b>M 15 Blue styl.</b>	8.00	1.54	9.54
				<b>MF 15E Red styl.</b>	11.00	2.12	13.12
<b>■ NATIONAL</b>				<b>MF 15 Black styl.</b>	6.00	1.16	7.16
<b>SA-54</b>	—	—	154.04	<b>SL15/E cart.</b>	24.00	4.62	28.62
<b>SA-40</b>	96.83	19.58	116.41	<b>SL15</b>	18.25	3.51	21.76
<b>SA-420</b>	76.98	15.56	92.54	<b>Transformer module</b>	7.00	—	7.00
<b>RS-768U/S</b>	87.32	17.65	104.97	<b>RMG/309</b>	21.00	4.04	25.04
<b>RS-735U/S</b>	116.27	23.51	139.78	<b>AS212</b>	27.50	5.29	32.79
<b>Panasonic SG-999A</b>	113.92	23.03	136.95				
<b>■ NEAT CORPORATION</b>				<b>■ PEAK SOUND</b>			
<b>G30</b>	11.00	2.09	13.09	<b>840T</b>	49.50	—	49.50
<b>Lift</b>	3.00	00.57	3.57	<b>840TA</b>	87.00	16.75	103.77
<b>G30B</b>	13.00	2.47	15.47				
<b>V60MH</b>	7.00	1.33	8.33	<b>■ PEERLESS</b>			
<b>V60MHE</b>	9.50	1.80	11.30	<b>2-8 KIT</b>	5.60	00.91	6.51
<b>V70</b>	4.20	00.80	5.00	<b>10-2 KIT</b>	8.83	1.17	10.00
<b>V70E</b>	6.30	1.20	7.50	<b>3-15 KIT</b>	10.50	1.81	12.31
				<b>3-25 KIT</b>	16.80	00.94	17.74
<b>■ NIKKO ELECTRIC</b>				<b>4-30/12 KIT</b>	26.85	—	26.85
<b>FAM-12F</b>	55.00	10.97	65.97	<b>50-2</b>	9.15	00.34	9.49
<b>FAM-14</b>	75.00	14.96	89.96	<b>50-4</b>	23.00	3.17	26.17
<b>FAM-10</b>	39.00	7.78	46.78	<b>PR 20-2</b>	26.20	5.23	31.43
<b>ST 501</b>	WITHDRAWN			<b>PR 20-3</b>	35.60	6.95	42.55
<b>ST 701 B</b>	109.50	21.85	131.35	<b>PR 315</b>	28.00	5.59	33.59
<b>STA-301</b>	80.00	15.96	95.96				
<b>STA-1101</b>	198.00	39.50	237.50				



# MANUFACTURERS' REVISED PRICES

	List £	Tax £	Total £		List £	Tax £	Total £
<b>T 3300</b>	82.12	14.23	96.35	<b>Arundel AP200/A</b>	52.84	11.84	73.34
<b>T 6600</b>	155.00	26.85	181.85	<b>AP200 Stand</b>	5.25	—	5.25
<b>T 8800</b>	294.00	50.94	344.94	<b>AA60</b>	26.00	—	26.00
<b>CS 53</b>	41.13	—	41.13	<b>SC60</b>	9.00	1.73	10.73
<b>CS 63DX</b>	120.14	—	120.14	<b>AP 200/B</b>	79.50	15.30	94.80
<b>CS 66</b>	53.17	9.21	62.38	<b>AP 200/C</b>	66.00	12.70	78.70
<b>CSE 500</b>	56.76	9.99	66.75	<b>AP 200/D</b>	84.00	16.17	100.17
<b>CSE 700</b>	79.73	—	79.73				
<b>■ PLAYFAIR</b>				<b>■ RECORD HOUSING</b>			
<b>Stylus Timer</b>	00.80	00.16	00.95	<b>Lowflex</b>	51.30	3.70	55.00
<b>Cleaning Pad</b>	00.10	—	00.10	<b>Britten</b>	34.98	2.52	37.50
<b>Stylus Cleaner</b>	00.30	—	00.30	<b>Cantelina</b>	33.59	2.41	36.00
<b>Antistatic cleaning fluid</b>	00.19	—	00.19	<b>Playview Junior</b>	8.37	00.58	8.95
<b>Discoda (3 clips)</b>	00.12½	—	00.12½	<b>Playview Senior</b>	11.15	00.80	11.95
<b>Discoda (12 clips)</b>	00.40	—	00.40	<b>Scan Plan</b>	20.95	1.50	22.45
<b>Diamond styli</b>	ON REQUEST			<b>Hi-Flex Shelfframe</b>	30.04	2.16	32.20
<b>Sapphire styli</b>	ON REQUEST			<b>Recaudio Cabinet</b>	23.32	1.68	25.00
<b>Dry Splice</b>	00.19	—	00.19	<b>Audio Trolley</b>	20.48	1.47	21.95
<b>■ PYE BUSINESS COMMUNICATIONS</b>				<b>■ REVOX</b>			
<b>LBB 9050/05</b>	36.00	—	36.00	<b>A76</b>	138.42	29.58	168.00
<b>■ PYE</b>				<b>1302 or 1304</b>	177.15	37.85	215.00
<b>9123</b>	48.57	9.36	57.93	<b>1322 or 1324</b>	205.15	43.85	249.00
<b>9137</b>	84.03	16.17	100.20	<b>1102 or 1104</b>	177.15	37.85	215.00
<b>9116</b>	54.52	11.03	65.55	<b>1122 or 1124</b>	205.15	43.85	249.00
<b>1550</b>	121.27	23.35	144.62	<b>1222 or 1224</b>	213.39	45.61	259.00
				<b>HS 1302/1304/1102/1104</b>	213.39	45.61	259.00
				<b>HS 1322/1324/1122/1124</b>	238.10	50.90	289.00
				<b>HS 1222/1224</b>	246.35	52.65	299.00
<b>■ QUAD</b>				<b>■ RGD</b>			
<b>Quad, AM3/European</b>	38.00	8.55	46.55	<b>PA550</b>	58.27	11.23	69.50
<b>Quad, AM3/Overseas</b>	38.00	8.55	46.55				
<b>Quad, FM3</b>	58.00	13.05	71.05	<b>■ ROGERS DEVELOPMENTS</b>			
<b>■ RADFORD</b>				<b>Ravensbrook FET FM</b>			
<b>FMT-3</b>	60.00	12.83	72.83	<b>Tuner Case</b>	41.00	8.39	49.39
<b>Bookshelf 11</b>	32.50	—	32.50	<b>Chassis</b>	36.00	7.37	43.37
<b>Monitor 11</b>	60.00	—	60.00	<b>Ravensbourne 2 FET</b>			
<b>Auditorium 11</b>	80.00	—	80.00	<b>Tuner Case</b>	53.50	10.95	64.45
<b>Studio 12</b>	100.00	—	100.00	<b>Chassis</b>	49.50	10.13	59.63
<b>Tri-Star 50</b>	42.50	—	42.50	<b>Ravensbrook Tuner/</b>			
<b>Studio 270</b>	147.50	—	147.50	<b>Amplifier</b>			
<b>■ RADON</b>				<b>Case</b>	90.00	18.43	108.43
<b>RP60</b>	27.00	5.20	32.20	<b>Chassis</b>	82.50	16.89	99.49
<b>P100/SP25 Mk II</b>	28.00	6.06	34.06	<b>Ravensbourne Compact</b>	WITHDRAWN		
<b>P100/SL65</b>	30.00	6.50	36.50	<b>Ravensbrook 3-Speaker</b>			
<b>Series 404 Mk II</b>	22.10	4.33	26.43	<b>System (pair)</b>	49.50	10.13	59.63
<b>Amethyst SC/1</b>	11.25	2.17	13.42	<b>Monitor</b>	83.50	16.28	99.78
<b>Emerald SC/2</b>	16.00	3.47	19.47	<b>■ ROTEL</b>			
<b>Opal SC/3</b>	24.00	—	24.00	<b>RT620</b>	TO BE ANNOUNCED		
<b>Sapphire SC/4</b>	34.00	—	34.00	<b>RT320</b>	41.50	8.49	49.99
<b>Topaz SC/6</b>	60.00	—	60.00	<b>RX200</b>	63.19	12.93	76.12
<b>Pearl SC/5</b>	40.00	—	40.00	<b>RX400</b>	79.00	16.18	95.18
				<b>■ SANSUI</b>			
				<b>SR1050C</b>	64.53	12.91	77.44
				<b>SR2050C</b>	80.18	16.04	96.22

**MANUFACTURERS' REVISED PRICES**

	<i>List £</i>	<i>Tax £</i>	<i>Total£</i>		<i>List £</i>	<i>Tax £</i>	<i>Total£</i>
<b>Sansui TU555</b>	67.76	13.55	81.31	<b>M44-7</b>	8.25	1.59	9.84
<b>Sansui TU666</b>	76.62	15.32	91.94	<b>M55E</b>	10.50	2.02	12.52
<b>Sansui TU777</b>	82.35	16.47	98.82	<b>M75E Type 2</b>	17.25	3.32	20.57
<b>Sansui 200</b>	72.31	14.46	86.77	<b>M75-6 Type 2</b>	13.50	2.60	16.10
<b>Sansui 300</b>	84.55	16.73	101.28	<b>M75E 95G Type 2</b>	18.75	3.61	22.36
<b>Sansui 600L</b>	146.93	29.39	176.32	<b>M75G Type 2</b>	14.25	2.74	16.99
<b>Sansui 350</b>	111.92	22.38	134.30	<b>M75EJ Type 2</b>	15.75	3.03	18.78
<b>Sansui 800</b>	129.05	25.81	154.86	<b>V15-11 (improved)</b>	33.00	6.35	39.35
<b>Sansui 5000X</b>	189.50	37.90	227.40	<b>SFG 2 Stylus Gauge</b>	3.60	00.69	4.29
<b>Sansui 2000</b>	139.50	27.90	167.40	<b>M64-E</b>	19.20	-	19.20
<b>Sansui 8</b>	236.58	47.32	283.90	<b>TTR 101</b>	1.00	0.32	1.32
<b>SD7000</b>	328.76	66.31	397.84	<b>■ SINCLAIR RADIONICS</b>			
<b>Sansui SL5</b>	39.11	7.82	46.93	<b>Project 60</b>	23.92	-	23.92
<b>Sansui SL7</b>	42.38	8.48	50.86	<b>FM Tuner</b>	20.80	4.20	25.00
<b>Sansui SP30</b>	27.11	5.42	32.53	<b>Q16</b>	7.48	1.50	8.98
<b>Sansui SP50</b>	43.13	8.63	51.76	<b>System 2000</b>	10.48	2.12	12.60
<b>Sansui SP300</b>	97.50	-	97.50	<b>■ SKANDIA ELECTRONICS</b>			
<b>Sansui MC50</b>	128.95	25.79	154.74	<b>SK 120</b>	176.00	38.61	214.61
<b>■ SANYO</b>				<b>RS 82</b>	92.40	20.27	112.67
<b>TP-78</b>	45.71	9.24	54.95	<b>SK 308</b>	150.00	32.90	182.90
<b>DC-60E</b>	69.84	14.11	83.95	<b>■ S.M.E. LTD</b>			
<b>DC-534</b>	116.42	23.53	139.95	<b>Model 3009</b>	27.72	5.54	33.26
<b>MR801</b>	57.36	11.59	68.95	<b>Model 3012</b>	29.52	5.90	35.42
<b>SX-X III</b>	14.93	3.02	17.95	<b>Base</b>	13.62	2.72	16.34
<b>DC91E</b>	98.12	19.83	117.95	<b>Motor Board</b>	4.35	00.87	5.22
<b>DS93E</b>	81.48	16.47	97.95	<b>Acrylic Lid</b>	8.67	1.73	10.40
<b>■ SCAN-DYNA</b>				<b>Spring Mounts</b>	4.02	00.80	4.82
<b>3000</b>	WITHDRAWN			<b>Hinges (each)</b>	2.55	-	2.55
<b>■ SCHWEIZER</b>				<b>P1 Spacer</b>	00.84	00.17	1.01
<b>Record Fluid</b>	00.33	-	00.33	<b>Mounting Brackets</b>	1.26	00.25	1.51
<b>Record Grip</b>	00.29	-	00.29	<b>3009 Mounting Boards</b>	2.88	00.58	3.46
<b>Record System</b>	00.62	00.13	00.75	<b>3012 Mounting Boards</b>	3.51	00.70	4.21
<b>■ SCOTCH</b>				<b>Model 2000</b>	34.47	6.89	41.36
<b>Accessory Kit</b>	1.73	-	1.73	<b>■ SONAB LTD</b>			
<b>■ SHARP</b>				<b>75-S Mk I</b>	55.05	10.90	65.95
<b>STA31D</b>	93.08	17.92	111.00	<b>Sonab R7000</b>	184.27	36.73	221.00
<b>STA32L</b>	117.38	22.60	139.98	<b>Sonab V-1</b>	31.56	5.94	37.50
<b>RD706</b>	46.92	9.48	56.40	<b>Sonab OA-4</b>	44.95	8.55	53.50
<b>RD708V</b>	76.18	15.40	91.58	<b>Sonab OA-5</b>	58.39	11.11	69.50
<b>RD711D</b>	72.17	14.59	86.76	<b>Sonab OA-6</b>	137.25	-	137.25
<b>RD712D</b>	60.15	12.16	72.30	<b>■ SONICS CORPORATION</b>			
<b>RD423E</b>	46.11	9.32	55.43	<b>AS-57 (Pair)</b>	12.39	2.61	15.00
<b>GS5400</b>	72.86	14.04	86.90	<b>AS-303</b>	31.50	-	31.50
<b>GS5500</b>	111.72	21.50	133.22	<b>AS-330</b>	59.50	-	59.50
<b>GS5600</b>	160.29	30.85	191.14	<b>AS-440</b>	72.00	-	72.00
<b>■ SHURE ELECTRONICS LTD</b>				<b>■ SONOTONE</b>			
<b>M3D</b>	6.00	1.16	7.16	<b>8T4A-S/S</b>	1.75	00.31	2.06
<b>M31E</b>	9.75	1.88	11.63	<b>9TA/9TAG-S/S</b>	2.50	00.45	2.95
<b>M32E</b>	9.00	1.73	10.73	<b>9TA/9TAG-S/D</b>	3.25	00.58	3.83
<b>M32-3</b>	8.25	1.59	9.84	<b>9TAHC/9TAHC-G-S/S</b>	2.50	00.45	2.95
<b>M44C</b>	8.25	1.59	9.84	<b>9TAHC/9TAHC-G-S/D</b>	3.25	00.58	3.83
<b>M44E</b>	9.75	1.88	11.63	<b>2109</b>	1.38	00.25	1.63
<b>M44-5</b>	9.00	1.73	10.73	<b>2139</b>	1.38	00.25	1.63
				<b>2509</b>	1.95	00.35	2.30
				<b>2529</b>	2.10	00.38	2.48
				<b>2539</b>	1.95	00.35	2.30

# MANUFACTURERS' REVISED PRICES

	List £	Tax £	Total £		List £	Tax £	Total £
3509 S/S	2.25	00.40	2.65	■ SYNCHROTAPE Editing Kit	1.50	00.36	1.85
3509 S/D	2.59	00.46	3.05				
3549 S/S	2.35	00.42	2.77				
3549 S/D	2.69	00.48	3.17				
3559 S/S	2.35	00.42	2.77				
3559 S/D	2.69	00.48	3.17				
■ SONY (UK) LTD				■ TANDBERG			
Sony VC-8E	22.97	4.65	27.62	Hi-Fi FM	60.73	12.27	73.00
TTS-3000	65.36	13.21	78.57	Solvsuper 1171	79.03	15.97	95.00
PS1800	96.17	19.49	115.66	1521	69.89	14.11	84.00
PS1500	55.07	11.12	66.19	1522	79.03	15.97	95.00
ST-80F	39.71	8.01	47.72	1541	75.28	15.22	90.50
ST5600	51.09	10.36	61.45	1542	84.85	17.15	102.00
STR-122	42.11	8.50	50.61	1521F	93.24	18.76	112.00
TC106	46.91	9.48	56.39	1541F	99.41	20.09	119.50
TC120	51.09	10.36	61.45	1521SL	97.33	19.67	117.00
TC108	51.09	10.36	61.45	11-1	154.00	—	154.00
TC124	78.39	15.85	94.24	11-2M	160.56	32.44	193.00
TC800B	69.07	14.08	83.15	1741	59.48	12.02	71.50
TC252	79.98	16.17	96.15	1721	55.74	11.26	67.00
TC540	120.10	24.26	144.36	4021X	144.75	29.25	174.00
TC252D	58.35	11.79	70.14	4041X	144.75	29.25	174.00
TC366	88.30	17.83	106.13	3041X	89.01	17.99	107.00
TC127	55.93	11.31	67.24	6041X	156.40	31.60	188.00
SS-1000 Monitor	32.00	—	32.00	6021X	156.40	31.60	188.00
SS 2800	WITHDRAWN			3021X	89.01	17.99	107.00
SS 3300	123.50	—	123.50	1841	56.57	11.43	68.00
HP.122	79.20	15.99	95.19	Tan 7	23.29	4.71	28.00
HP.488	129.62	26.28	155.90	Tan 10 and Tan 11	15.81	3.19	19.00
				Tan 12	17.47	3.53	21.00
				Tan 13	24.13	4.87	29.00
				Tan 15	45.00	—	45.00
				Tan 18	17.47	3.53	21.00
				Tan 19	19.13	3.87	23.00
				Tan 20	19.97	4.03	24.00
■ SOUND STUDIO LTD				System: FM Tuner- Amplifier, Farnell- Tandberg 3000X Recorder, 2-Tan 7 Speakers			
Folded Horn	—	—	21.00	196.32	39.68	236.00	
Opus	—	—	21.00				
■ STANDARD				■ TANNOY			
TU-108 EE	36.53	6.61	43.14	Varilutance (2 Diamonds)	12.00	2.60	14.60
				Varilutance (1 Diamond, 1 Sapphire)	9.50	2.06	11.56
				Varilutance (2 Sapphires)	7.00	1.52	8.52
■ STENTORIAN				■ TELEFUNKEN			
H.F.812	5.30	1.07	6.37	T201	65.19	12.39	77.58
H.F.816	8.72	1.76	10.48	T250	157.64	29.95	187.59
H.F.912/67	6.61	1.33	7.94	Concertino 301	97.38	18.51	115.89
H.F.1012	6.37	1.29	7.66	R 205	60.87	11.56	72.43
H.F.1016	10.17	2.05	12.22	Operette 201	74.99	14.24	89.23
H.F.1214	17.43	—	17.43	Concerto Hi-Fi 101	112.80	21.44	134.24
H.F.1214/67	19.29	—	19.29	Hi-Fi Compact 2000	111.59	21.20	132.79
H.F.1216	26.72	—	26.72	204TS	100.45	20.05	120.50
T.359	2.23	00.45	2.68	M207	92.01	18.36	110.37
T.812/67	6.32	1.28	7.60	250 Hi-Fi	114.80	22.91	137.71
C14	22.38	1.82	24.20				
LC93	16.83	3.40	20.23				
LC94	25.90	5.24	31.14				
LC95	58.59	—	58.59				
C15	24.25	1.97	26.22				
C16 Mahogany	28.26	2.29	30.55				
C16A Walnut	29.20	2.37	31.57				
■ J. E. SUGDEN & CO LTD							
R 21 and R 51	60.00	12.29	72.29				

MANUFACTURERS' REVISED PRICES

	List £	Tax £	Total£		List £	Tax £	Total£
<b>Endless Tape Cassette</b>	1-93	00-38	2-31	■ <b>TRIPLETONE MANUFACTURING</b>			
<b>RB40/41</b>	12-78	2-43	15-21	<b>FM Tuner Mk II (stereo)</b>	29-80	6-70	36-50
<b>WB60/61</b>	19-18	3-64	22-82	<b>FM tuner Mk II (mono)</b>	24-67	5-55	30-22
<b>RB70H</b>	23-44	4-45	27-89	<b>FM tuner chassis (stereo)</b>	27-50	6-19	33-69
<b>L250 Hi-Fi</b>	34-52	6-55	41-07	<b>FM tuner chassis (mono)</b>	22-50	5-06	27-56
<b>WB50</b>	17-47	3-31	20-78	<b>MPX decoder</b>	8-00	-	8-00
■ <b>TELETON</b>				<b>Concerto Mk II</b>	15-30	3-45	18-75
<b>GT.101</b>	36-84	7-09	43-93	<b>Concerto Mk III</b>	18-75	-	18-75
<b>F.2300</b>	44-53	8-57	53-10	<b>8 in Mk II</b>	4-50	1-01	5-51
<b>F.2000</b>	WITHDRAWN			<b>10 in Mk II</b>	4-88	1-10	5-98
<b>R.4200</b>	WITHDRAWN			■ <b>UHER</b>			
<b>TFS 50</b>	66-79	12-86	79-65	<b>4200</b>	145-00	27-41	172-41
<b>7 at 1</b>	96-94	18-67	115-61	<b>4400</b>	145-00	27-41	172-41
<b>7 at 20</b>	WITHDRAWN			<b>Royal de luxe</b>	215-00	40-64	255-64
<b>CR 55</b>	105-03	20-23	125-26	<b>Royal de luxe (C)</b>	190-00	35-91	225-91
<b>10 at 1</b>	WITHDRAWN			<b>Pilot 1200</b>	PRICE ON APPLICATION		
<b>STP 801</b>	44-33	8-53	52-86	<b>4000 Report L</b>	115-00	21-74	136-74
<b>999</b>	WITHDRAWN			<b>Variocord Mono</b>	95-00	17-96	112-96
<b>FXB 510D</b>	55-64	10-52	66-16	<b>Variocord Stereo</b>	130-00	24-58	154-58
<b>SA 1003</b>	4-75	00-82	5-57	<b>714</b>	45-00	8-51	53-51
<b>SB 1202</b>	9-31	1-79	11-10	<b>5000 Universal</b>	118-00	22-30	140-30
<b>SB 1602</b>	18-46	3-46	21-92	<b>5000 Language Tutor</b>	125-00	-	125-00
<b>SB 25</b>	25-91	4-98	30-89	<b>724 Stereo</b>	99-00	18-71	117-71
<b>SD 2100</b>	35-50	-	35-50	<b>Compact Report Stereo</b>	TO BE ADVISED		
<b>2S605</b>	60-72	11-68	72-40	<b>A401 Timer</b>	14-30	-	14-30
				<b>Z124</b>	14-40	2-72	17-12
■ <b>THORENS</b>							
<b>TD150A Mk II</b>	36-50	7-90	44-40	■ <b>VAN DER MOLEN</b>			
<b>TD150AB Mk II</b>	39-50	8-55	48-05	<b>VR47</b>	53-90	10-89	64-79
<b>TD125</b>	62-50	13-53	76-03	<b>S2</b>	15-65	3-01	18-66
<b>TD150 Mk. II</b>	28-50	6-12	34-62	<b>S3</b>	23-99	-	23-99
<b>TD125AB</b>	95-00	20-57	115-57	<b>S4</b>	27-48	5-29	32-77
<b>TD125 Teak Plinth</b>	6-00	1-30	7-30	<b>S5</b>	38-31	7-37	45-68
<b>TD150 Teak Plinth</b>	3-50	0-76	4-26	<b>Super Sonic 77</b>	64-87	12-49	77-36
■ <b>TOSHIBA</b>				<b>Super Sonic 77 MX</b>	71-04	13-68	84-75
<b>SP790</b>	283-25	46-02	204-17	<b>Sonic 88 MX</b>	77-85	14-99	92-84
■ <b>TRANSCRIPTORS LTD</b>				<b>Sonic 88</b>	71-52	13-76	85-28
<b>Transcriptor Fluid Arm</b>	22-00	4-29	26-29				
<b>Stylus Scale</b>	3-30	00-65	3-95	■ <b>WAL</b>			
<b>Sweep Arm</b>	3-40	00-66	4-06	<b>Stereo Pre-amplifier</b>	11-00	-	11-00
<b>Stylus Brush</b>	2-00	00-39	2-39	<b>Wal D-Mag</b>	3-00	00-65	3-65
<b>Hydraulic Reference</b>				<b>Wal Professional Tape</b>			
<b>Turntable (with arm)</b>	90-00	17-55	107-55	<b>Eraser</b>	8-93	1-94	10-87
<b>Saturn Turntable (with arm)</b>	58-00	11-60	69-60	■ <b>WHARFEDALE</b>			
■ <b>TRIO</b>				<b>Wharfedale 100.1</b>	115-38	23-62	139-00
<b>KT1000A</b>	-	-	52-50	<b>DC9</b>	91-31	18-69	110-00
<b>KT2001</b>	53-85	8-13	61-98	<b>Unit 3 kit</b>	10-38	2-12	12-50
<b>KT5000</b>	79-84	12-41	92-25	<b>Unit 4 kit</b>	18-00	-	18-00
<b>KT7001</b>	123-54	20-46	144-00	<b>Unit 5 kit</b>	26-00	-	26-00
<b>KR2120</b>	78-09	12-61	90-70				
<b>KR4140</b>	115-45	19-16	134-61				
<b>KR6160</b>	163-07	26-12	189-19				
<b>KR7070</b>	269-00	41-63	310-63				
<b>KX7010</b>	57-72	11-68	69-40				

## MANUFACTURERS' REVISED PRICES

	<i>List £</i>	<i>Tax £</i>	<i>Total £</i>
<b>8 Bronze RS/DD</b>	3.94	00.81	4.75
<b>Super 8 RS/DD</b>	6.85	1.40	8.25
<b>Super 10 RS/DD</b>	11.21	2.29	13.50
<b>Denton</b>	16.56	3.39	19.95
<b>Dovedale 111</b>	45.00	—	45.00
<b>Melton</b>	35.00	—	35.00
<b>Rosedale</b>	65.00	—	65.00
<b>Super Linton</b>	20.71	4.24	24.95
<b>Triton</b>	26.98	5.52	32.50

### ■ WILSON STEREO LIBRARY

<b>Blank Disc</b>	—	—	00.70
<b>Side Thrust Corrector</b>	—	—	00.45

### ■ WOOLLETT AUDIO STATICS

<b>Claremont</b>	24.90	—	24.90
<b>Kelsey Bass</b>	44.00	—	44.00
<b>Frensham Bass</b>	44.00	—	44.00
<b>Leven</b>	24.90	—	24.90
<b>Grasmere Moderna</b>	61.75	—	61.75
<b>Grasmere Futura</b>	63.75	—	63.75
<b>Como</b>	32.75	—	32.75
<b>Addabass</b>	12.80	—	12.80
<b>Esdiyn</b>	44.00	—	44.00
<b>XS1 and XS2</b>	3.75	—	3.75
<b>SEC3</b>	12.80	—	12.80

### ■ WORDEN AUDIO DEVELOPMENTS LTD

<b>MK III Articulated Arm</b>	24.50	5.50	30.00
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### ■ WYE ELECTRONICS LTD

<b>Stereo 525</b>	19.58	—	19.58
<b>1300 Hi-Fi</b>	37.80	—	37.80

### ■ YAMAHA

<b>YP70</b>	57.91	10.82	68.73
<b>AA70</b>	97.03	18.14	115.17
<b>NS10</b>	31.50	—	31.50
<b>NS15</b>	48.75	—	48.75
<b>NS20</b>	78.00	—	78.00
<b>NS30</b>	120.00	—	120.00
<b>MC40</b>	92.33	17.26	109.59
<b>MC50A</b>	140.85	26.33	167.18
<b>MC50B</b>	156.50	29.25	185.75
<b>MC50</b>	128.33	23.99	152.32
<b>MC600</b>	140.85	26.33	167.18

# Directory of Constructional Kits

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ RICHARD ALLAN RADIO LTD

Bradford Road, Gomersal, Cleckheaton, Yorkshire. Tel: Cleckheaton 2442/3.

### Twin Assembly ★

Speaker kit comprising CC8 bass/mid-range driver and 460TC treble unit, CN54 crossover, BAF wadding, Vynair fret material (with choice of three patterns), foam backing sheet, detailed assembly instructions, fixing screws, terminals, etc. FR: 40Hz-17kHz. HC: 10W RMS. Impedance: 4-8 or 15 ohms. Recommended cabinet size: 20 × 12 × 9in. Price: £8.95 (plus £2.02 PT).

### Triple Assembly

Speaker kit comprising CG12 bass driver, CP8 mid-range unit, CB4 treble unit,  $\frac{1}{4}$ -section printed circuit crossover, BAF wadding, Vynair fret material (with choice of three patterns), foam backing sheet, detailed assembly instructions, fixing screws, terminals, etc. FR: 30Hz-17kHz. HC: 15W RMS. Impedance: 4-8 or 15 ohms. Recommended cabinet size: 25 × 15 $\frac{1}{2}$  × 12 $\frac{1}{2}$ in. Design based on Richard Allan Pavane enclosure. Price: £20.35 (no PT).

### Super Assembly

Speaker kit comprising CG12 Super bass driver, CB8 mid-range unit, CB4 treble unit,  $\frac{1}{4}$ -section crossover network. FR: 30Hz-17kHz. HC: 20W RMS. Impedance: 8 or 15 ohms. Recommended cabinet size: 25 × 15 $\frac{1}{2}$  × 12 $\frac{1}{2}$ in. Design based on Richard Allan Pavane enclosure. Price: £24 (no PT).

## ■ CONNOISSEUR

A. R. Sugden & Co (Engineers) Ltd, Market Street, Brighouse, Yorkshire. Tel: Brighouse 2142. Cables: Connoisseur, Yorkshire.

### BD1 Turntable kit

Description and specification as for BD1 motor unit. (See Motor Unit section.) Easy one-hour assembly. No soldering. Price: £10.75 (plus £2.53 PT).

## ■ EAGLE INTERNATIONAL

Heather Park Drive, Wembley, HA1 1SU. Tel: 01-903 0144.

### KT3

Three-way speaker kit with crossover. One 8 $\frac{1}{4}$ in. bass driver, 2 $\frac{3}{4}$ in. concentric mid-range radiator, 2 $\frac{3}{4}$ in. tweeter. FR: 30Hz-16kHz. Crossover: 3kHz. Impedance: 8 ohms. L/C crossover mounted on panel with colour coded terminals. Full cabinet making plans included. Price: £10.50.

## ■ EATON AUDIO FITMENTS

Leopold Street, Long Eaton, Nottingham, NG104QF. Tel: Long Eaton 2662/2818.

### Wharfedale Unit 3 cabinet kit

Made to Wharfedale specification from  $\frac{1}{2}$ in. material accurately machined for simplicity of assembly, with the main parts veneered (unpolished) in teak, mahogany and walnut. All kits are complete with screws for fixing the back, bolts for fixing fret panel, and fret material. Baffle holes are cut and cabinets veneered all four sides. Prices: small cabinet 14 × 9 $\frac{3}{4}$  × 8 $\frac{3}{4}$ in £5-15. Large cabinet 11 $\frac{1}{2}$  × 21 × 9 $\frac{1}{2}$ in £5-90.

### Wharfedale Unit 4 cabinet kit

Made to Wharfedale specification from 17mm material accurately machined for ease of assembly. Main parts veneered (unpolished). All kits complete with screws, bolts and fret material. Finish: teak veneer. Largest size recommended: 24 × 14 × 12in. Price: £8.25.



Richard Allan Twin Assembly

★ Indicates entry is illustrated

### Wharfedale Unit 5 cabinet kit

Details as Unit 4 cabinet kit except size  $29 \times 17 \times 11\frac{3}{4}$ in. Price: £10 (teak).

### Wharfedale Pipe kits

Column cabinets using specially designed filter and absorbent pads of bonded acetate fibre. Designed for a single full range 8in speaker (rec. Super 8/RS/DD). FR: 40Hz-20kHz. Suitable for 15 ohm amplifiers; other impedances by matching transformer WMT1. Dimensions: 3ft high by 1in diameter. Power handling capacity: 6W RMS. Also kit for 10in drive unit (Super 10/RS/DD). FR: 30Hz-20kHz. Prices on request.

### Mullard Unilex kits

Cabinets suitable for Mullard Unilex system available. Full details and prices on request.

## GOODMANS LOUDSPEAKERS LTD

Downley Road, Havant, Hampshire, PO9 2NL.  
Tel: Havant 6344. Telex: 86296.

### DIN 20 Kit

A complete kit of parts (except timber) for building a two-unit speaker system. Comprehensive instructions including exploded diagrams. No soldering necessary. System is combination of reflex and infinite baffle principles. One 8in bass driver, one 1in dome tweeter. Crossover: 4kHz. Interior volume: 22 litres. FR: 45Hz-22kHz (DIN 45:500). HC: 20W (DIN). Minimum amplifier power: 10W. Impedance: 4 ohms. Connection: DIN plug and cable. Size:  $19 \times 10\frac{1}{2} \times 9\frac{1}{4}$ in. Price: to be announced.

## HEATHKIT

Manufactured by Heath (Gloucester) Ltd,  
Bristol Road, Gloucester.  
Tel: Gloucester 29451.

### TFM-1

Tuner. Comprises TFM-T1 tuner unit and TFM-1S (stereo) IF strip and power supply. Range: 88-108MHz. Variable tuning. Ratio detector. Sensitivity:  $2\mu\text{V}$  for 20dB quieting. Aerial input 75 ohms coaxial. Output: 250mV. Multiplex decoder fitted. All transistor. Mains: 200-250V 50-60Hz. Size:  $15\frac{3}{8} \times 3\frac{3}{8} \times 10\frac{1}{4}$ in. Price: £27 for both units. Cabinet £4. Also available ready assembled.

### AFM-2 ★

Transistor AM/FM stereo-mono tuner. Range: VHF 88-108MHz, MW 192-555m, LW 1,000-1,800m. Variable tuning. Ratio detector. AFC. AGC. 18 transistors, 7 diodes. Sensitivity:  $2\mu\text{V}$  for 20dB quieting. Aerial input (VHF): 75 ohms coaxial. Output: 300mV with 30% modulation. Stereo multiplex decoder fitted. Automatic stereo indicator light. Edge-lit slide rule scale and flywheel tuning. Internal AM ferrite rod aerial.

Pre-assembled and aligned front-end. Separate AM and FM printed boards. Walnut or teak veneered cabinet optional extra. Mains: 105-125V, 210-250V 50-60Hz. Consumption: 10W. Size:  $15\frac{1}{2} \times 10\frac{1}{4} \times 3\frac{3}{8}$ in. Weight (less cabinet): 8lb. Price (kit): £41.

### AJ-14

FM stereo tuner. 88-108MHz. Variable tuning. Ratio detector. Four-stage IF amplifier. Sensitivity:  $5\mu\text{V}$ . Aerial impedance: 300 ohms balanced, 75 ohms coaxial. Output: 700mV. Decoder included. Mains: 105-125, 230-250V AC. Size:  $11\frac{3}{4} \times 9\frac{3}{4} \times 2\frac{3}{8}$ in. Weight: 4 $\frac{1}{2}$ lb. Finish: walnut or teak. Prices: AJ-14 in kit form £27; cabinet in either finish £35.00 extra.

### AR-27 ★

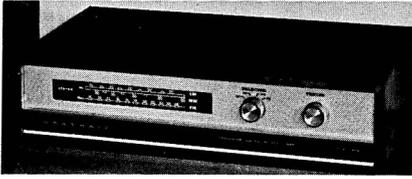
FM mono tuner/amplifier. 88-108MHz. Variable tuning. Ratio detector. Sensitivity:  $5\mu\text{V}$ . Aerial impedance: 300 ohms balanced. Output: 7W (music). Output impedance: 4-16 ohms. FR 25Hz-70kHz  $\pm 1\text{dB}$  (at 1W). PU input: 5mV. HD  $< 1\%$ . 13 transistors, 6 diodes. Mains: 105-125V, 210-240V AC. Horizontal or vertical mounting. Size:  $3 \times 12 \times 10\frac{3}{8}$ in. Finish: walnut veneer. Prices: AR-27 in kit form £25, cabinet £35.00 extra.

### AR-29

AM/FM stereo tuner/amplifier. Range: FM 88-108MHz, MW 185-560 metres. Variable tuning. Centre-zero meter tuning indicator. Signal strength meter. Aerial input: 300 ohms balanced, 75 ohms coaxial. Sensitivity: (FM)  $1.8\mu\text{V}$  (1.5 $\mu\text{V}$  typical) for 20dB quieting; (AM) external aerial  $30\mu\text{V}$  at 500 metres,  $20\mu\text{V}$  at 212 metres. Stereo decoder fitted. Stereo beacon. Inputs: magnetic PU 2.2mV, tape 180mV, aux 180mV, tape monitor 180mV. Output: 35W per channel into 8 ohm load (25W into 16 ohms). Controls: pushbutton input selectors; linear slider controls for volume, bass, treble and balance; tuning; pushbuttons for mains on-off, speaker switching, tone, loudness, mute and blend. HD:  $< 0.1\%$  at 1kHz with 1W output,  $< 0.25\%$  from 20Hz-20kHz at 35W output. H and N: (PU) -65dB, (tape and aux) -75dB. Output impedance: 4-16 ohms each channel. Regulated power supply. All inputs fitted preset gain controls. FET FM tuner. Integrated circuit (IC) stereo decoder. Black glass dial, all markings disappear when set switched off. AC outlet sockets on rear. Mains: 105-125 or 210-250V AC 50/60Hz. Consumption: 55W to 240W. Size:  $16\frac{3}{4} \times 5\frac{1}{2} \times 14\frac{1}{2}$ in. Finish: oiled pecan wood. Price: (kit) £172; (cabinet) £10 extra.

### AA-29

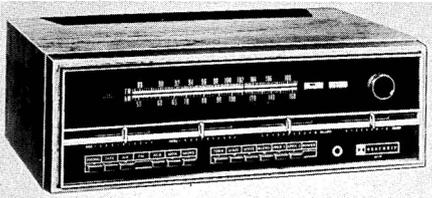
Integrated stereo amplifier. Specification the same as the amplifier section of AR-29 tuner-amplifier. Price: (kit) £70; (cabinet) £10 extra.



Heathkit AFM-2



Heathkit AR-27



Heathkit AR-19 tuner/amplifier



Heathkit TSA-12



Heathkit AR-14



Heathkit AR-17

**AJ-29**

AM/FM stereo tuner. Specification the same as the tuner section of AR-29 tuner-amplifier. Price: (kit) £107; (cabinet) £10 extra.

**AR-19 ★**

AM/FM stereo tuner/amplifier. Range: FM 88-108MHz, MW 187-545m. Variable tuning. Aerial impedance: 300 ohms balanced, 75 ohms coaxial. Output: 20W RMS per channel. FR: 6Hz-35kHz -1dB (at 1W). HD <0.1%. PU input: 2-4mV. 108 transistors, 45 diodes. Five integrated circuits. Flywheel tuning. Linear motion bass, treble and volume controls. Internal ferrite rod for AM. Finish: oiled pecan wood with black front panel. Prices: £118 in kit form; AE-19 cabinet £10 extra.

**TSA-12 ★**

Integrated stereo transistor amplifier. Inputs: PU 5mV 47K, radio 300mV 180K, aux 300mV 180K. Controls: selector, balance, volume, bass -15dB+14dB at 20Hz, treble -12dB and +14dB at 20kHz. Output: 12W RMS per channel (8 ohm load). 8W RMS per channel (15 ohm load). HD 1% or less, 20Hz-20kHz at rated output. Noise level: -50dB (PU), -60dB (radio and aux). Mains: 100-125, 200-250V 50-60Hz. Size: 15½ × 10 × 3¾in. Weight: 11lb. Price (kit): £36; cabinet £10 extra.

**AA-15**

Transistorised stereo integrated amplifier. Power output: 150W music. Distortion: <0.5% at full output. FR: 8Hz-40kHz ±1dB at 1W. Controls: volume, balance, treble, bass, various switch functions, tuner input jack and L.S. switch. Psn: 120-240V 50Hz. Price: (kit) less cabinet £84. Walnut veneered cabinet £10.

**AR-14 ★**

FM stereo, with multiplex decoder. Range: 87.5-108MHz. Tuning: variable. Ratio detector. Sensitivity: 2µV. Aerial impedance: 75 ohms coaxial, 300 ohms balanced. Output voltage: 300mV. AFC. Power output: 10W RMS per channel. HD better than 1% 20Hz-20kHz. FR: 15Hz-50kHz at 10W. Feedback: 38dB. Noise level: 80dB (power amp). Output impedance: 4-16 ohms. Output transistors: 2N2148/40465. Psn: 120 or 240V 50 or 60Hz. Inputs: gram, 4-5mV, 50K, 60dB noise level; aux, 300mV, 100K, 65dB noise level. Controls: source, treble, bass, volume, phase, tuning. Dimensions: 3¾ × 15¼ × 12in. Price: in kit form £59 (including PT). Carriage extra.

**AR-17 ★**

FM stereo tuner/amplifier with multiplex decoder. Range: 87-108MHz. Ratio detector. Sensitivity: 2.5µV. Aerial: 75 ohms coaxial or 300 ohms balanced. AFC. Power output: 5W RMS per channel. HD better than 1% 20Hz-30kHz. FR: 25Hz-35kHz ±1dB. Feedback:

★ Indicates entry is illustrated

32dB. N/L: 80dB (power amp). Output impedance 4-16 ohms. Output transistors: BD131, BD132. Psn: 120-240V 50 or 60Hz. Inputs: gram, 5mV, 50K, -45dB noise level; aux, 300mV, 150K, -55dB noise level. Controls: function, tuning, volume, tone. Dimensions: 3 × 12 × 10 $\frac{3}{8}$ in. Price: in kit form £36-50. Carriage extra.

#### AA-14

Stereo amplifier. Power output: 10W per channel, 4-16 ohms. HD 0.5% or less at 1kHz. FR: 15Hz-50kHz  $\pm$  1dB. Feedback: 38dB. N/L: 80dB power amp. Output transistors 2N2148/40465. Psn 120-240V 50 or 60Hz. Dimensions: 3 $\frac{1}{2}$  × 12 $\frac{1}{2}$  × 9 $\frac{5}{8}$ in. Inputs: aux, 300mV, 180K, -65dB N/L; tuner, 300mV, 18K, -63dB N/L; gram, 4-5mV, 47K, -60dB N/L. Controls: bass, treble, source, volume. Psn 120-240V 50 or 60Hz. Price: in kit form £32. Carriage extra.

#### AD-27

FM stereo compact system. Transistorised. Range: 87.5-108MHz. Variable tuning. AFC. Multiplex decoder fitted. Controls: FM tune, source, volume, balance, bass, treble, phase, power on/off, speakers on/off, stereo/mono. Power output: 10W RMS per channel. FR: 6Hz-100kHz  $\pm$  3dB. Output impedance: 4-16 ohms. Distortion: less than 1% from 12Hz-60kHz. Motor unit: BSR MA70. Pickup cartridge: Shure M44MB. Overall dimensions: 7 $\frac{1}{2}$  × 21 $\frac{7}{8}$  × 14 $\frac{1}{2}$ in. Speakers: Berkeley, Avon, Ambassador. Finish: teak or walnut. Price: in kit form £92. Carriage extra.

#### AJ-15

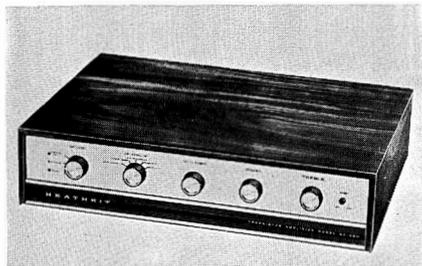
Transistorised stereo tuner. Features: FET devices in tuner section; crystal filters in IF stages; integrated circuits in IF stages; noise suppression circuitry; adjustable stereo phase control; two tuning meters with variable tuning; two adjustable stereo phone outputs; outputs for amplifier and tape recorder; panel illumination. Price: (kit) less cabinet £115. Walnut veneered cabinet £10. Carriage extra.

#### AA-22U ★

Transistorised stereo integrated amplifier. Inputs: PU 6mV, radio 250mV, tape 250mV, aux 1 250mV, aux 2 250mV. Controls: balance, selector switch, mode switch, volume, bass, treble, filter, filter (3-position); flat, 4kHz, 8kHz, 12dB/octave). Noise -50dB on PU, -65dB all other inputs. Output: 20W per channel RMS. Distortion 0.3% at 20W. FR: 15Hz-30kHz 1dB. Feedback 35dB. Output: imp 4, 8 or 16 ohms. Pre-set gain controls accessible from the front. Mains 110, 200-250V 50-60Hz. Size: 15 $\frac{1}{2}$  × 3 $\frac{7}{8}$  × 12 $\frac{3}{8}$ in. Price (kit): less cabinet £46; cabinet £4 extra.

#### STR-1 ★

Stereo tape recorder.  $\frac{1}{4}$ -track. Speeds: 1 $\frac{7}{8}$ , 3 $\frac{3}{4}$  and 7 $\frac{1}{2}$ i/s. Max spool capacity: 7in W and F: 7 $\frac{1}{2}$ i/s



Heathkit AA-22U stereo amplifier



Heathkit STR-1

0.15%; 3 $\frac{3}{4}$ i/s 0.25%; 1 $\frac{7}{8}$ i/s 0.35%. H and N: 7 $\frac{1}{2}$ i/s 55dB; 3 $\frac{3}{4}$ i/s 47dB; 1 $\frac{7}{8}$ i/s 42dB. FR: 7 $\frac{1}{2}$ i/s 40Hz-18kHz; 3 $\frac{3}{4}$ i/s 40Hz-12kHz; 1 $\frac{7}{8}$ i/s 40Hz-7.5kHz. Replay char: DIN. Level indicator: meter. Rewind time: 1,500ft 1 $\frac{1}{2}$ min. Inputs: mic, 0.35mV, 50K; aux, 50mV, 100K. Outlets: extension speaker, 4W, 8 ohms; external amplifier, 1V, 1K. Audio output: 4W RMS. Speaker size: 8 × 5in. Transistorised. One motor. Tape deck: TD10. Dimensions: 7 $\frac{7}{8}$  × 19 $\frac{1}{2}$  × 15 $\frac{1}{2}$ in. Weight: 30lb. Superimposing. Straight through amplifier. Input mixing. Sound on sound. Common stacked head. Psn 220-250V 50Hz. Price: in kit form £65.

#### Trent

Infinite baffle enclosure with units and crossover. One 8in bass driver, one totally enclosed 4in tweeter. Crossover: 5kHz. FR: 40Hz-16kHz. HC: 10W RMS. Impedance: 8 ohms nominal. Size: 19 × 10 × 8 $\frac{1}{2}$ in. Vertical or horizontal operation. Finish: teak or walnut veneer melamine. Weight: 13lb. Cabinet material: 12mm pressed wood. Price: (kit) £15-20 (carriage extra).

#### Berkeley

Infinite baffle hi-fi enclosure with speakers and cross-overs. One 12in low-resonance bass unit, one 4in middle and top unit. Inductance/capacitance cross-over at 900Hz. Handling

capacity 15W RMS. Kit includes ready finished cabinet shell. Finish: oiled walnut or teak veneer. Size: 26in high, 17in wide, 7½in deep. Price (kit): £23.90. Carriage extra.

**Avon**

Infinite baffle bookcase enclosure with two units. One 6in high compliance bass driver, one 3in tweeter. Fully finished walnut or teak veneered cabinet. Size: 7¼ × 13¼ × 8½in. Price (kit): £15. Carriage extra.

**Ambassador**

Enclosure with three units and crossovers. Infinite baffle. 12in bass driver, 5in enclosed chassis mid-range unit, 1in pressure tweeter. Crossover frequencies: 1kHz and 6kHz. FR: 30Hz-20kHz. HC 20W RMS. Impedance 8 ohms. Size: 28 × 18 × 11½in. Weight: 45lb. Finish: teak or walnut veneers. Lined 12mm Celotex. Ceramic magnet units. Price (kit) £33. Carriage extra.

**C-3U**

Resistance-capacitance bridge. Self-contained and powered. Capacitance range 0.00001 to 1,000 microfarads. Resistance range 100 ohms to 5 megohms. Power factor and leakage also indicated. Polarising voltage available from 5 to 450V. Price (kit): £13.50. Carriage extra.

**AV-3U**

Audio valve millivoltmeter. Measures voltages as low as 1mV to a maximum of 300V at high impedances in 10 ranges. Frequency range 10-400,000Hz. Uses a 4½in meter. Cathode follower output. Price (kit): £22.80. Carriage extra.

**309-CU**

RF probe. Extends the range of a valve voltmeter to 100MHz. Uses a printed circuit board. Price (kit): £3.40. Carriage paid.

**AW-1U**

Audio wattmeter. Uses external loads or the following internal loads: 3, 8, 15 and 600 ohms. 5 power ranges from 0.5mW to 50 watts. 4½in meter calibrated in watts and dB. Price (kit): £24.90. Carriage extra.

**AO-1U ★**

Inexpensive audio generator covering 20Hz-150kHz sine wave, 20Hz-25kHz square wave. Output up to 10V RMS sine wave or 80V peak-to-peak square wave. Size: 9½ × 6½ × 5in. Price (kit): £15.50. Carriage extra.

**IM-58U**

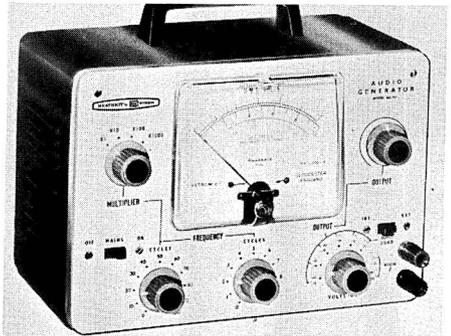
Low-priced audio distortion meter. Simple to use. Measures distortion at frequencies between 20Hz and 20kHz. Size: 13 × 7 × 8½in. Price (kit): £37.50. Carriage extra.

**IG-82U**

Audio generator covering 20Hz-1MHz. Sine



Heathkit AO-1U audio generator



Heathkit AG-9U audio generator

and square wave available simultaneously. Sine wave output up to 10V RMS, square wave output up to 10V peak-to-peak. Rise time 0.15 µSec. Size: 13 × 8½ × 7in. (Price (kit): £27.10. Carriage extra.

**AG-9U ★**

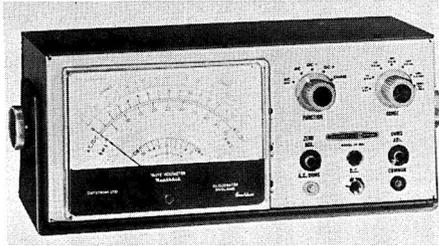
Audio signal generator. Range: 10Hz-100kHz. Distortion less than 0.1% from 20Hz-20kHz. Decade switching over 8 voltage ranges from 3mV-10V monitored. Uses 4½in meter. Price (kit): £29.40. Carriage extra.

**IM-18U**

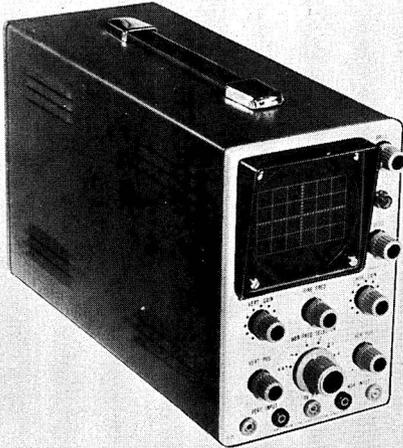
Valve voltmeter kit. Printed circuit. Measures AC volts (0.1-5, 5, 15, 50, 150, 500, 1,500) RMS. AC volts (0.4, 14, 40, 140, 400, 1,400, 4,000) peak-to-peak, DC volts (0.1-5, 5, 15, 50, 150, 500, 1,500). Ohms (with 10 ohms centre) × 1, 10, 100, 1,000, 10K, 100K, 1 megohm, 0.1 ohms to 1,000 megohms with internal battery. Input resistance: 11 megohms. 200 µA meter movement. Price (kit): £17.50. Carriage extra.

**IM-28U**

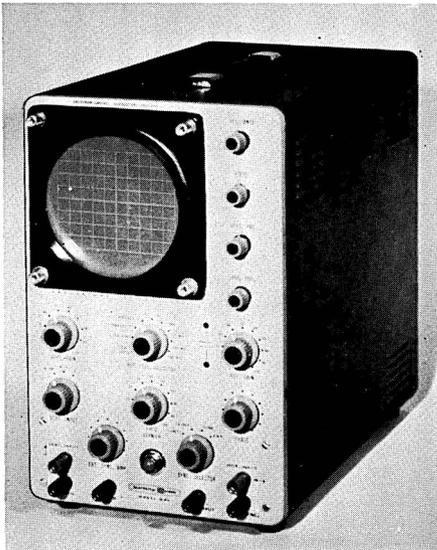
Laboratory valve-voltmeter kit. Printed circuit.



Heathkit IM-28U valve voltmeter



Heathkit OS2 oscilloscope



Heathkit IO-18U oscilloscope

Gimbal mounting, for viewing from any angle. Measures AC volts (0.1-5, 5, 15, 50, 150, 500, 1,500 RMS); AC volts (0.4, 14, 40, 140, 400, 1,400, 4,000 peak-to-peak). DC volts (0.1-5, 5, 15, 50, 150, 500, 1,500). Ohms (with 10 ohms centre)  $\times 1$ ,  $\times 10$ ,  $\times 100$ ,  $\times 1,000$ , 10K, 100K, 1 meohm. 0.1 ohms to 1,000 meohms with internal battery. Input resistance: 11 megohms. 200  $\mu$ A meter movement. Price (kit): £25.50. Carriage extra.

**OS-2 ★**

Service oscilloscope. 2 $\frac{3}{4}$ in tube. Vertical bandwidth 2Hz-3MHz. Automatic lock-in sync. Mu-metal CRT shield. Printed circuit. Switched ext/int Y plate connections. Vertical amplifier: sensitivity 100mV/cm, input impedance: 3.3 megohms shunted by 20pF, response 2Hz-3MHz  $\pm$ dB. Horizontal amplifier: sensitivity 100mV/cm, input impedance: 10 megohms shunted by 20pF, response 2Hz-3MHz. Time base: 20Hz-200kHz in four steps. Size: 5  $\times$  7 $\frac{3}{8}$   $\times$  12in. Weight: 9 $\frac{3}{4}$ lb. Price (kit): £32. Carriage extra.

**IO-18U ★**

General purpose oscilloscope kit. 5in flat face CR tube. Printed circuits. Vertical band-width 3Hz-4.5MHz. Built-in IV calibrator. Y-sensitivity 10mV RMS per cm at 1kHz. X-sensitivity 50mV RMS per cm at 1kHz. Price (kit): £42.80. Carriage extra.

**S-3U**

Electronic switch (oscilloscope trace doubler). Converts a single beam oscilloscope to double beam. Switching rates 150, 500, 1,500, 5,000 and 15,000Hz. Signal frequency response 0-100kHz  $\pm$ dB. Signal input range 0.1-1.8V RMS. Price (kit): £16.30. Carriage extra.

**■ HELME**

P. F. and A. R. Helme Ltd, Summerbridge, Harrogate, HG34DR, Yorks. Tel: Darley 279.

**Range of easy-to-assemble speaker enclosures for the home constructor ★**

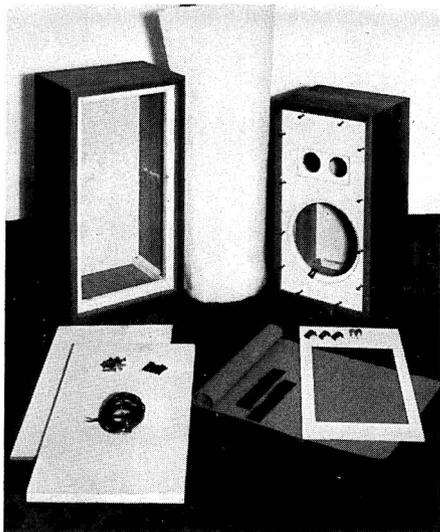
Each kit comprises fully finished and polished outer shell (veneered natural teak), set of terminals, wire, uncut baffle, brown Vynair covering. All nuts, bolts and screws are included, also BAF wadding for inside cabinet.

All cabinets are infinite baffle type. Speaker units are not specified but internal volume of cabinet will provide guide together with speaker unit literature and data.

Helme cabinet kits include:

**Kit 7**

Size: 12  $\times$  8  $\times$  7in. Volume: 7 litres. Price: from £6.25.



Helme Cabinet Kit (speakers)

**Kit 10**

Size: 14 × 9 × 7in. Volume: 10 litres. Price: from £7.

**Kit 16**

Size: 18 × 10 × 9in. Volume: 16 litres. Price: from £9.

**Kit 20**

Size: 20 × 11 × 9in. Volume: 20 litres. Price: from £11-25.

**Kit 25**

Size: 21 × 11 × 10in. Volume: 25 litres. Price: from £12-50.

**Kit 30**

Size: 22½ × 12½ × 10in. Volume: 30 litres. Price: from £12-75.

**Kit 60**

Size: 29 × 21 × 9in. Volume: 62 litres. Price: from £22-75.

■ **HENELEC ELECTRONIC PRODUCTS**

Henry's Radio Ltd, 303, 309, 354, 356, Edgware Road, London, W2. Tel: 01-723 1008.

**PA25 Power Module**

Output: 25W RMS into 8 ohms. Input: 600mV 15K. Power response: -1dB 11Hz-40kHz. FR: 11Hz-100kHz -1dB. Rise time 10kHz: 2½µsecs. HD: 0.3% at 25W RMS at 1kHz. Edge connector. Size: 5 × 3 × 2in. Price: £7-50.

**PA50 Power Module**

Output: 50W RMS into 4 ohms. Inputs: 700mV 15K. Size: 5 × 3 × 4in. All other details as for PA25. Price: £9-50.

**MU422 Mains Unit**

Output sufficient to power two PA25 modules or one PA50 module. Edge connector for direct connection to power amplifiers. Size: 6½ × 3¾ × 5½in. Price: £6.

**FET154 Stereo Preamplifier**

Self-powered. Inputs: mag PU, ceramic PU, aux, radio. Output: Adjustable 0-1V. Push-button input selector. Stabilised power supply. Price: £16-50.

**FET9/4 Mono Preamplifier**

Self-powered. Inputs: ceramic PU, aux, radio, mic (50K dynamic). Mic input has mixing facility. Push-button input selector. Stabilised power supply. Output: 0-1V. Price: £12-50.

**MPA12/3 and MPA12/15**

Power modules. Output: 12W RMS. Input: 100mV 33K. FR: 20Hz-18kHz 3dB. Output impedance: (MPA12/3) 3-4 ohms, (MPA12/15) 12-16 ohms. Power supply: (MPA12/3) 18V 0.8A peak, (MPA12/15) 36V 0.4A peak. Prices: (MPA12/3) £4-50; (MPA12/15) £5-25.

**MU24/40 Power Supply**

Mains supply unit for powering one or two MPA12 amplifier modules. Price: £4-88.

Other products available in kit or ready built form include electronic organs. Full details on request.

■ **KEF ELECTRONICS LTD**

Tovil, Maidstone, Kent.  
Tel: Maidstone 57258. Cables: KEF, Maidstone.

**Keffit 2**

B139 and T15 drive units supplied mounted on 22½ × 13½ × 4in baffle. Complete with grille fabric, mounting bolts, BAF padding, speaker terminals and full mounting instructions. HC: 25W. FR: 35Hz-35kHz. Impedance: 8 ohms. Price: £25.

**Keffit 3**

B139, B110 and T27 units supplied mounted on 28 × 14 × 10½in baffle. Complete with grille fabric, mounting bolts, BAF padding, speaker terminals and full mounting instructions. HC: 30W. FR: 30Hz-30kHz. Impedance: 8 ohms. Price: £36.

■ **MARTIN AUDIOKITS**

Louis & Lewis (Electronics) Ltd, 154-155 High Street, Brentford, Middlesex. Tel: 01-560 1160.

**Unit 1**

Mono input selector. Price: £3-38.

**Unit 1A**

Stereo add-on for Unit 1. Price: £3.

**Unit 1S**

Stereo input selector. Price: £6-25.

★ Indicates entry is illustrated

#### Unit 4

Mono preamplifier with tone controls. Price: £3-75.

#### Unit 4A

Stereo add-on unit for Unit 4. Price: £4-50.

#### Unit 4S

Stereo preamplifier with tone controls. Price: £6-75.

#### Unit 7

10W amplifier with 15 ohm output. Price: £7.

#### Unit 8

Mains power supply for Unit 7 (mono or stereo). Price: £3-50.

#### Unit 9A

Stereo preamplifier for magnetic pickup. Price: £3.

#### Unit 9B

Stereo preamplifier for ceramic pickup. Price: £3.

#### Unit 9S

Comprises Unit 1S and Unit 9A. Price: £9.

#### Unit 10S

Balance control for use with stereo assemblies. Price: 75p.

#### Unit 14

Mono escutcheon. Price: 75p.

#### Unit 14S

Stereo escutcheon. Price: 90p.

#### Unit 1478E

Complete assembly for integrated 10W mono amplifier and control unit. Price: £17-50.

#### Unit 1478SE

Complete assembly for integrated 10W stereo amplifier and control unit. Price: £29-95.

#### Unit 9478SE

Complete assembly for integrated 10W stereo amplifier and control unit with inputs for magnetic-PU's. Price: £32-95.

Full details and specifications of above models on request.

### ■ MULLARD LTD

Mullard House, Torrington Place, London, WC1. Tel: 01-580 6633.

#### Unilex

Four modules—preamplifier, two power amplifiers and one power supply unit—expressly designed for do-it-yourself enthusiasts. Available from radio component shops and audio dealers throughout the UK.

The modules can be interconnected without soldering. No electronic knowledge is required to build up a low-cost stereo amplifier.

An illustrated booklet, *Do-it-yourself stereo*, is also available from audio dealers, price 25p. This

booklet provides all the information the do-it-yourself man (or woman) needs to build a stereo system, complete with cabinets, incorporating Mullard modules.

#### Preamplifier module EP9001

Stereo transistorised preamplifier without controls. Inputs: ceramic PU 320mV 2-2M, radio 140mV 1M. Supply needed: 24V DC. Size:  $4\frac{1}{8} \times 5 \times 1$ in. Designed for use with Amplifier module EP9000. Price: £3-10.

#### Amplifier module EP9000

Transistorised mono amplifier (two required for stereo). Output: 4W. HD: <2%. FR: 50Hz-15kHz  $\pm 3$ dB. Output impedance: 12-15 ohms. Supply needed: 24V DC. Size:  $4 \times 3\frac{7}{8} \times 1$ in. Designed to operate with preamplifier module EP9001. Price: £2-90.

#### ED9002

Power Supply Module £4-60.

### ■ PEERLESS

Distributor: P. F. & A. R. Helme Ltd, Summerbridge, Harrogate, HG34DR, Yorks. Tel: Darley 279.

Peerless speaker kits are of 8 ohms impedance (4 ohms to special order on most kits). A range of crossover networks is available ready wired and assembled on printed circuit boards.

All kits are complete with crossover network or components.

#### 2-8 kit

$6\frac{1}{2}$ in bass and  $2\frac{1}{2}$ in HF units. HC: 10W. FR: 50Hz-18kHz. Crossover: 4kHz. Price: £5-60 (plus £1-11 PT).

#### 2-10 kit

$6\frac{1}{2}$ in bass driver with rubber roll surround,  $2\frac{1}{2}$ in tweeter. Crossover: 2.5kHz. HC: 10W RMS. FR: 45Hz-18kHz. Price: £8-83 (plus £1-42 PT).

#### 3-15 kit

8in bass, 5in mid-range and 2in tweeter. HC: 15W. FR: 45Hz-18kHz. Crossover: 750Hz and 4kHz. Price: £10-50 (plus £2-21 PT).

#### 3-25 kit

12in bass, 5in mid-range and 2in tweeter. HC: 25W. FR: 40Hz-18kHz. Crossover: 750Hz and 4kHz. Price: £16-80 (plus £1-15 PT).

#### 4-30/12 kit (8 ohms only)

12in bass,  $7 \times 5$ in mid-range and two  $2\frac{1}{2}$ in tweeters. HC: 40W. FR: 30Hz-18kHz. Crossover: 500Hz and 3.5kHz. Price: £26-85 (no PT).

#### 50-2

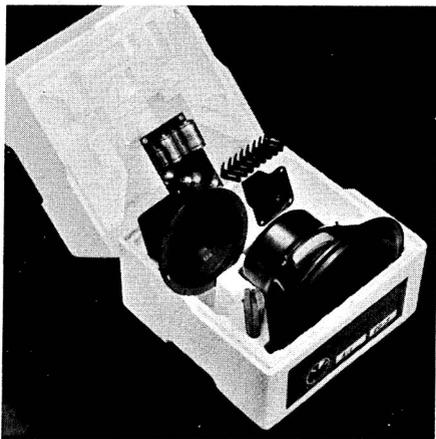
12in bass driver, 4in tweeter. HC: 15W RMS. FR: 45Hz-18kHz. Crossover 4kHz. Price: £9-15 (plus 42p PT).

#### 50-4

12in bass driver,  $7 \times 5$ in mid-range unit, two  $2\frac{1}{2}$ in



Peerless PR 20-2



Peerless PR 20-3

tweeters. HC: 40W. FR: 30Hz-18kHz. Crossover: 500Hz and 3.5kHz. Price: £23 (plus £3.86 PT).

#### PR20-2 ★

Comprises speaker units, crossover, mounting brackets, wiring and instructions to make two-way system. Bass driver L825WG and tweeter MT225HFC. HC: 30W RMS. FR: 40Hz-20kHz. Standard impedances: 4, 8 or 16 ohms. Crossover frequency: 2.5kHz. Price: £12.60.

#### PR20-3 ★

Comprises speaker units, crossover, mounting brackets, wiring and instructions to make three-way system. Bass driver L825WG, mid-range unit G50MRC, tweeter MT225HFC. HC: 40W RMS. FR: 40Hz-20kHz. Standard impedance: 4, 8 or 16 ohms. Crossover frequencies: 15kHz and 6kHz. Price: £18.75.

#### PR315

Comprises speaker units, crossover, mounting brackets, wiring and instructions to make three-way system. Bass driver P825W, mid-range unit GT50MRC, tweeter MT20HFC. HC: 15W RMS. FR: 45Hz-18kHz. Standard impedance: 4, 8 or 16 ohms. Crossover frequencies: 750Hz and 4kHz. Price: £12.71.

#### ■ SINCLAIR RADIONICS LTD

London Road, St Ives, Huntingdonshire, PE174HJ. Tel: St Ives (Hunts) 4311

#### Sinclair Z-30

Transistorised mono amplifier module. Nine silicon transistors. Output: 15W RMS into 8 ohms (35V supply), 20W into 3 ohms (30V supply). FR: 30Hz-300kHz  $\pm$  1dB. HD: 0.02% at full output into 8 ohms and at all lower power levels. SN: better than 70dB. Input: 250mV into 100K. Output impedance: 3-15 ohms. Full instruction manual and circuit diagram supplied with each module. Price: £4.48, (ready built and tested).

#### Sinclair Z-50

Transistorised mono amplifier module. Similar specification to the Z-30 but uses higher power transistors. Output: 40W RMS into 3-4 ohms, 30W RMS into 8 ohms. Price: £5.48.

#### Power supply units

(PZ-5) 30V unregulated. Suitable for two Z30 and Stereo 60. Price: £4.98. (PZ-6) 35V regulated. Suitable for two Z-30 and Stereo 60 when low efficiency speakers used. Price: £7.98. (PZ-8) 45V for use with Z-50 amplifiers (less mains transformer) £7.98; (PZ-8 mains transformer) £5.98.

#### ■ SME LTD

Steyning, Sussex, BN4 3LN. Tel: Steyning 2228.

#### Model 2000

Plinth system parts available separately, as follows:

#### Components

Base in teak, rosewood or walnut. Price: £13.60 (plus £3.33 PT); Motor board in teak, rosewood or walnut. Price: £4.35 (plus £1.06 PT); Acrylic lid. Price: £8.65 (plus £2.11 PT); Spring mounts complete with foam damping blocks (set of four). Price: £4.40 (plus 98p PT); Hinges left hand or right hand). Price: £2.55.

#### Accessories

PI spacer to adjust height when arm is used with deep turntable. Price: 83p (plus 20p PT). Mounting brackets for fitting Thorens TD125 to motor board (PS2000/TD125). Price: £1.25 (plus 31p PT).



Wharfedale Unit 4

#### Mounting boards

For model 3009 on Thorens TD124. Price: £2-88 (plus 70p PT); For model 3012 on Thorens TD124. Price: £3-50 (plus 86p PT); For model 3009 on Thorens TD125. Price: £2-88 (plus 70p PT); For model 3012 on Thorens TD125. Price: £3-50 (plus 86p PT); For model 3009 on Thorens TD150. Price: £2-88 (plus 70p PT); For model 3012 on Thorens TD150. Price: £3-50 (plus 86p PT).

#### ■ VERO

Vero Electronics Ltd, Industrial Estate, Chandler's Ford, Eastleigh, Hants, SO5 3ZR. Tel: Chandler's Ford 2952. Telex: 47551.

Wide range of equipment cases suitable for hi-fi units, tuners, power supplies and test gear. Available in various panel heights and with or without anodised aluminium front handles. Made in light gauge steel finished in RAF blue/grey vinyl paint. Integral aluminium trim. Neat slim-line appearance. Ventilation slots incorporated. Full list of sizes, accessories and prices, available on request. Ask for Vero "D" series cases.

Vero circuit boards comprise resin-bonded paper laminate clad on one side with loz copper foil of nominal thickness 0.062in (1.5mm). Base material cut to width and punched with a matrix of holes. Copper foil is in parallel strips along the lines of holes. Enables small electronic assemblies to be built easily and quickly. Vero boards are produced in various sizes, also double-sided, in strips, with plug-in termina-

tions, edge-connectors, breadboards and in plain non-coppered versions. Accessories include connector contacts, terminal pins, pin insertion tool, spot face cutter and numerous design-aid sheets. Catalogue on request.

#### ■ WHARFEDALE

Rank Wharfedale Ltd, Bradford Road, Idle, Bradford, Yorks. Tel: Bradford 612552.

##### Unit 3 kit

Do-it-yourself hi-fi two-speaker kit comprising 3in tweeter and 8in bass unit. Suitable for output impedance 4-8 ohms. HC 15W RMS. Crossover supplied operates at 1,750Hz. The tweeter has Acoustiprene dome diaphragm. Acoustic wadding, mounting bolts and connecting wire, etc, are included. Price: £10-40 (plus £2-60 PT).

##### Unit 4 kit ★

Two-speaker kit for floor-standing enclosure. Incorporates 12in bass driver and 3in treble unit. Four-element crossover. When assembled into suitable enclosure is equivalent to Wharfedale Melton. Price: £18.

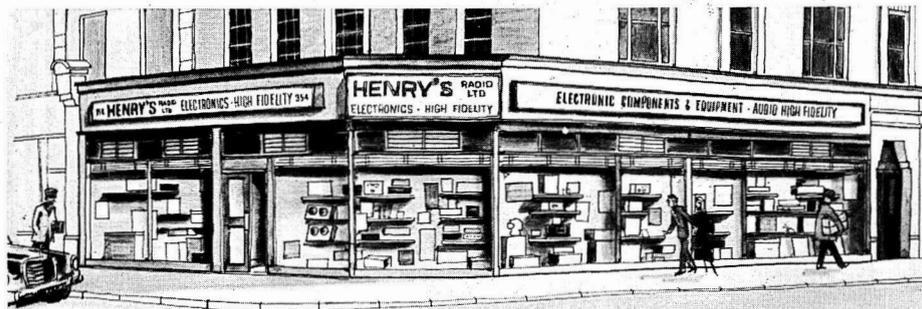
##### Unit 5 kit

Three-speaker kit for floor-standing enclosure. Incorporates 12in bass driver, 5in mid-range unit and 1in tweeter. Six-element crossover network. When assembled into suitable enclosure is equivalent to Wharfedale Dovedale. Price: £26.

Wharfedale kits include speakers, crossover network, acoustic wadding, mounting bolts, connecting wire and full instructions. No expert technical knowledge needed. Cabinets are not included.

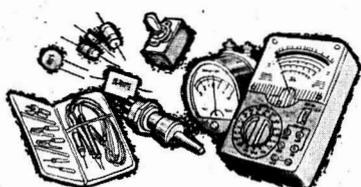
# ENGLAND'S LEADING ELECTRONIC CENTRES

**\* 4 CENTRES!** 354 and 356 OPEN 9am-6pm 6 DAYS A WEEK MONDAY to SATURDAY  
303 CLOSED ALL DAY THURSDAY. 309 HALF DAY THURSDAY.



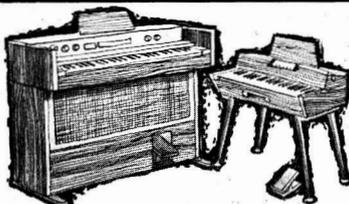
## HENRY'S RADIO LTD

1



356 EDGWARE ROAD, TEL: 01-402 4736  
Electronic Components and Equipment  
Do-it Yourself Shop, Gadgets and Units

2



309 EDGWARE ROAD, TEL: 01-723 6963  
Electronic Organs Musical Instruments  
- Ready built or in Kit form



3



354 EDGWARE ROAD, TEL: 01-402 5854  
High Fidelity Sales and Demonstrations  
Home, Portable & Car Tape Equipment

4



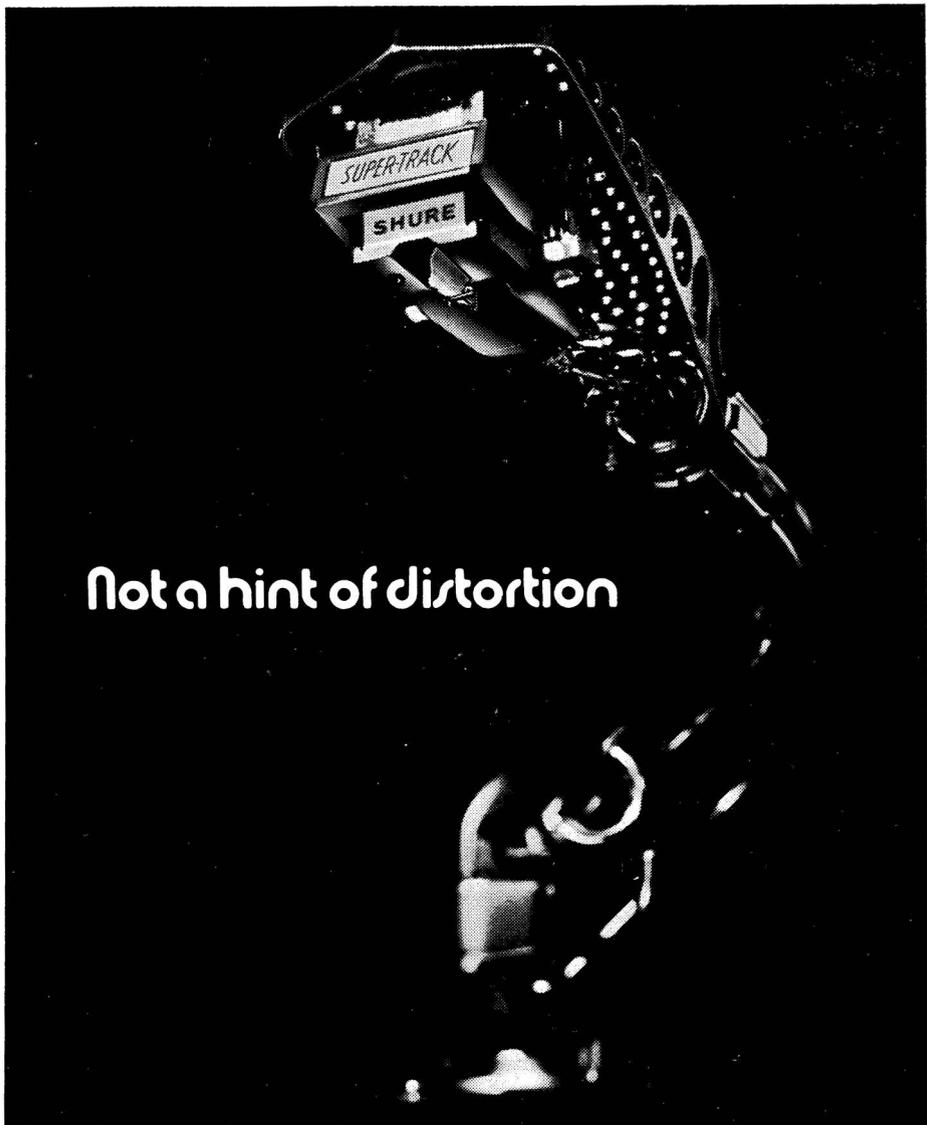
309 EDGWARE ROAD, TEL: 01-723 6963  
Discotheque, Sound and Lighting  
and Public Address Equipment

Mail Order and Sales Depts.  
\*New Bargain Offers shop

303 EDGWARE ROAD, LONDON W2. 1BN  
TEL: 01-723 1008/9

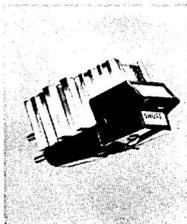
CABLES GRA MS: HENELEG LONDON W.2.  
TELEX: 28116 (TRANSONICS LDN)





Not a hint of distortion

SHURE V-15 Type II  
(Improved) SUPER-TRACK  
with bi-radial elliptical  
stylos (0.0002" x 0.0007")  
- 15° tracking - unique  
"flip-action" built-in stylus guard.



Please send me full information on the  
SHURE V-15 Type II. (Improved)

Name

Address



**SHURE**

Shure Electronics Ltd.  
84 Blackfriars Rd., London SE1. Tel: 01-928 3424

# Directory of Microphones

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ ACOS

Cosmocord Ltd, Eleanor Cross Road,  
Waltham Cross, Herts.  
Tel: Waltham Cross 27331.

### Mic 70/12

Omni-directional moving coil. FR: 80Hz-12 kHz (10dB down at 50Hz and 15kHz). Impedance: 200 ohms. Rec. load: 200 ohms-10K. Sensitivity: -80dB re 1V/ $\mu$ b. Price: £7.50.

### Mic 70/11

Omni-directional moving coil. FR: as for Mic 70/12. Impedance: 50K nominal. Sensitivity: -57dB re 1V/ $\mu$ b. Price: £8.40.

## ■ ADASTRA ELECTRONICS LTD

Unit 22, Cricklewood Trading Estate,  
Claremont Road, London, NW2 1TU  
Tel: 01-452 6288 (answering service 01-452 6289).

### Imp-Verta ★

Matches low impedance microphones, PU cartridges and tape heads into high impedance amplifier inputs. Solid state printed circuit device using silicon transistor. Automatically switched internal 9V battery. Negligible drain. Conversion factor approximately 20 (depending on load). Virtually no hum or signal loss. Metal case, black crackle finish. Size:  $5 \times 1\frac{1}{2} \times 1\frac{1}{2}$  in. Price: £3.50.

## ■ AKAI

Rank Audio Products, PO Box 70, Great West Road, Brentford, Middlesex.  
Tel: 01-568 9222. Telex: 24408.

### UM101 ★

Mono ceramic microphone. Uni-directional response. FR: 100Hz-10kHz +5dB -8dB. Sensitivity: -60dB  $\pm$  3dB. Impedance: 5K at 1kHz. Stand microphone, complete with desk stand. Finish: chrome. Price: £10.50.

## ■ A.K.G.

Distributors: A.K.G. Equipment Ltd,  
182/184 Campden Hill Road, Kensington,  
London, W8. Tel: 01-229 3695.

## C12A ★

Professional condenser microphone. Variable polar diagram covering cardioid, omni, figure-of-eight and six intermediate positions. FR: 10 Hz-20kHz. Sensitivity: -68dB. Impedance 50 and 200 ohms. Rec load >150 and 500 ohms. Fitting:  $\frac{3}{8}$  in whit,  $\frac{1}{2}$  in 26tpi,  $\frac{5}{8}$  in 27tpi. Metal case finished matt silver. Price: £150.

## C24 ★

Stereo condenser. Sensitivity 1mV/bar. Imp 200 or 500 ohms. Response 30Hz-20kHz. Omni-directional cardioid; bi-directional, hyper-cardioid. Plus 5 intermediate patterns. Sensitivity approx 1mV per microbar (at 200 ohms output terminals) -33dB re 1 milliwatt at a sound pressure of 10 dynes/cm<sup>2</sup>. Crosstalk between channels <40dB throughout entire range. Imp <200 ohms when delivered. 50 ohms by changing solder connections. N.24 power supply unit. Remote control unit. Twin remote control cable. Price: £290.

## C451

FET condenser microphone with cardioid, sharp cardioid or omni-directional capsule. FR: 20Hz-20kHz. Prices: microphone, preamplifier and one capsule £48; mains power unit with outputs for four microphones £56 nett; battery power unit £17.

## D11D-HL ★

Moving coil cardioid microphone. Incorporates adaptor to change polar response from cardioid to super- and hyper-cardioid. FR: 80Hz-15kHz. Front-to-back ratio: 16dB. Impedance: 500 ohms or 50K. Sensitivity: 72.5dB at 500 ohms, 54dB at 50K. Price: £10.

## D12

Moving coil with cardioid directional pattern. Response 40Hz-12kHz  $\pm$  4dB. Front to back ratio 15dB. Sensitivity: -77dB. Imp 60 ohms, or to order. Price: £33.

## D14

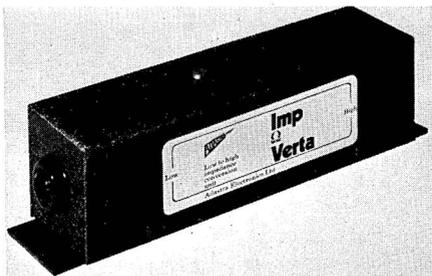
Dynamic cardioid microphone. Imp 60-40,000 ohms. Response 50Hz-15kHz. On/off switch. Swivel joint fits all stand threads. Supplied with  $5\frac{1}{2}$  yds two-core screened lead. Weight: 8oz. Price: £13.

## D58

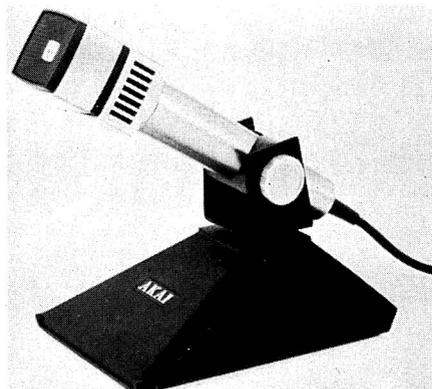
Moving coil, close-talk microphone. Response 50Hz-12kHz. Sensitivity: 0.1mV/ $\mu$ bar. Imp 60 or 200 ohms. Price: £13.50.

## D109 ★

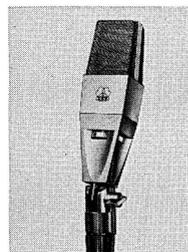
Omni-directional moving coil. FR: 50Hz-15kHz  $\pm$  3.5dB. Sensitivity: -98dB. Impedance: 60 and 200 ohms. Recload  $\geq$  400 ohms. Hand and lavalier type. Supplied with lavalier cord. Higher frequencies boosted when lavalier attached. Metal case nickel plated. Price: £13.



Adastra IMP-VERTA



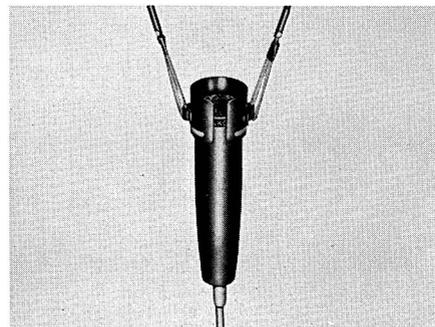
Akai UM101



AKG C12A



AKG C24



AKG D109

**D190**

Uni-directional moving coil microphone. Robust construction. FR: 30Hz-16kHz. Ideal for sound recording and public address systems. Complete with Cannon XLR 3-11C connector. Prices: low impedance (60 or 200 ohms) £21-50; high impedance £22-50.

**D200C**

Two-system cardioid microphone. Incorporates two moving coils, one covering the low and the other the high frequencies. FR: 40Hz-16kHz. Sensitivity: 0-16mV/microbar. Imp 200 ohms. Price: £30.

**D.202E1**

Similar specification to D-202ES except it is supplied without on/off switch and has three-position bass attenuation step switch (0, -7dB and -20dB) instead of potentiometer. Individually calibrated frequency response curve supplied with each microphone. Price: £40.

**D202ES**

Moving coil microphone with marked cardioid response (-20dB minimum). FR: 30Hz-15kHz ±2dB. Sensitivity: -53dB. Impedance 200 ohms. Rec load ≥400 ohms. Stand fitting swivel adaptor, 3/8 in Whit, 1/2 in 26tpi, 5/8 in 27tpi. On-off switch and variable bass control providing 0 to -20dB at 50Hz. Strong black metal case with sintered bronze grille. Price: £37-50.

**D224 ★**

Mono moving coil. Sensitivity: -78dB re 1V/μb. Cardioid response. FR: 20Hz-20kHz ±2dB. Impedance: 200 ohms. Rec load: 500 ohms or more. Fitting: 3/8 in Whit, 1/2 in 26tpi, 5/8 in 27tpi. Features bass cut switch. Finish: metal satin silver. Price: £58 (DIN connector); £58 (Cannon).

**D501**

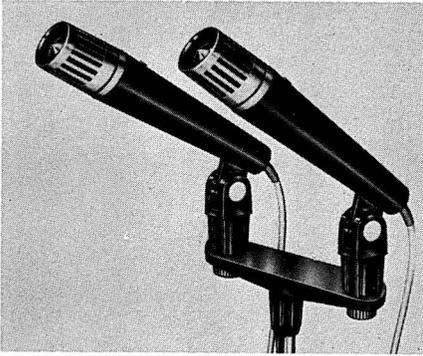
Moving coil cardioid and omni-directional model. FR: 50Hz-15kHz ±3-5dB. Sensitivity: -73dB. Impedance 60 or 200 ohms. Rec load: ≥400 ohms. Hand or stand type. Fitting: 3/8 in Whit, 1/2 in 26tpi, 5/8 in 27tpi. Omni/cardioid switch. Remote control switch. Built-in windshield. Quick release adaptor. Leatherette carrying bag. Moulded case with metal grille. Price: £15-75.

**D707 ★**

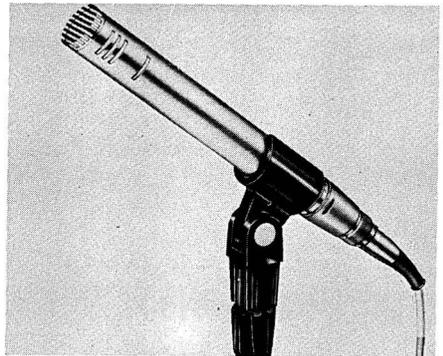
Mono moving coil. Sensitivity: -74dB re 1V/μb. Cardioid response. FR: 80Hz-16kHz ±3-5 dB. Impedance: 200 ohms. Rec load: 400 ohms or more. Fitting: 3/8 in Whit, 1/2 in 26tpi, 5/8 in 27tpi. Finish: metal satin silver. Price: £14 (DIN connector); £17-50 (Cannon).

**D.1000 ★**

Moving coil cardioid microphone with three-position switch giving three different sounds. Developed especially for electronic musicians where feedback is important. Impedance 60- or



AKG D11D



AKG D224CS



AKG D707



AKG D1000C

200 ohms. FR: position 1, 40Hz-16kHz; position 2, 70Hz-16kHz; position 3, 100Hz-16kHz. Front-to-back ratio: 20dB. Sensitivity: -78dB at 60 ohms, -72dB at 200 ohms. Various finishes offered including studio grey and 24 carat gold. For high impedance inputs a lead with line transformer is available. Sensitivity at high impedance: -50dB. Price: from £34 according to requirements.

#### ST200

Microphone floor stand. Telescopic. Height: 42 to 77in. Three collapsible feet with main support locking device. Anti-vibration characteristics. Microphone may be clamped to face any direction. Price: £20.

#### ■ ALTEC LANSING

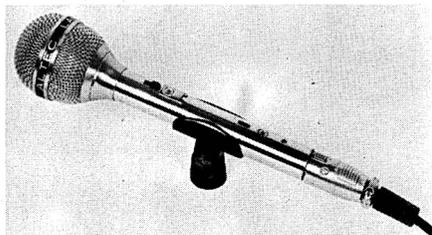
Distributors: Ling Dynamic Systems Ltd, Baldock Road, Royston, Herts. SG8 5BQ. Tel: Royston 42424. Telex: 81174.

#### B650 ★

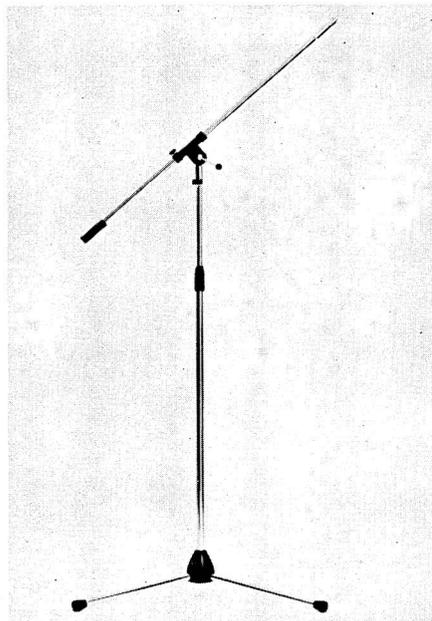
Hand or stand moving coil microphone. Cardioid response. FR: 50Hz-15kHz. Impedance: 150/250 ohms. Sensitivity: -56dBm/10 dynes/cm<sup>2</sup>. 20dB front-to-back discrimination. Mylar diaphragm. Two-position locking type on-off switch. Two-position slide switch provides bass roll-off from 400Hz down. Size: 7½in long, 1½in diameter. Finish: satin chrome. Various accessories and mounting attachments available. Model 650BH includes 25ft screened lead with XLR connector and transformer giving output impedance of 20K. Model 650BL includes 25ft screened lead and XLR connector only. Prices: 650BH £34; 650BL £33.

#### ■ BANG & OLUFSEN UK LTD

Eastbrook Road, Gloucester, GL47DE. Tel: Gloucester 21591.



Altec Lansing 650



Bang & Olufsen floor stand and boom arm

#### **BM5**

Stereo microphone comprising BM6 and BM7. FR: 30Hz-13kHz  $\pm 2$ dB. Imp 180 ohms per channel. Price: £38-50 in presentation case with desk stand and lead.

#### **Beomic 1000**

Moving coil omni-directional. FR: 50Hz-17kHz (+2dB -5dB). Sensitivity 80dB below 1V/ $\mu$ bar. Imp 200 ohms. Hand type with removable table stand. Taper fitting for B & O floor stand and boom arm. Supplied with transparent or black container and anti-microphonic table stand. Satin chrome. Price: £10-50.

#### **Beomic 2000**

Moving coil cardioid. FR: 50Hz-15kHz. Sensitivity: -80dB. Impedance: 200 ohms. Rec load: 200 ohms. Hand microphone with foldaway legs and threaded socket for stand. Continental thread. Price to be announced.

#### **Table Stand**

Tripod stand to fit B and O microphones. Price: £1-50.

#### **Floor Stand ★**

Stable floor stand for B and O microphones. Black and chrome. Price £9-25.

#### **Boom Arm ★**

Adjustable boom arm to match floor stand above. Price: £6.

#### **6001**

Microphone line transformer. Five-pin DIN socket at one end, three-pin DIN plug at the other. Plugs into tape recorders with high impedance input (50K). Fully screened. £3-50.

#### **BEYER**

Beyer Dynamic (GB) Ltd, 1 Clair Road, Haywards Heath, Sussex.  
Tel: Haywards Heath 51003.

#### **M55HL**

Mono moving coil omnidirectional. FR: 70Hz-16kHz  $\pm 4$ dB. Sensitivity: (low Z) 0.17mV; (high Z) 1.5mV. Impedance: (low Z) 500 ohms; (high Z) 50K. Rec load: (low Z) 2K; (high Z) 200K. Hand mic with plastic table stand and clamp. Polished metal finish. Price: £10-35.

#### **M57**

Mono moving coil omni-directional. FR: 300Hz-14kHz  $\pm 3$ dB. Sensitivity: 0.2mV/ $\mu$ bar. Impedance: 200 ohms. Rec load: 1K Hand mic with cable. Steel case. Price: £13-65.

#### **M64**

Mono moving coil cardioid. FR: 100Hz-10kHz  $\pm 3$ dB. Sensitivity: 0.2mV/ $\mu$ bar. Impedance: 200 or 37.5 ohms. Rec load: 1K. Stand mic with gooseneck and baseplate. Grey plastic case. Price: £11-60.

#### **M67N ★**

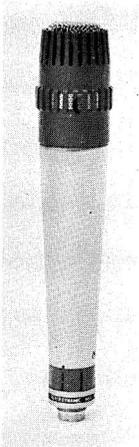
Mono moving coil cardioid. FR: 40Hz-18kHz  $\pm 2.5$ dB. Sensitivity: 0.25mV/ $\mu$ bar. Impedance: 37.5 or 500 ohms. Rec load: 1K. Rubber suspended hand mic. Brushed aluminium finish. Suitable for any climatic conditions. Built-in speech/music switch. Price: (M67N) £32-65; (M67N-C) £34-05.

#### **M68**

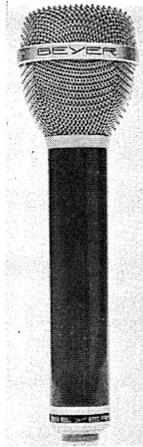
Mono moving coil cardioid. FR: 100Hz-10kHz  $\pm 3$ dB. Sensitivity: 0.2mV/ $\mu$ bar. Impedance: 37.5 or 200 ohms. Rec load: 1K. Fitted with gooseneck and built-in switch. Grey plastic finish. Price: £17-80.

#### **M69 ★**

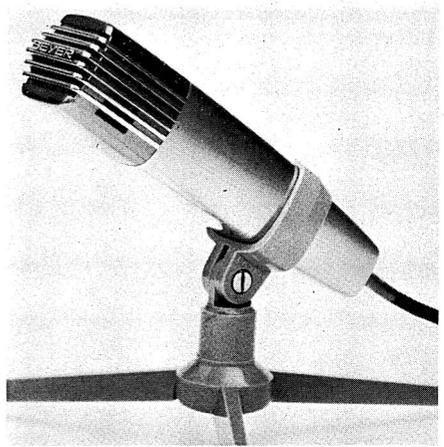
Mono moving coil uni-directional cardioid. FR: 50Hz-16kHz  $\pm 3$ dB. Sensitivity: 0.24mV/ $\mu$ bar. Impedance: 37.5 or 200 ohms. Rec load: 1K. Hand mic with optional speech-off-music switch. Steel case finished blue stove enamel. Price: (M69) £26-35; (M69SM) £29-30.



Beyer M67N



Beyer M69



Beyer M81HL



Beyer Soundstar XI

**M81HL ★**

Mono moving coil cardioid. FR: 50Hz-16kHz  $\pm 3$ dB. Sensitivity: (low Z) 0.23mV/ $\mu$ bar; (high Z) 1.7mV/ $\mu$ bar. Impedance: (low Z) 500 ohms; (high Z) 25K. Rec load: (low Z) 2K; (high Z) 100K. Hand mic supplied complete with plated table stand and clamp. Polished metal finish. Price: £13.35.

**M88**

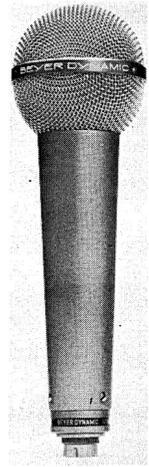
Mono moving coil hypercardioid. FR: 30Hz-20kHz  $\pm 2.5$ dB. Sensitivity: 0.25mV/ $\mu$ bar. Impedance: 200 ohms. Rec load: 1K. Hand mic available with cannon plug. Satin chrome case. Price: (M88) £63.95; (M88-C) £65.70.

**M101**

Mono moving coil omni-directional. FR: 40Hz-20kHz  $\pm 2.5$ dB. Sensitivity: 0.13mV/ $\mu$ bar. Im-



Beyer M260



Beyer M500

pedance: 200 ohms. Rec load: 1K. Hand mic with windshield. Anodised aluminium case. Price: (M101) £31.65; (M101-C) £32.50.

**M111N**

Mono moving coil omni-directional. FR: 60Hz-15kHz. Sensitivity: 0.08mV/ $\mu$ bar. Impedance: 200 ohms. Rec load: 1K. Lavalier mic. Anodised aluminium case. Price: £41.15.

**M160**

Mono double-ribbon super cardioid. FR: 40Hz-18kHz  $\pm 2.5$ dB. Sensitivity: 0.1mV/ $\mu$ bar. Impedance: 37.5 or 200 ohms. Rec load: 1K. Hand mic. Satin chrome steel case. Price: £69.95.

**M260 ★**

Mono ribbon super cardioid. FR: 50Hz-18kHz  $\pm 3$ dB. Sensitivity: 0.09mV/ $\mu$ bar. Impedance:

★ Indicates entry is illustrated

37.5 or 200 ohms. Hand mic. Steel case stove enamelled blue. Price: £27.95.

#### M320

Mono ribbon super cardioid. FR: 3Hz-18kHz  $\pm 3$ dB. Sensitivity: 0.1mV/ $\mu$ bar. Impedance: 200 ohms. Rec load: 1K. Stand mic with three-position music-off-speech switch. Grey plastic case. Price: £33.45.

#### M360

Mono ribbon cardioid. FR: 30Hz-20kHz  $\pm 2.5$  dB. Sensitivity: 0.14mV/ $\mu$ bar. Impedance: 200 ohms switchable to 50 ohms. Rec load: 1K. Stand microphone for studio use. Completely hand made. Supplied with lead. Metal case stove enamelled grey. Price: £91.45.

#### M410

Mono moving coil cardioid. FR: 300Hz-12kHz  $\pm 3$ dB. Sensitivity: 0.25mV/ $\mu$ bar. Impedance: 200 ohms. Rec load: 1K. Hand mic designed for heavy duty use. Black plasticised steel case. Price: £20.95.

#### M411N

Mono moving coil uni-directional cardioid. FR: 200Hz-12kHz. Sensitivity: 0.14mV/ $\mu$ bar. Impedance: 200 ohms. Rec load: 1K. Hand mic with built-in switch. Designed for close-talking applications. Anodised aluminium finish. Price: £25.65.

#### M500 ★

Mono ribbon hypercardioid. FR: 40Hz-18kHz. Sensitivity: 0.13mV/ $\mu$ bar. Impedance: 500 ohms. Rec load: 1K. Hand mic. Anodised aluminium finish. Price: (M500) £37.75; (M500N-T) and (M500N-C) £38.75.

#### M610

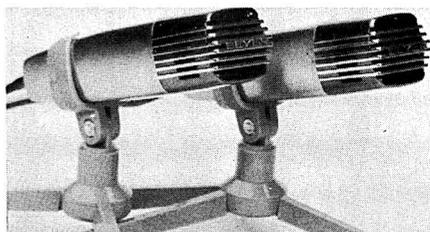
Mono moving coil uni-directional. FR: 50Hz-16kHz  $\pm 3$ dB. Sensitivity: 0.2mV/ $\mu$ bar. Impedance: 37.5 or 200 ohms. Rec load: 1K. Hand mic with optional speech-off-music switch (SM version). Steel case blue stove enamelled. Price: (M610N) £23.25; (M610SM) £25.60.

#### M818HL ★

Stereo moving coil cardioid. Comprises pair of matched M81HL. FR: 50Hz-16kHz  $\pm 3$ dB. Sensitivity: (low Z) 0.17mV/ $\mu$ bar; (high Z) 1.5mV/ $\mu$ bar. Impedance: (low Z) 500 ohms; (high Z) 25K. Rec load: (low Z) 2K; (high Z) 25K. Polished metal case. Price: £28.85.

#### Soundstar XI ★

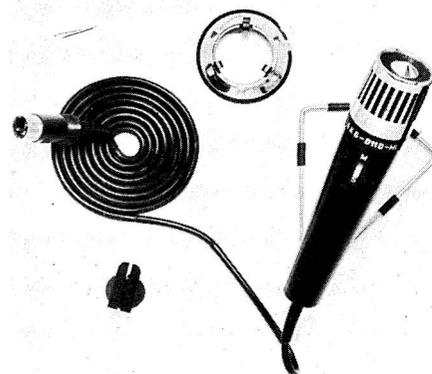
Mono moving coil cardioid. FR: 30Hz-18kHz  $\pm 2.5$ dB. Sensitivity: 0.2mV/ $\mu$ bar. Impedance: (XIN) 200 ohms; (XIHLM) 200, 500 or 25K switchable. Rec load: (XIN) 1K; (XIHLM) 1K, 2K, 100K. Stand mic with built-in pop filter and hum compensation. Cannon plug. Moulded case. Price: (XIN-T) £23.65; (XIN-C) £23.65; (XIHLM) £27.30; (XIHLM-C) £27.85; (XIN) £22.80.



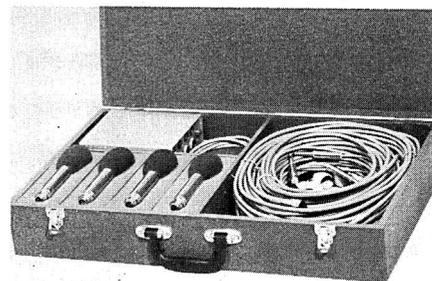
Beyer M818HL



Bouyer 709 cardioid moving coil



British Radio Corporation TA24



Calrec 600 Series capacitor microphones

**BOUYER**

Distributors: Douglas A. Lyons and Associates Ltd, 8 Rycotes Mead, Dulwich, London, SE21. Tel: 01-693 2855.

**709 ★**

Moving coil microphone with marked cardioid response. Rear to front attenuation 20dB. FR: 150Hz-14kHz  $\pm$  3dB. Sensitivity: -63dB reference 1V/dyne/cm<sup>2</sup>. Impedance 20 ohms. Rec load 20-150 ohms. Robust construction. Stand fitting with flexible stem. Hand grip available. Price: (cardioid head) £12.50. Fittings extra as required.

**710**

Similar to 709 but with extended bass response and super cardioid response pattern. Suitable for close-talking applications. Impedance 200 ohms. Price: (cardioid head) £25.50. Fittings extra as required.

**BRITISH RADIO CORPORATION LTD**

Thorn House, Upper St Martin's Lane, London, WC2. Tel: 01-836 2444.

**TA20/TA24 Cardioid microphone ★**

Dynamic microphones with variable cardioid characteristics. Switch positions for optimum results on speech and music. Supplied complete with desk stand and tripod adaptor. Low impedance version TA/24. High impedance version TA/20. Price: £8.63.

**CALREC**

Calder Recordings Ltd, Regent Street, Hebden Bridge, Yorkshire. Tel: Hebden Bridge 2159.

Distributors for South of England, Scotland and overseas: Beyer Dynamic (GB) Ltd, 1 Clair Road, Haywards Heath, Sussex.

**CM600 ★**

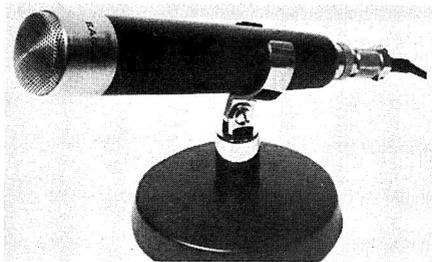
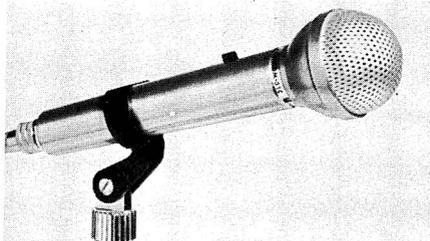
General purpose condenser microphone. Omni-directional. FR: 20Hz-20kHz.  $\pm$  2dB. Output: 1.5mV/microbar. Impedance: 50 ohms (un-balanced). Rec load: 30-50K ohms (adjustment on mic). Slim hand or stand mic. Robust encapsulated FET amplifier. Optional windshield. Three-pin DIN lock-ring connectors. Two-year guarantee. Price: £29.70.

**CM652**

Mono condenser microphone. Cardioid response. FR: 40Hz-20kHz  $\pm$  2dB (related to standard curve). Sensitivity: -56.5dB. Source impedance: 100 ohms. Rec load: adjustable 30 ohms to 50K. Hand type.  $\frac{3}{8}$ " in whit clip supplied. Satin chrome finish. Price: £34.95.

**CM654**

Condenser microphone with cardioid pattern and reduced bass response for close-talking

*Eagle DM18HL**Eagle DM31C*

applications. Other details as for CM600. Price: £34.95.

**CM1001**

Studio condenser microphone. Omni-directional. FR: 20Hz-20kHz  $\pm$  2dB. Output: 0.3 mV/microbar. Impedance: 50ohms. Rec load: 200 ohms (30 ohms when used with lead CL1081). Slim hand or stand mic. Cannon XLR connectors. Robust encapsulated FET amplifier. Two year guarantee. Windshield enclosed in body tube. Price: £58.45.

**CM1050**

Studio cardioid microphone with accurate directional pattern. Other details as for CM1001, except needs external windshield. Price: £58.45.

Wide range of accessories including battery power units, mains power units, connecting leads, windshields, jacks, plugs, adaptors, presentation boxes, twin screened cables, etc. Full details and price list on request.

**EAGLE INTERNATIONAL**

Heather Park Drive, Wembley, HAI 1SU.

Tel: 01-903 0144.

**DM16HL**

Mono moving coil. Omni-directional. FR: 40 Hz-15kHz  $\pm$  3dB. Sensitivity: -62dB. Impedance: 500 ohms and 50K. Stand mic. Fitting: 15.5 x 1mm thread. Built-in impedance switch. Finish: satinised alloy. Price: £6.80.

**DM18HL ★**

Mono moving coil. Omni-directional. FR: 60 Hz-12kHz  $\pm$  3dB. Sensitivity: -57dB. Impe-

★ Indicates entry is illustrated

dance: 600 ohms and 50K. Built-in impedance switch. Rec load: 600 ohms and 50K. Stick mic for hand or stand. Fitting: 15.5 × 1mm thread. Complete with desk stand. Finish: black anodised aluminium. Price: £7.90.

#### **DM31C ★**

Mono moving coil. Cardioid. FR: 40Hz-13kHz. Sensitivity: -52dB. Impedance: 50K. Rec load: 50K. Stick mic for hand or stand. Fitting: 15.5 × 1mm thread. Built-in on/off switch. Finish: satinised stainless steel. Price: £7.90.

#### **DM34C ★**

Mono moving coil. Cardioid. FR: 50Hz-13kHz ± 3dB. Sensitivity: -55dB. Impedance: 50K. Rec load: 50K. Stick mic for hand or stand. Fitting: 15.5 × 1mm thread. Built-in on/off switch. Finish: satinised stainless steel. Price: £6.80.

#### **DM58HL ★**

Mono moving coil. Cardioid. FR: 35Hz-15kHz ± 3dB. Sensitivity: -68dB. Impedance: 200 ohms and 50K. Rec load: 200 ohms and 50K. Stand mic. Fitting: 15.5 × 1mm thread. On/off switch. Anti-pop and boom mesh cover. Finish: satinised stainless steel. Price: £10.60.

#### **UD50HL**

Mono moving coil. Cardioid. FR: 40Hz-14kHz ± 3dB. Sensitivity: -62dB. Impedance: 600 ohms and 50K. Hand and stand mic. Fitting: 15.5 × 1mm thread. Built-in on/off switch. Finish: satinised stainless steel. Price: £8.40.

#### **CO92 ★**

Mono omni-directional condenser. FR: 30Hz-16kHz. Impedance: 600 ohms. Sensitivity: 75dB. Powered by single cell and incorporating built-in low-noise preamplifier. Supplied with 6 metres of screened cable and detachable windshield. Price: £11.50.

#### **CO96**

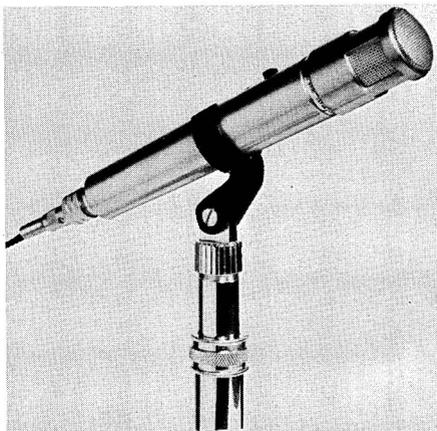
Mono condenser. Similar specification to CO92 but with better than 20dB cardioid response. Impedance: 600 ohms. FR: 30Hz-16kHz. Sensitivity: 70dB. Price: £14.

#### **UD52S ★**

Stereo microphone system using two matched uni-directional units. FR: 100Hz-12kHz. Impedance: 10K (matching into 10K to 50K). Average output: 2.8mV. Each microphone supplied with heavy desk stand, on/off switch, clamps and 3 metres of cable. Price: £12.50.

#### **UD76HL**

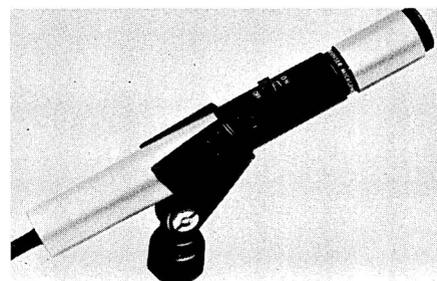
Dual impedance dynamic microphone. Cardioid response. FR: 25Hz-20kHz. Impedance: 600 ohms and 50K. Sensitivity: 56dB at 50K, 76dB at 600 ohms. Fitted with music/speech contour control and switched transformer. Cord length: 9 metres. Supplied with carrying case. Price: £19.50.



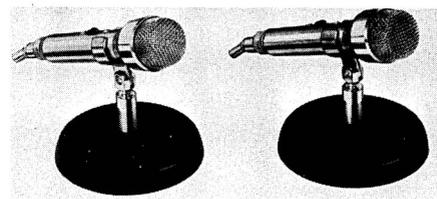
*Eagle DM34C*



*Eagle DM58HL*



*Eagle CO92*



*Eagle UD52S*

## ■ FILM INDUSTRIES LTD

Station Avenue, Kew Gardens, Surrey.

Tel: 01-940 8078.

### M8 ★

Ribbon. FR: 50Hz-13kHz. Figure-of-eight polar diagram. Available matched to all impedances up to 57K. Plug and socket joint between microphone head and flexible. Fitted with 12ft screened cable, other lengths to order. Table, desk and floor stands available. With or without on-off switch. Prices on request.

### M8A

Ribbon. Similar unit to M8 but without plug and socket connection between head and flexible. Small detachable desk stand provided. Other stands available. Available in all impedances up to 57K. With or without on-off switch. Prices on request.

### M8S ★

Ribbon. Similar unit to M8 but with angled base in place of flexible. Small detachable desk stand provided. Other stands are available. Available in all impedances up to 57K. With or without on-off switch. Prices on request.

### Microphone stands

Desk, table and floor stands. Grey hammer finish with cast iron bases. Stems in satin chrome. Prices from £1-50.

### Matching transformer

In mu-metal screened case for fitting into microphone lead. Impedance ratio: 30 ohms to 60K. Price on request.

### Microphone switch assembly

Suitable for use with all microphones. Prices on request.

## ■ GRAMPIAN REPRODUCERS LTD

Hanworth Trading Estate, Feltham, Middx.

Tel: 01-894 9141. Cables: Reamp, Feltham.

### DP4/H

Moving coil. FR: 50-15,000Hz. Sensitivity: -52 dB, -70dB, -86dB, for high, medium and low impedance. 50,000, 600 and 25 ohms. Tubular case. Price including lead: high or medium impedance: £12-15; low impedance £10-25.

### DP6 ★

Moving coil. Omni-directional. FR: 200Hz-15 kHz. Sensitivity: -87dB (25 ohms), -75dB (200 ohms), -50dB (600 ohms), -52dB (50K). Built-in transformer fitted to all but low impedance model. Price: (low impedance) £10-25; (other three models) £12-15.

### GC2 and GC3 ★

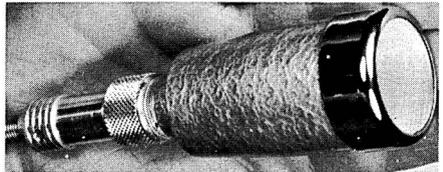
Mono moving coil microphone for hand (GC2) or desk mounting (GC3). Uni-directional response. FR: 70Hz-14kHz. Impedance: (L) 25 ohms; (X) 200 ohms; (M) 600 ohms; (H) 50K.



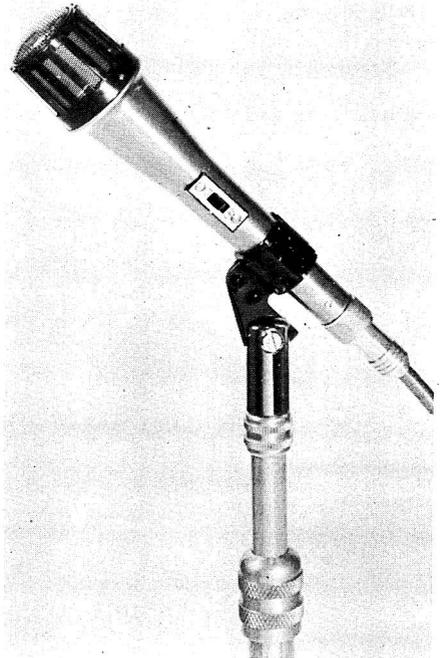
Film industries M8S ribbon on S.6 desk stand



Film industries M8 ribbon on S.6 desk stand



Grampian DP6



Grampian GC2

★ Indicates entry is illustrated

Sensitivity: (L) -86dB 50 $\mu$ V, (X) -75dB 180  $\mu$ V, (M) -70dB 300 $\mu$ V, (H) -52dB 2.5mV. All sensitivity figures per microbar. Easily replaceable diaphragm and coil assembly. GC2 has on-off switch and is supplied with swivel holder for fitting to floor or table stand. Prices: (GC2/L) £18.50; (GC2/X, GC2/M, GC2/H) £20.40; (GC3/L) £15.75; (GC3/X, GC3/M, GC3/H) £17.65.

#### GR1

Ribbon. Unequal figure-of-eight. Response 40 Hz-15kHz. Sensitivity: -90dB (25 ohms), -81 dB (200 ohms), -76dB (600 ohms), -58dB (50K). Imp 25, 200, 600 ohms, 50K. Built-in transformer. Easily replaceable ribbon. Price: £13.25; (in padded instrument case) £15.75.

#### GR2 ★

Details as for GR1, but equal figure-of-eight response.

#### GC1 series

Moving coil cardioid microphones. FR: 40Hz-12kHz  $\pm$  5dB. Metallic diaphragms. Interchangeable leads. Various stands and accessories. Imp GC1/L 25 ohms, rec load 15-50 ohms; GC1/X 200 ohms, rec load 150-300 ohms; GC1/M 600 ohms, rec load 500-1,000 ohms; GC1/50K, rec load 50K and upwards. Sensitivities: GC1/L -86dB, GC1/X -75dB, GC1/M -70dB, GC1/H -52dB. Prices: GC1/L £15.75; GC1/X, GC1/M, GC1/H £17.65.

#### DP8 series ★

Moving coil omni-directional microphones. FR: 50Hz-15kHz  $\pm$  5dB. Built-in on/off switch. Interchangeable leads. Hand type with swivel holder for stand use. Sensitivities, impedances and rec loads as for DP4 series. Prices: DP8/L £12.15; DP8/X, DP8/M, DP8/H £15.05.

#### Boom arm ★

Suitable for use with various types of mics and stands. The clamp, locked by a single lever, allows the reach and angle to be readily adjusted as required. Length: 34in. Weight: 1 $\frac{1}{2}$ lb. Thread termination for mic  $\frac{1}{8}$ in BSF male, thread termination for stand  $\frac{3}{8}$ in  $\times$  27tpi female. Supplied with adaptor to  $\frac{1}{8}$ in BSF female. Adaptors for other sizes available. Price: £6.75.

#### Windshields

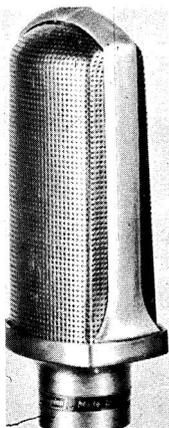
For use with DP4, DP6 and DP8 mics. Pressure moulded cage with an inner lining and acoustic resistance network to reduce air turbulence to a low value. Size: 2 $\frac{3}{4}$ in diameter. Weight:  $\frac{3}{4}$ oz. Price: £1.05.

### ■ GRUNDIG (Great Britain) LTD

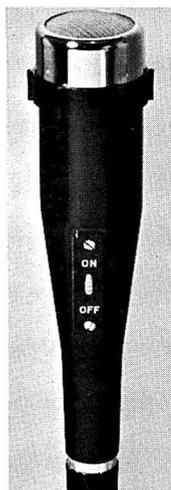
Newlands Park, Sydenham, London, SE26.  
Tel: 01-778 2211.

#### GDM317 ★

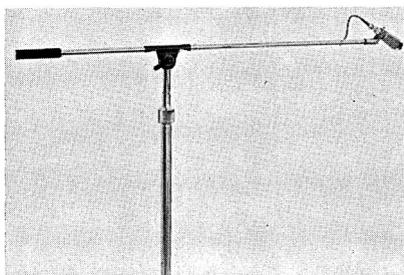
High quality directional moving coil micro-



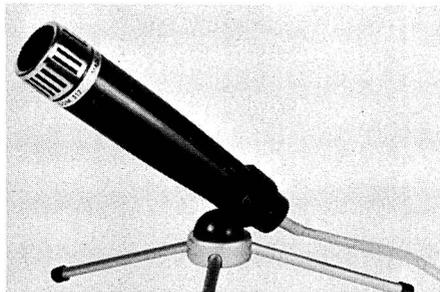
Grampian GR2 ribbon



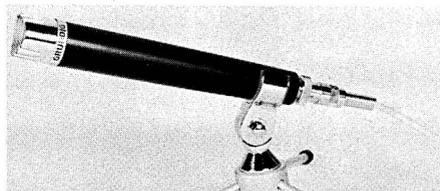
Grampian DP8



Grampian boom arm



Grundig GDM317



Grundig GDM321

phone with cardioid response. Recommended for acoustically unfavourable conditions. Output impedance: 200 ohms and 22K (dual). FR: 50Hz-12.5kHz. Supplied with tripod table stand. Price: £10.50.

**GDM321 ★**

Moving coil stick microphone. Dual low/high impedance, 200 ohms/100K. FR: 40Hz-20kHz. Supplied with adjustable table stand. Price: £17.85.

**GDM322**

Moving coil stick microphone with cardioid response. Dual low/high impedance, 200 ohms/100K. FR: 50Hz-17kHz. Supplied with adjustable table stand. Price: £19.95.

**GDM328 ★**

Transistorised reverberation microphone. Reverb on-off switch. Controllable up to 2 secs delay. Dual low/high impedance, 250 ohms/10K. Power supply: PP3 battery. Price: £35.75.

**S15 stand**

General-purpose folding stand. Opens to 5ft. Folded size: 16 × 2¼ in. Price: £5.10.

■ **ITT-STC**

ITT Components Group Europe,  
Standard Telephones & Cables Ltd,  
Electro-Mechanical Product Division,  
West Road, Harlow, Essex.  
Tel: Harlow 26811.

**4037**

Omni-directional moving coil stick microphone for field work and P.A. Extremely rugged in construction. FR: 80Hz-10kHz. Impedance 30 ohms or 300 ohms. Sensitivity -76dB. Long (A) or short (C) models available. Price: £27.

**4038**

Studio ribbon microphone. Accurate figure-of-eight response. Flat frequency response 30Hz-15kHz. Impedance 30 ohms or 300 ohms. Sensitivity -85dB. Non-linear distortion 0.1% Controlled transient response. Price: £60.

**4104**

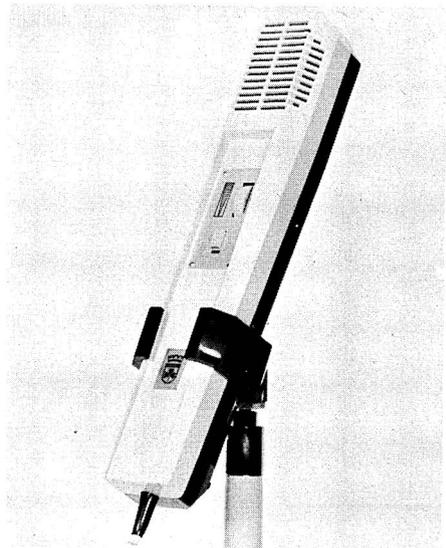
Broadcast quality commentator's noise-cancelling ribbon lip microphone. Output -82 dB. Impedance 30 or 300 ohms. Price: £75.

**4105A**

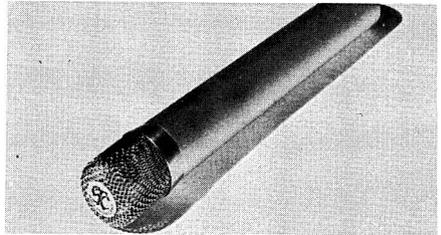
Cardioid moving coil microphone specially designed for speech. Flat response 60-10,000Hz. Impedance 30 ohms. Sensitivity -82dB. Front to back ratio 15-20dB. Price: £27.

**4136 ★**

Condenser cardioid microphone, uniform polar frequency response. Front/back ratio better than 20dB. FR: 40Hz-18kHz. Impedance 30 or 300 ohms. Sensitivity -50dB at 300 ohms. FET head amplifier. Phantom powersupply for combined mains and battery supply unit. Complete



Grundig GDM328



ITT 4136

system with windshield and connecting cable. £110.

■ **LEM**

Distributors: Douglas A. Lyons and Associates Ltd, 8 Ryeccotes Mead, Dulwich, London, SE21. Tel: 01-693 2855.  
Cables: Daliona London, SE21.

**DH80**

Miniature moving coil. Omni-directional. FR: 70Hz-14kHz ±4dB. Imp 50 ohms or 80K. Sensitivity: (low imp) -82dB, (high imp) -52dB. May be used as hand microphone, desk stand, or attached to floor stand. Price: (low impedance) £6.30; (high impedance) £7.95.

**DO35**

Miniature lavalier moving coil microphone. Omni-directional. FR: 80Hz-12kHz. ±3dB. Sensitivity: -80dB. Imp 200 ohms. Can also be used as hand or stand microphone. Size: 2¼ in long, ¾ in diameter. Weight: 1½ oz. Price: £18.50.

★ Indicates entry is illustrated

#### **DO21B**

Studio-quality omni-directional moving coil microphone. FR 30Hz-16kHz.  $\pm 3$ dB. Imp 50 ohms or 200 ohms. Sensitivity (200 ohms) - 77dB. Individually calibrated response curves. Suitable for hand or stand use. Price: £18.50.

#### **DO20**

Hand or stand type moving coil microphone. Omni-directional. FR: 40Hz-15kHz. Impedance: 50 ohms, 200 ohms or 80K. Sensitivity: 50 ohms - 82dB, 200 ohms - 76dB, 80K - 50dB. Internal element resiliently mounted to avoid mechanical shock. Price: £12.50.

#### **DO42**

Miniature lavalier. Similar specification to type DO35 but incorporates special features to avoid rubbing noises. Price: £20.

### ■ LUSTRAPHONE LTD

St George's Works, Regent's Park Road, London, NW1. Tel: 01-722 8844.

#### **4-20**

Mono, moving coil, omni-directional stick type with clip for stand mounting. FR: 50Hz-15kHz  $\pm 5$ dB. Sensitivity: -80dB ref 1V/ $\mu$ b. Impedance: multiple, 30 ohms, 200 ohms, 600 ohms or higher. Built-in windshield and anti-noise protection. Finish: black and silver anodised aluminium. Price: £15.75.

#### **4-30**

Mono, moving coil cardioid stick type with clip for stand mounting. Sensitivity: -78dB ref 1V/ $\mu$ b. Impedance: multiple, 30 ohms, 200 ohms, 600 ohms or higher. FR: 50Hz-15kHz  $\pm 3$ dB. Built-in windshield and anti-noise protection. Finish: black and silver anodised aluminium. Price: £20.25.

#### **4-50**

Mono bi-directional ribbon stick type with clip for stand mounting. Sensitivity: -86dB (at 600 ohms). Impedance: multiple, 30 ohms, 200 ohms, 600 ohms or 50K. FR: 50Hz-17kHz  $\pm 3$ dB. Built-in windshield and anti-noise protection. Finish: black and silver anodised aluminium. Price: £18.90.

#### **5-01**

Hand, stick or clip microphone. Moving coil. FR: 50Hz-12kHz. Sensitivity: -80dB. Price: £10.

#### **5-02**

Same as 5-01 but with built-in switch. Price: £11.

#### **5-11**

Miniature moving coil lavalier microphone with neck harness. FR: 70Hz-11kHz. Sensitivity: -75dB. Price: £10.10.

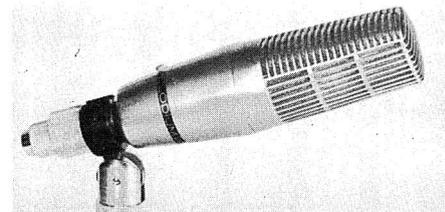
Wide range of swan neck mounts, adaptors,



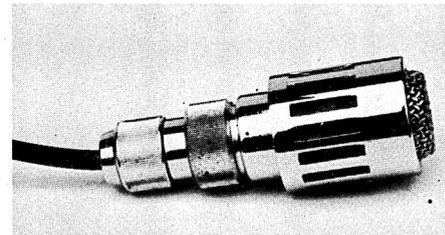
Melodium 76A



Melodium 77A



Melodium RM6



Melodium C121A

table and floor stands and microphone accessories.

### ■ MELODIUM

Distributor: Keith Monks (Audio) Ltd,  
5 Fleet Road, Fleet, near Aldershot, Hants.  
Tel: Fleet 7316.  
(24-hour answering service Fleet 3566.)

#### 76A ★

Moving coil, cardioid. FR: 100Hz-15kHz (3dB). Sensitivity: -63dB (0dB=1mW/10 microbars) 30 ohms or 200 ohms impedance. Windshields available. Price: (head) £13-50.

#### 77A ★

Moving coil omni-directional. FR: 40Hz-17kHz  $\pm$  3dB. Sensitivity: -72dB=0.25mV. 200 ohms impedance: Hand stick. Clamp fitting with  $\frac{1}{2}$ in Whit. Windshields available. Black plastic. Price: £32-85.

#### 78A or 78A/108

Moving coil cardioid. FR: 50Hz-15kHz  $\pm$  3dB. Sensitivity: -67dB (0dB=1mW/10 microbars, 0.042mV/microbar). 30 ohms or 600 ohms impedance. Stick, head removable for fitting to swan neck. Clamp or swan neck fitting.  $\frac{1}{2}$ in Whit. Switch available on microphone or swan neck. Windshields available. Steel. Price: (head) £16-30; (stick mic) £26-05.

#### RM6 ★

Ribbon bi-directional. FR: 30Hz-18kHz  $\pm$  2dB. Sensitivity: (200 ohms) -56dB 0.16mV/microbar, (50 ohms) -61dB 0.09mV/microbar (0dB=1mW/10 microbar), 50 ohms or 200 ohms impedance. Stick. Clamp fitting. Four position sensitivity and on/off switch. Steel. Price: £43-75.

#### C121 ★

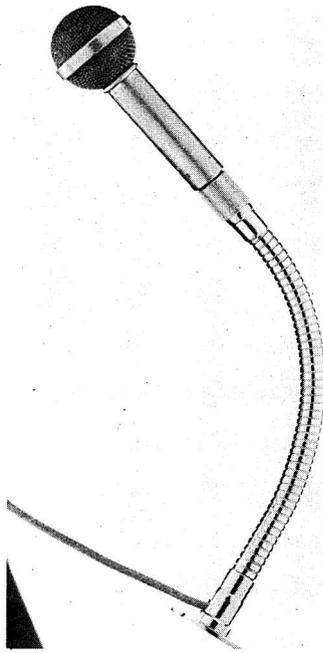
Moving coil. Cardioid. Noise-cancelling miniature. FR: 150Hz-14kHz  $\pm$  3dB. Sensitivity: -89dB (0.036mV). Removable head for fitting to swan neck or for use as stick mic. Price: (head) £12-85.

#### C133 ★

Moving coil. Cardioid. Stick type mic. FR: 50 Hz-15kHz  $\pm$  3dB. Sensitivity: -83dB (0.072 mV) at 30 ohms, -71dB (0.28mV) at 600 ohms. Built-in pop shield. With or without on-off switch. Melodium or three-pin DIN screened plug. Price: (less on-off switch) £17-25; (with on-off switch) £18-90. Lead, plug and clamp extra.

#### Optional accessories

Wide range of plugs, sockets, adaptors, clamps, goosenecks, stands, stereo bars, mounting blocks, windshields, lavalier cords, transformers and adaptors. Full details and prices on request.



Melodium C133 with 326 gooseneck

### ■ KEITH MONKS (Audio) LTD

5 Fleet Road, Fleet, near Aldershot, Hants.  
Tel: Fleet 7316.

#### Microphone stands

High quality chrome finish. Detachable legs with rubber feet. Nylon bushes. Model MS/S: (36-60in) £6-75. Model MS/M: (36-69in) £9-25. Model MS/P: (44-67in) £11-75. Model MS/L: (40-72in) £13. Model MS/C: (cast base) £6-75. Model BS/1: (banqueting stand 14-24in) £5-25. Model BS/2: (as BS/1 but 20-36in) £6-75.

#### Boom arms

For use with most Keith Monks microphone stands. Thread adaptors available for use with other makes of stand. Model BA/S: (38in) £5. Model BA/A: (42in) £5-75. Model BA/L: (64in) £8. Model TV/1B: (12in boom arm) £5. Model BA/C: (suitable for use with MS/C) £5-75. Thread adaptors: 25p.

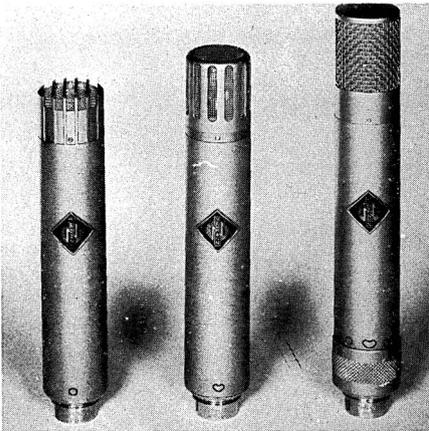
### ■ NEUMANN GMBH

Sole UK Agents: F. W. O. Bauch Ltd,  
49 Theobald Street, Boreham Wood, Herts.  
Tel: 01-953 0091.

#### U67

Condenser. Switchable: omni-directional, car-

★ Indicates entry is illustrated



Neumann KM53C, KM54C, KM56C



Neumann U64

Neumann KM88

dioid, figure-of-eight. FR: 30Hz-16kHz  $\pm$ 2dB. Sensitivity across 1K: 2mV/dyne/cm<sup>2</sup> in cardioid, 1.1mV/dyne/cm<sup>2</sup> in omnidirectional, 1.4 mV/dyne/cm<sup>2</sup> in figure-of-eight. Impedance 50 or 200 ohms. Built-in transformer. Special sensitivity and bass cut switches. Printed circuit. Pressure gradient mic. Price on application.

#### M269c

Condenser. Remote controlled: omnidirectional, cardioid, figure-of-eight (continuously variable). FR: 30Hz-16kHz  $\pm$ 2dB. Sensitivity across 1K: 0.9mV/dyne/cm<sup>2</sup> in omnidirectional, 1.0 (1.55) mV/dyne/cm<sup>2</sup> in cardioid, 1.1 mV/dyne/cm<sup>2</sup> in figure-of-eight. Impedance 50 or 200 ohms. Built-in transformer. Special sen-

sitivity and bass cut switches. Printed circuit. Remote controlled pressure-gradient mic. Price on application.

#### M49c

Condenser. Remote controlled: omnidirectional, cardioid, figure-of-eight (continuously variable). FR: 35Hz-15kHz  $\pm$ 2dB. Sensitivity across 1K: 0.7mV/dyne/cm<sup>2</sup>. Imp 50 or 200 ohms. Built-in transformer. Remote controlled pressure-gradient mic. Price on application.

#### M50c

Condenser. Omnidirectional. FR: 40Hz-16kHz  $\pm$ 2dB. Sensitivity across 1K: 1.5mV/dyne/cm<sup>2</sup>. Imp 50 or 200 ohms. Built-in transformer. Pressure mic. Price on application.

#### KM53c ★

Condenser. Omnidirectional. FR: 40Hz-15 kHz  $\pm$ 2dB. Sensitivity across 1K: 1.5mV/dyne/cm<sup>2</sup>. Impedance 50 or 200 ohms. Built-in transformer. Printed circuit. Miniature pressure mic. Price on application.

#### KM54c ★

Condenser. Cardioid. FR: 40Hz-15kHz  $\pm$ 2dB. Sensitivity across 1K: 1.2mV/dyne/cm<sup>2</sup>. Impedance 50 or 200 ohms. Built-in transformer. Printed circuit. Miniature pressure-gradient type mic. Price on application.

#### KM56c ★

Condenser. Switchable: omnidirectional, cardioid, figure-of-eight. FR: 40Hz-15kHz  $\pm$ 2dB. Sensitivity across 1K: 0.8mV/dyne/cm<sup>2</sup>. Imp 50 or 200 ohms. Built-in transformer. Printed circuit. Miniature pressure-gradient mic. Price on application.

#### KM253, KM254, KM256

Condenser mics. RF-proof miniature microphones, otherwise specification as for KM53, KM54, KM56c.

#### KM63

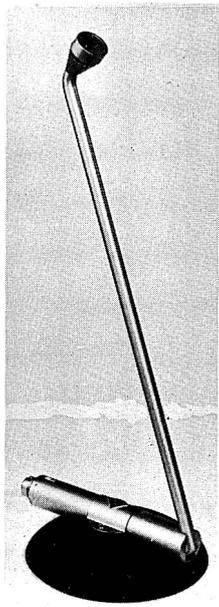
Condenser. Omnidirectional. FR: 40Hz-18 kHz  $\pm$ 2dB. Sensitivity across 1K: 0.9mV/dyne/cm<sup>2</sup>. Impedance 50 or 200 ohms. Built-in transformer. Special sensitivity switch (-10dB). Printed circuit. Miniature pressure mic. Price on application.

#### KM64

Condenser. Cardioid. FR: 40Hz-18kHz  $\pm$ 2dB. Sensitivity across 1K: 0.9mV/dyne/cm<sup>2</sup>. Imp 50 or 200 ohms. Built-in transformer. Special sensitivity switch (-10dB). Printed circuit. Miniature pressure-gradient mic. Price on application.

#### KM64P ★

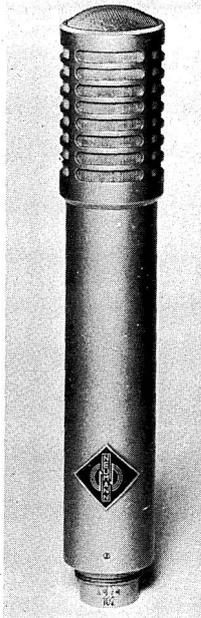
Announcer desk condenser microphone. Cardioid. Response up to 18kHz with bass cut for better intelligibility. Sensitivity across 1K: 0.9 mV/dyne/cm<sup>2</sup>. Impedance 50 or 200 ohms. Built-in transformer. Special sensitivity switch



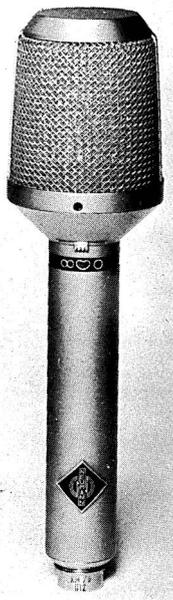
Neumann KM64



Neumann SM69



Neumann KM74



Neumann KM76

(-10dB). Printed circuit. Pressure-gradient mic. Price on application.

#### SRM64

Condenser. Cardioid. FR: 40Hz-18kHz  $\pm$  2dB. Sensitivity across 1K: 0.8mV/dyne/cm<sup>2</sup>. Impedance 50 or 200 ohms. Built-in transformer. Special sensitivity switch (-10dB). Printed circuit. Miniature pressure-gradient mic. Adjustable-height stand. Price on application.

#### KM66

Condenser. Switchable: omni-directional, cardioid, figure-of-eight. FR: 40Hz-16kHz  $\pm$  2dB. Sensitivity across 1K: 2.6mV/dyne/cm<sup>2</sup>. Impedance 50 or 200 ohms. Built-in transformer. Printed circuit. Miniature pressure-gradient mic. Price on application.

#### U64 ★

Condenser. Cardioid. FR: 40Hz-18kHz  $\pm$  2dB. Sensitivity across 1K: 1.1mV/dyne/cm<sup>2</sup>. Imp 50 or 200 ohms. Built-in transformer. Special sensitivity switch (-10dB). Printed circuit. Miniature pressure-gradient mic. Available with combined power units for two or six microphones. Price on application.

#### SM69 ★

Double or stereo condenser. Both systems separately remote controlled: omni-directional,

cardioid, figure-of-eight. FR: 30Hz-16kHz  $\pm$  2dB. Sensitivity across 1K: 1.5mV/dyne/cm<sup>2</sup>. Imp 50 or 200 ohms. Built-in transformers. Printed circuit. Pressure-gradient mics. Price on application.

#### KM73

Transistor (FET) condenser. Omni-directional. FR: 40Hz-16kHz  $\pm$  2dB. Sensitivity across 1K: 2.5mV/dyne/cm<sup>2</sup>. Impedance 200 ohms without transformer. Printed circuit. Miniature pressure mic. Price on application.

#### KM74 ★

Transistor (FET) condenser. Cardioid. FR: 40Hz-16kHz  $\pm$  2dB. Sensitivity across 1K: 2.5mV/dyne/cm<sup>2</sup>. Impedance 200 ohms without transformer. Printed circuit. Miniature pressure-gradient mic. Price on application.

#### KM76 ★

Transistor (FET) condenser. Switchable: omni-directional, cardioid, figure-of-eight. FR: 40Hz-16kHz  $\pm$  2dB. Sensitivity across 1K, 2.6mV/dyne/cm<sup>2</sup>. Impedance 200 ohms without transformer. Printed circuit. Miniature pressure-gradient mic. Price on application.

#### KML

Lavalier transistor (FET) condenser. Cardioid. FR: 40Hz-16kHz  $\pm$  2dB. Sensitivity across 1K:

★ Indicates entry is illustrated

0.5mV (18V) or 1.8mV (45V) per dyne/cm<sup>2</sup>. Impedance 50 or 200 ohms. Built-in transformer. Printed circuit. Battery driven (18V or 45V). Miniature pressure-gradient mic. Price on application.

**U77**

Condenser FET. Switchable omni-directional or cardioid or figure-of-eight. FR: 40Hz-16kHz. Sensitivity across 1K: 2.6mV/microbar (omni), 5mV/microbar (figure-of-eight), 3mV/microbar (cardioid). Impedance 200 ohms. Pressure-gradient mic. Bass cut and sensitivity switch of -10dB. Price on application.

**KM83**

FET condenser. Omni-directional. FR: 40Hz-16kHz. Sensitivity 0.5mV/microbar. Impedance 50 or 200 ohms. Built-in transformer. Sensitivity switch -10dB. Price on application.

**KM84**

FET condenser. Cardioid. FR: 40Hz-16kHz. Sensitivity 0.5mV/microbar. Impedance 50 or 200 ohms. Built-in transformer. Sensitivity switch -10dB. Price on application.

**KM86**

FET condenser. Cardioid. FR: 40Hz-16kHz. Sensitivity: 0.5mV/microbar. Impedance 50 or 200 ohms. Built-in transformer. Sensitivity switch -10dB. Price on application.

**U87**

FET condenser. Switchable to omni-directional, cardioid or figure-of-eight. FR: 40Hz-16kHz. Impedance 50 or 200 ohms. Built-in transformer. Bass cut and sensitivity switch of -10dB. Price on application.

**KM88 ★**

FET condenser. Switchable to omni-directional or cardioid. FR: 40Hz-16kHz. Impedance 50 or 200 ohms. Sensitivity across 1K approx 0.7mV/microbar. Built-in transformer. Sensitivity switch -10dB. Price on application.

**SM69 FET**

Stereo transistor condenser. Both systems separately remote controlled: omni-directional, cardioid or figure-of-eight. FR: 40Hz-16kHz. Sensitivity across 1K 2mV/microbar. Impedance 50 or 200 ohms. Built-in transformers. Pressure-gradient. Price on application.

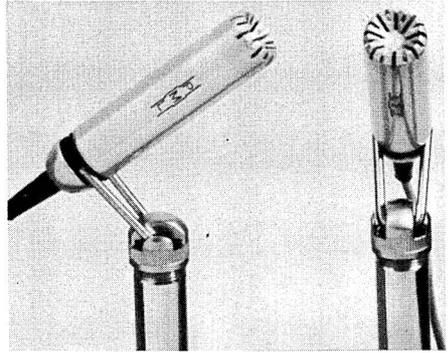
■ **PEARL**

Feldon Audio Ltd, 126 Great Portland Street, London, W1. Tel: 01-580 4314. Telex: 286668.

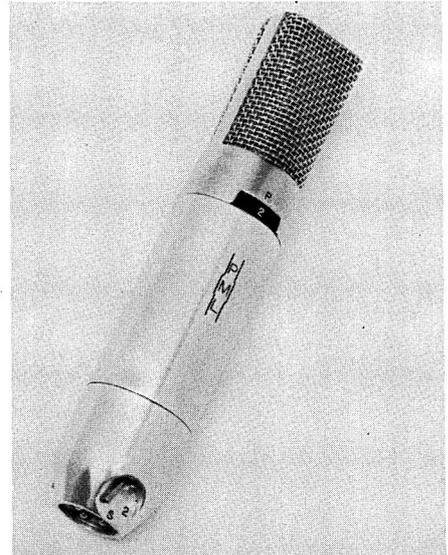
Audio Workshops Ltd, 29 High Street, Robertsbridge, Sussex. Tel: Robertsbridge 580.

**DC20 ★**

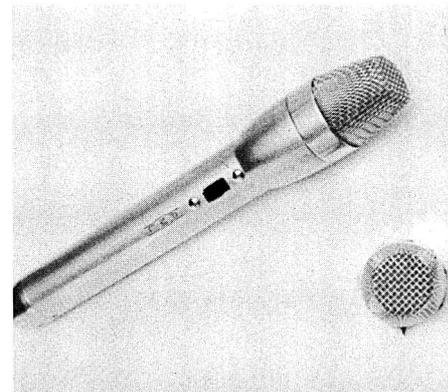
Mono condenser microphone. Omni-direction-



*Pearl DC20*



*Pearl DC63*



*Pearl DC73*

al. FR: 30Hz-20kHz. Sensitivity: -50dB at 200 ohms. Impedance: 200 ohms. Rec load: not less than 200 ohms. Miniature model with stand adaptor.  $\frac{5}{8}$ " x 27in tpi. FET preamp. Shockproof boom mount. Lavalier adaptor. Mains or battery. Mono or stereo power supplies available. Size:  $2\frac{7}{8}$ " x  $\frac{3}{4}$ " in dia. Finish: silver grey anodised alloy with satin chrome grille. Price: £46-25.

**DC21**

Mono condenser microphone. Cardioid. FR: 30Hz-20kHz. Sensitivity: -50dB at 200 ohms. Impedance: 200 ohms. Rec load: not less than 200 ohms. Miniature model with stand adaptor.  $\frac{5}{8}$ " x 27 tpi. FET preamp. Shockproof boom mount. Lavalier adaptor. Mains or battery. Mono or stereo power supplies available. Intended for use in pairs for stereo. Size:  $2\frac{7}{8}$ " x  $\frac{3}{4}$ " in dia. Finish: silver grey anodised alloy with satin chrome grille. Price: £50.

**DC63 ★**

Mono condenser microphone. Continuously variable response pattern. FR: 30Hz-20kHz  $\pm$ 2db. Sensitivity: -56dB. Impedance: 200 ohms. Rec. load: 1K. Miniature stick microphone. Shockproof boom mount with ball joint.  $\frac{5}{8}$ " x 27tpi fitting. Switchable 60Hz roll-off, switchable 5kHz boost. Finish: satin chrome case. Price: on request.

**DC73 ★**

Mono condenser microphone. Cardioid. FR: 30Hz-18kHz. Sensitivity: -52dB at 200 ohms. Impedance: 200 ohms. Rec load: not less than 200 ohms. Hand microphone, stand adaptor supplied.  $\frac{5}{8}$ " x 27tpi. FET preamp. Gooseneck and shockproof boom mount available. Electronic windshield. XLR connector to mic. Intended for use in pairs for stereo. Size:  $2\frac{7}{8}$ " x  $\frac{3}{4}$ " x  $\frac{3}{4}$ " in dia. Finish: silver grey anodised alloy with satin chrome grille. Price: £50.

**EC71**

Mono condenser microphone. Cardioid. FR: 40Hz-18kHz. Sensitivity: -58dB at 200 ohms. Impedance: 50, 200, 600 ohms balanced or high impedance unbalanced according to power supply. Rec load: not less than 200 ohms at that output. Miniature stand microphone, adaptor supplied.  $\frac{5}{8}$ " x 27tpi. Mono or stereo. Mains or battery. Shockproof boom mount available. Lavalier adaptor and windshield available. Intended for stereo use in pairs. Finish: silver grey alloy with satin chrome grille. Price: £38-75.

**EK71**

Mono condenser microphone. Omni-directional. FR: 40Hz-18kHz. Sensitivity: -58dB at 200 ohms. Impedance: 50, 200, 600 ohms balanced or high impedance unbalanced, according to power supply. Rec load: not less than 200 ohms at that output. Miniature stand mic with

adaptor.  $\frac{5}{8}$ " x 27tpi. FET preamplifier. Mono or stereo. Mains or battery power supplies available. Shockproof boom mount. Lavalier adaptor and windshield available. Finish: silver grey anodised alloy with satin chrome grille. Price: £36-25.

**F69**

Mono moving coil microphone. Cardioid. FR: 50Hz-12kHz. Sensitivity: -70dB at 200 ohms. Impedance: 200 ohms. Rec load: not less than 200 ohms. Hand microphone with stand adaptor.  $\frac{5}{8}$ " x 27tpi. Gooseneck with or without switch. Shockproof boom mount. Windshield. XLR connector. Finish: silver grey anodised alloy with satin chrome grille. Price: £40.

**RD16**

Mono moving coil microphone. Cardioid. FR: 40Hz-16kHz. Sensitivity: -70dB. Impedance: 200 ohms. Rec load: not less than 200 ohms. Small hand microphone, stand adaptors supplied.  $\frac{5}{8}$ " x 27tpi. Gooseneck with or without switch available. XLR connector. Diaphragm of special polyester film. Windshield available. Finish: black and silver grey. Price: £21-37 $\frac{1}{2}$ .

**RD34**

Mono moving coil. Cardioid. FR: 40Hz-16kHz. Sensitivity: -74dB at 200 ohms. Impedance: 200 ohms. Rec load: not less than 200 ohms. Stand or gooseneck mounting.  $\frac{5}{8}$ " x 27tpi. Gooseneck type with or without switch. XLR connector. Finish: black and silver grey. Price: £22-5.

**RD36**

Mono moving coil microphone. Cardioid. FR: 40Hz-16kHz. Impedance: 200 ohms balanced or high impedance unbalanced. Sensitivity: -54dB at high impedance, -74dB at 200 ohms. Recommended load: not less than 200 ohms, or high impedance according to connections. Stand or gooseneck type.  $\frac{5}{8}$ " x 27tpi. Gooseneck available. Lavalier adaptor available. Windshield available. XLR connector. Finish: black and silver grey. Price: £22-50.

**TC4**

Mono condenser microphone. Cardioid. FR: 30Hz-20kHz. Sensitivity: -52dB at 200 ohms. Impedance: 50 or 200 ohms. Rec load: not less than 200 ohms for that output. Stick microphone with stand adaptor.  $\frac{5}{8}$ " x 27tpi. Double FET preamp. Shockproof boom mount with ball joint. Locking connector for mic. High vacuum condensed diaphragm. Intended for use in pairs for stereo. Finish: black anodised alloy with satin chrome grille. Price: £101.

**TC4B**

Mono condenser microphone. Figure-of-eight. FR: 30Hz-20kHz. Sensitivity: -56dB at 200 ohms. Impedance: 50 or 200 ohms. Rec load:

★ Indicates entry is illustrated

not less than 200 ohms at that output. Stick microphone with stand adaptor.  $\frac{3}{8}$ in  $\times$  27tpi. Double FET preamp. Shockproof boom mount with ball joint. Locking connector for mic. High vacuum condensed diaphragm. Intended for use in pairs for stereo. Finish: black anodised alloy with satin chrome grille. Price: £106.

#### TC4K

Mono condenser microphone. Omni-directional. FR: 30 Hz-20kHz. Sensitivity: -56dB at 200 ohms. Rec load: not less than 200 ohms at that output. Stick microphone with stand adaptor.  $\frac{3}{8}$ in  $\times$  27tpi. Double FET preamp. Shockproof boom mount with ball joint. Locking connector for mic. High vacuum condensed diaphragm. Finish: black anodised alloy with satin chrome grille. Price: £106.

### ■ PYE BUSINESS COMMUNICATIONS LTD

Orchard Road, Royston, Herts.  
Tel: Royston 44141.

#### Philips EL.6015/11 ★

Moving coil cardioid microphone. FR: 40Hz-18kHz. Impedance 500 ohms. Sensitivity: -71 dB. On-off switch. Quick-release holder for stands with  $\frac{3}{8}$ ,  $\frac{1}{2}$  or  $\frac{5}{8}$ in Whit threads. 10ft twin screened lead. Price: £15.50.

#### Philips EL.6016/11

Moving coil omni-directional microphone. FR: 35Hz-18kHz. Impedance 500 ohms. Sensitivity: -71dB. On-off switch. Quick-release holder for stands with  $\frac{3}{8}$ ,  $\frac{1}{2}$  or  $\frac{5}{8}$ in Whit threads. 10ft twin screened lead. Price: £13.

#### Philips EL.6025/01

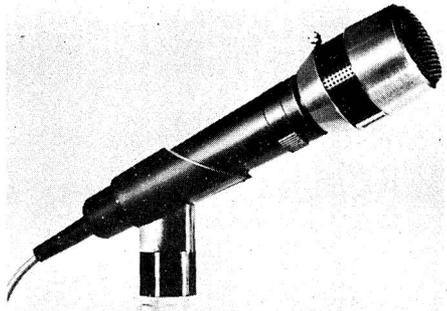
Moving coil cardioid microphone. FR: 40Hz-18kHz. Impedance 500 ohms and 25K. Sensitivity: 500 ohms -71dB, 25K -54dB. Combined on-off and impedance selector switch. Fitted flexible shaft and 10ft twin screened lead. Finish: brushed satin stainless steel head and chromium plated shaft. Fits stand with  $\frac{3}{8}$ ,  $\frac{1}{2}$  or  $\frac{5}{8}$ in Whit threads. Price: £20.

#### Philips LBB9008/05

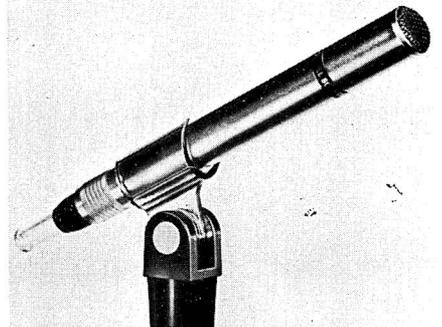
Moving coil cardioid microphone. Similar specification to EL.6025/01. except for panel mounting (or stand mounting with LBC.1201 adaptor) and single impedance (200 ohms). No on-off switch. Capsule with hum-compensating coil. Price: £16.50.

#### Philips EL.6033/10

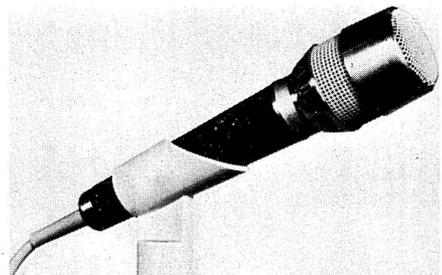
Moving coil. Studio quality. Switchable cardioid or omni-directional. FR: 40Hz-18kHz. Sensitivity: -72dB. Source impedance 500 ohms (EL.6033/00 50 ohms). Special vibration damper optional extra. Supplied with cable and stand adaptor. Price: £28; EL.6207 vibration damper £3.50.



Philips EL6015/11



Philips EL6042



Philips EL6037



Philips LBB9050

**Philips EL.6035/11**

High quality moving coil cardioid microphone. FR: 60Hz-17kHz. Impedance 500 ohms. Sensitivity: -71dB. On-off switch. Quick-release holder for stands  $\frac{3}{8}$ ,  $\frac{1}{2}$  or  $\frac{5}{8}$ in Whit threads. Three-pole plug (Tuchel T3261/1) for detachable cable. Price: £18.

**Philips EL.6036/10**

High quality omni-directional moving coil. FR: 50Hz-19kHz. Impedance 500 ohms. Sensitivity: -71dB. On-off switch. Quick-release holder for stands with  $\frac{3}{8}$ ,  $\frac{1}{2}$  or  $\frac{5}{8}$ in Whit threads. Three-pole plug (Tuchel T3261/1) for detachable cable. Price: £18.

**Philips EL.6042/05 ★**

Professional quality omni-directional moving coil. FR: 30Hz-20kHz. Impedance 200 ohms. Sensitivity: -79dB at 1kHz reference 1V/ $\mu$  bar. Size:  $5\frac{3}{8} \times \frac{3}{4}$ in. Finish: matt chrome plate. Quick-release holder-clamp for stands with  $\frac{3}{8}$ ,  $\frac{1}{2}$  or  $\frac{5}{8}$ in Whit threads. Three-pole plug for twin screened cable. Individually calibrated frequency response. Price: £32.

**Philips EL.6061/02**

Moving coil, noise cancelling. On/off and control switch. FR: 150Hz-15kHz. Source impedance 500 ohms. Mounting bracket. Price: £13-50.

**Philips LBB9003/05**

Moving coil omni-directional lavalier microphone. FR: 50Hz-15kHz. Impedance 200 ohms. Sensitivity: -78dB. Suitable also for hand use. Complete with neck cord and 33ft cable. Price: £14.

**Philips EL.6037 ★**

High quality moving coil. Cardioid. FR: 40Hz-18kHz. Impedance 500 ohms and 25K. Sensitivity: -71dB (500 ohms); -54dB (25K). Rosewood body. Supplied with 10ft cable. Quick release adaptor. Price: £30.

**Philips EL.6204**

Universal microphone table stand. Provided with  $\frac{3}{8}$ in Whit thread and possibility of mounting signal lamps or switches, etc. Price: £3.

**Philips LBB9050/05 ★**

Studio quality dual capsule microphone with crossover filters. Moving coil. Cardioid. FR: 25Hz-20kHz. Impedance: 200 ohms. Sensitivity: -77dB. Quick release holder for all stands. Price: £36.

**Philips LBB9500**

Moving coil cardioid microphone. FR: 40Hz-18kHz. Impedance 500 ohms. Sensitivity: -71dB. Quick release holder. Supplied with tripod table stand and 10ft twin screened lead. Price: £18.

**ET907**

Telescopic floor stand with heavy base. 42in

closed, 72in extended. Price: £9.

**LBC1203/00**

Table stand. Tripod type. Price: £1-50.

**LBC1207/00**

Windshield for EL6015, 6016, 6025, 6026, LBB9500. Price: £1-25.

**LBC1209/00**

Windshield for LBB9050. Price: £1-25.

**EL6207**

Vibration damper for use with EL6033 on floor or table stands. Price: £3-50.

**LBC1200**

Short flexible shaft fitted with socket to accept microphones EL6033, EL6035, EL6042, EL6036. Length 8in. Complete with 5 yards cable. Price: £8-50.

**LBC1205/01**

Cable with switched plug for use with LBB9050, EL6042 and EL6033. Price: £5-25.

**LBC1210/09**

Three-pole DIN microphone plug for use with LBB9050, EL6042, EL6033. Price: £1.

**LBC1208/10**

Ten-metre extension cable complete with plugs. For use with LBB9050, EL6042, EL6033. Price: £4.

**■ RESLOSOUND LTD**

Spring Gardens, London Road, Romford, Essex.

Tel: Romford 61926 (3 lines). Telex: 897311.

**RBT Series**

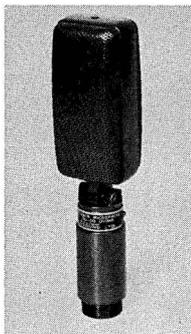
High quality miniature ribbon. FR: 40Hz-14kHz  $\pm$  3dB. Figure-of-eight, modified as required by filter pads. Sensitivity: 58dB below at 40K. Imp RBT/L 30-50 ohms; RBT/M 250 or 600 ohms; RBT/H 30-50 ohms or 40K. A switched model also available with the switch included in a slightly longer body (RBTS/L, RBTS/M, RBTS/H). Finish: satin chrome. Acoustic filter pad for close-talking use. Prices: RBT/L, RBT/M and RBT/H £17-50 each. For switched models add £3.

**CR2 Series**

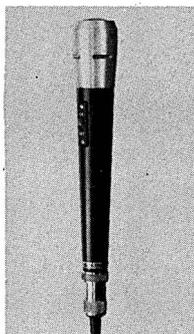
High quality miniature ribbon. FR: 40Hz-16kHz (-2dB at 60Hz,  $\pm$  10dB at 16kHz). Cardioid, figure-of-eight partially suppressed at the rear. Sensitivity: 58dB below for high-Z model. Imp: L, M and H as for RBT Series. Flexible swan neck stem. Finish: satin chrome perforated front, diecast case, silver grey hammertone enamel. Prices: CR2/L, CR2/M and CR2/H £19-50 each.

**SR1 Series ★**

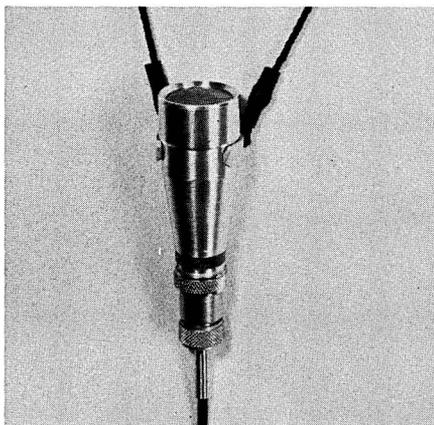
Professional studio ribbon. FR: 30Hz-20kHz +2dB. Nominal figure-of-eight. Damping pads



Reslo SRI



Reslo CPD/2



Reslo MPD/L



Reslo MPD/D

available. Sensitivity:  $-73\text{dB}$  at 300 ohms. Imp: SR1/L 30-50 ohms, SR1/M 250 or 300 ohms. Developed for use by broadcasting authorities and recording studios. Finish: satin chrome. Other finishes to quantity order. Price: (both models) £36.

#### VRT Series

Special miniature ribbon. FR: 30Hz-16kHz ( $-2\text{dB}$  at 40Hz,  $+2\text{dB}$  at 16kHz). Nominal figure-of-eight. Damping pads available. Sensitivity: 81dB below at 300 ohms. Impedance: VRT/L 30/50 ohms, VRT/M 300 ohms. Developed for broadcast and recording studios. Satin chrome finish. Price: (both models) £24.

#### MD3

A special hand held version of MPD Series with direct feed cable. Price: (low impedance) £8-50 (high impedance) £10.

#### CPD Series ★

Cardioid pencil dynamic microphone. FR: 15 Hz-17kHz. Uni-directional partly suppressed at rear. Rear pickup  $-10$ - $20\text{dB}$  over range 200Hz-15kHz. Sensitivity:  $-88\text{dB}$  at 30-50 ohms. Size:  $8\frac{1}{2}$ in overall length,  $1\frac{1}{4}$ in maximum diameter (head). Impedances (switched model): L = 30-50 ohms, M = dual 250 or 600 ohms, H = dual 30-50 ohms or 40K. Unswitched model in low impedance only. Finish: main case black anodised, top case natural satin anodised. Supplied with cable set and plastic stand holder. Prices: CPD/L, CPD/M and CPD/H £22 each.

#### UD.1

Uni-directional hand or stand microphone. FR: 50Hz-17kHz ( $-4\text{dB}$  at 100Hz,  $+8\text{dB}$  at 16kHz). Rear pickup  $-10$  to  $-20\text{dB}$  between 200 Hz-15kHz. Sensitivity:  $-88\text{dB}$  at 30-50 ohms. Output: average voice 6in from front of mic  $150\mu\text{V}$  (low imp),  $250$ - $450\mu\text{V}$  (medium imp),  $2$ - $4\text{mV}$  (high imp). Output increases approximately 10 times at one inch from microphone. Impedances: UD.1/L 30-50 ohms or 600 ohms; UD.1/M medium impedance, 200-300 ohms; UD.1/MT, 600-1,000 ohms; UD.1/H, high impedance. Finish: main case beige nylon, top case satin silver. Price: £23.

#### MPD/L ★

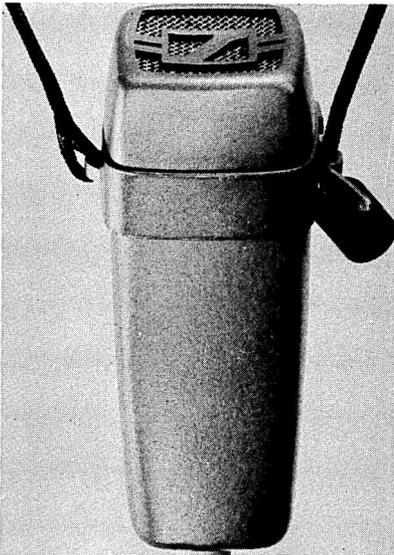
Dynamic, omni-directional, lavalier. FR: 50 Hz-15kHz  $-12\text{dB}$  at 100Hz,  $+4\text{dB}$  at 14kHz. Sensitivity: 88dB below. Impedance: low. Finish: satin anodised. Price: £12.

#### MPD/D ★

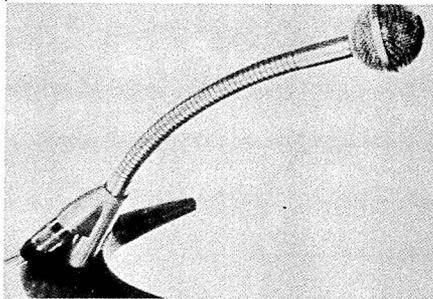
Dynamic, omni-directional, desk base fitted with 8in flexible stem. FR: 50Hz-10kHz. Sensitivity: 88dB below. Impedance: low. Finish: satin anodised microphone, chrome stem, grey enamel base. Price: £14.

#### SL1 Slimline

Dynamic, omni-directional, hand type on stand.



Sennheiser MD214N



Sennheiser MD408N

FR: 100Hz-16kHz. Sensitivity: 84dB below. Impedance: low. Fitting thread: 27tpi  $\frac{3}{8}$ in; 26tpi  $\frac{1}{2}$ in. Finish: all brass finished satin chrome. Price: £28.

#### Coupler unit GE1

Suitable for use with any impedance microphone. Designed for external use adjacent to the tape recorder or amplifier. Gain 35-40dB. FR: 50Hz-20kHz +1dB. Fitted 36in screened lead and jack plug. Self-contained PP4 battery with average life of 1,500 hours. Price: £11.

#### Microphone transformers MT101, MT102

Designed for internal mounting in equipment having only high impedance inputs. Input imp: MT101 15-50 ohms, MT102 300-600 ohms. Nominal output imp 100K. Response 50Hz-15 kHz  $\pm$ 2dB. Price: MT101 £3.50, MT102 £3.50.

#### MS.110B

Adjustable floor stand. Minimum height 40in,

maximum height 62in. Grey hammertone base, chrome outer and inner stem. Price: £11.50.

#### MS.175 and MS.180

Boom arm fitting available for use with Reslo floor stands. Price: £9.

#### MS.200

Adjustable table stand. Minimum height 1ft 4in, maximum height 2ft 2in. Grey hammertone base with chrome stem and extension piece. Price: £7.25.

#### MS.300

Circular desk stand. Grey hammertone base fitted with 3in chrome stem. Price: £4.25.

#### MS.500

Rectangular desk base. Fitted with rubber feet. Finished in silver grey hammertone. Muting switch optional extra. Price: £2.25.

#### Reslo-Audac

Range of radio microphones for all purposes. Full details on request.

### ■ SENNHEISER ELECTRONIC

Distributors: Hayden Laboratories Ltd, East House, Chiltern Avenue, Amersham, Bucks. Tel: Amersham 5511.

Audio equipment showroom, service department and despatch department: 12-13 Poland Street, London, W1V 3DE. Tel: 01-734-3748/9.

#### MD.21HN

Omni-directional moving coil hand or stand microphone. FR: 50Hz-15kHz  $\pm$ 3dB. Sensitivity: -53dB. Impedance: 200 ohms and 30K. Rec. load 200 ohms or 100K. Light alloy case finished hammer stove enamel. Windshield MZW22 optional extra. Price: (microphone) £27.50; (windshield MZ-W22) £5.05; (desk stand MZT21) £2.85.

#### MD.211N

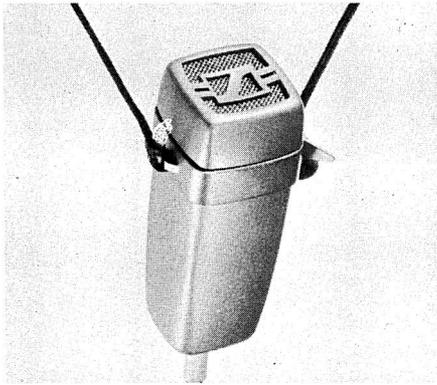
Omni-directional moving coil miniature studio microphone. Hand or stand use. FR: 40Hz-20 kHz  $\pm$ 2.5dB. Sensitivity: -57dB. Impedance: 200 ohms. Rec. load 200 ohms. Metal case with satin chrome finish. Windshield MZW211 optional extra. Price: (microphone) £44; (windshield MZW201) £2.50; (small tripod desk stand MZT104) £2.50.

#### MD.214N ★

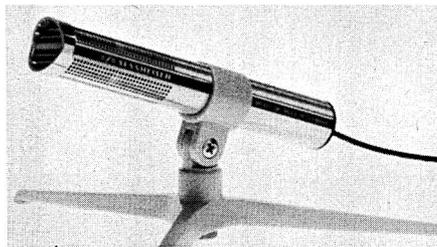
Omni-directional moving coil lavalier microphone. Built-in 'natural voice' equaliser to studio standards. FR specially designed for lavalier operation. Sensitivity: -59dB. Impedance 200 ohms. Rec. load 200 ohms. Metal case finished special 'non-glare' enamel. Price: £44.

#### MD.408N ★

Super cardioid moving coil microphone with



Sennheiser MD214N



MD402LM

flexible shaft. FR: 100Hz-14kHz  $\pm$  3dB. Impedance 200 ohms. Sensitivity: -55dB. Case of light gauze woven wire cloth. Price: £23.

#### MD.411HLM

Super-cardioid moving coil mono microphone. FR: 50Hz-14kHz  $\pm$  4dB. Impedance: (low) 20 ohms, (medium) 800 ohms, (high) 25K. Sensitivity: 0.12mV/ $\mu$ bar, 0.25mV/ $\mu$ bar, 1.25mV/ $\mu$ bar. Rec. load: (low) 50-200 ohms, (medium) 1-2K, (high) 80K. Hand and stand microphone with base fitting clip. Sound from sides and rear heavily attenuated. Case of hardened plastic round metal sleeve. Finish: matt silver. Price: £15.75.

#### MD420-Z

Super-cardioid noise cancelling moving coil mono microphone. FR: 200Hz-10kHz (special response curve for noise cancellation). Impedance 200 ohms. Sensitivity 0.18mV/ $\mu$ bar. Hand or stand microphone with gooseneck and large Tuchel plug. Metal case with silver finish. Price: (MD420-Z) £18.90; (MD420-ZT with switch) £21.

#### MD.421HL

Cardioid moving coil hand or stand microphone. Special frequency response with built-in variable bass attenuator. Impedance 200 ohms or 24K. Rec. load 200 ohms or >50K.  $\frac{3}{8}$ in thread

adaptor supplied. Light grey die-cast case. Windshield MZW22 and heavy desk stand MZT421 optional extras. Price: (microphone) £38; (windshield MZ-W22) £5.05; (desk stand MZT421) £3-15.

#### MD211N

Mono moving coil omni-directional microphone. FR: 40Hz-20kHz. Sensitivity: 0.13mV/ $\mu$ Bar at 1kHz. Impedance: 200 ohms. Rec. load: 200 ohms or greater. Hand/stand mic with optional clip available. Flat frequency response. Available with Cannon connector. Finish: satin chrome. Price: £44.

#### MD214N ★

Mono moving coil omni-directional microphone. FR: 60Hz-15kHz. Sensitivity: 0.1mV/ $\mu$ Bar. Impedance: 200 ohms. Rec. load: 200 ohms or greater. Lavalier microphone with lanyard. Frequency response adjusted to compensate for chest resonances. Double suspension system to eliminate handling noise. Finish: matt grey. Price: £44.

#### MD402LM ★

Mono moving coil super cardioid microphone. FR: 80Hz-12.5kHz. Sensitivity: 2.3mV/ $\mu$ Bar. Impedance: 750 ohms. Rec. load: 4K. Hand mic with stand and clip. Rugged construction. Frequency response tailored for domestic applications. Finish: satin chrome. Price: £10.

#### MD408N ★

Mono moving coil super cardioid microphone. FR: 60Hz-14kHz. Sensitivity: 0.13mV/ $\mu$ Bar. Impedance: 200 ohms. Rec. load: 1K. Specially designed for close-talking applications; Gooseneck with  $\frac{3}{8}$ in fitting. Finish: polished chrome grille. Price: £23.

#### MD415N ★

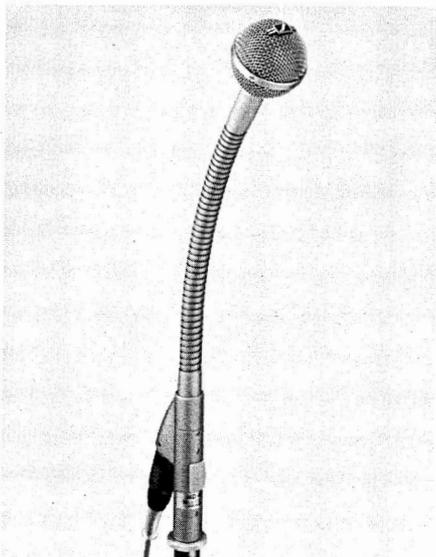
Mono moving coil super cardioid. FR: 60Hz-15kHz. Sensitivity: 0.12mV/ $\mu$ Bar. Impedance: 300 ohms. Rec. load: 200 ohms or greater. Hand/stand microphone. Rugged construction. Built-in anti-popping shield. Good feedback immunity. Finish: solid brass, gold plated. Price: £41.

#### MD421

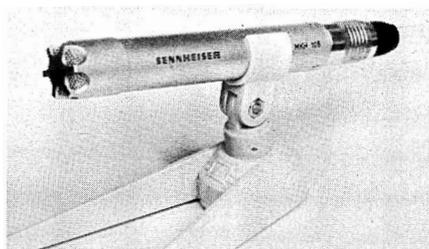
Mono moving coil cardioid microphone. FR: 30Hz-17kHz. Sensitivity: 0.2mV/ $\mu$ Bar at 1kHz. Impedance: (HL series) 200 ohms and 24K; (N, U and 2 series) 200 ohms. Rec. load: (high Z version of HL series) 50K, (all others) 1K. Hand/stick microphone.  $\frac{3}{8}$ in thread fitting. Built-in bass cut switch. Low handling noise. Finish: (standard versions) grey plastic body with chrome grille; (de luxe versions) black plastic body with gold grille. Price: (MD421N) £37; (MD421HL de luxe) £47.50.

#### MD441 ★

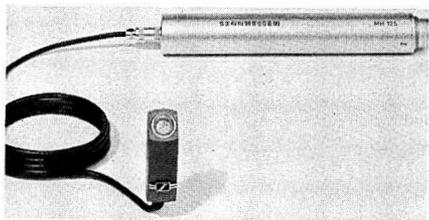
Mono moving coil super cardioid microphone.



Sennheiser MD408N



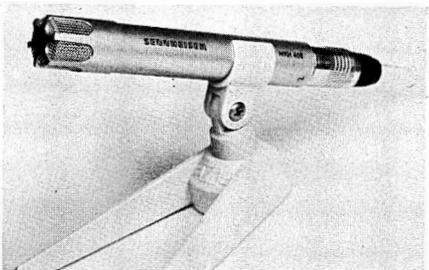
Sennheiser MKH105



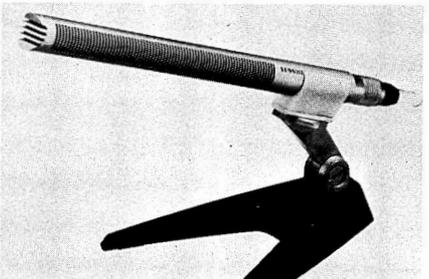
Sennheiser MK125



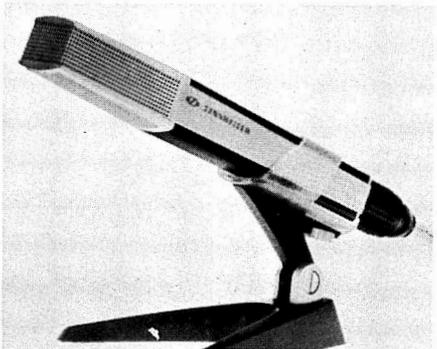
Sennheiser MD409/MD415



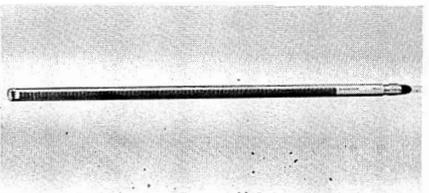
Sennheiser MKH405



Sennheiser MKH415



Sennheiser MD441



Sennheiser MKH815

★ Indicates entry is illustrated

**FR:** 40Hz-20kHz. **Sensitivity:** 0.2mV/ $\mu$ Bar. **Impedance:** 200 ohms. **Rec. load:** 1K. Hand microphone, with optional mounting clip available. Choice of ten switchable frequency responses. Low handling noise. Polar diagram constant over frequency range. Finish: shock resistant metal case. Silver-plated metal grille on matt black body. **Price:** (MD441N, MD441-2, MD441-U) £57.

**MKH105 ★**

Mono capacitor omni-directional microphone. **FR:** 20Hz-20kHz. **Sensitivity:** 2mV/ $\mu$ Bar. **Impedance:** 10 ohms. **Rec. load:** 200 ohms or greater. Hand/stand microphone. Table stands MZT104 and 105 available. Low self noise. Windshield. Finish: satin chrome on brass. **Price:** £91.

**MKH125 ★**

Mono capacitor omni-directional microphone. **FR:** 20Hz-20kHz. **Sensitivity:** 2mV/ $\mu$ Bar. **Impedance:** 10 ohms. **Rec. load:** 200 ohms. Lapel/lavalier microphone with lanyard or clip. Small size. Flat frequency response. Presence lift. Finish: matt grey enamel. **Price:** £132.

**MKH405 ★**

Mono capacitor cardioid microphone. **FR:** 40Hz-20kHz. **Sensitivity:** 2mV/ $\mu$ Bar. **Impedance:** 10 ohms. **Rec. load:** 200 ohms. Hand/stand microphone. MZT104 and 105 stands available. Low self noise. Windshield MZW30. Suitable for use in pairs for stereo. Finish: satin chrome on brass. **Price:** £102.

**MKH415 ★**

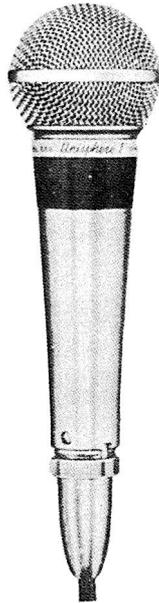
Mono capacitor super cardioid microphone. **FR:** 40Hz-20kHz. **Sensitivity:** 2mV/ $\mu$ Bar. **Impedance:** 20 ohms. **Rec. load:** 200 ohms. Hand/stand microphone. Table stands MZT104 and 105 available. Low self noise. Good wind noise rejection. Windshield MZW415. Finish: satin chrome on brass. **Price:** £114.

**MKH815 ★**

Mono capacitor uni-directional (narrow beam) microphone. **FR:** 50Hz-20kHz. **Sensitivity:** 4mV/ $\mu$ Bar. **Impedance:** 20 ohms. **Rec. load:** 200 ohms. Gun microphone. Fittings: boom MZS805 or pistol grip MZP805. Low self noise. Very narrow beam. Windshield: MZW804 and MZW815. Finish: satin chrome on brass. **Price:** £141.



*Shure 545 Unidyne III*



*Shure 565 Unisphere I*



*Shure 588SA Unisphere B*

■ **SHURE ELECTRONICS LTD**

84 Blackfriars Road, London, SE1.  
Tel: 01-928 3424.

**545 Unidyne III ★**

Cardioid moving coil. **FR:** 50Hz-15kHz. **Sensitivity:** -55dB. **Source impedance:** 25-250 ohms and high. Built-in transformer. **Price:** £33.

**565 Unisphere I ★**

Moving coil. Cardioid (with polar diagram uniform with frequency, symmetrical about axis). FR: 50Hz-15kHz. Dual impedance (50-250 ohms and high). Sensitivity: (low Z) -78dB, (high Z) -55dB. Hand or stand. Built-in wind/breath filter. Available with or without switch. Detachable 15ft three-core screened lead. Finish: satin chrome body with plated steel grille. Size: 6½in long, 2in diameter over head. Price: (565 less switch) £37-80; (565S with switch) £39.

**588SA Unisphere B ★**

Moving coil. Cardioid. FR: 50Hz-13kHz. Impedance: high Z (low version 25-200 ohms available). Sensitivity: (high Z) -59dB, (low Z) -81-5dB. Hand or stand microphone supplied with swivel stand adaptor. Built-in switch with provision for locking on. Wind/breath filter. Detachable 15ft cable. Finish: satin chrome with steel mesh grille. Size: 6½in long, 2½in diameter. Price: (588SA high Z) £24-80; (588SB low Z) £22-80.

**515SA Unidyne B**

Moving coil. Cardioid. FR: 80Hz-13kHz. Sensitivity: -58dB. High impedance (low impedance version available). Hand or stand. On/off switch with lock. Size: 6½in long, 1½in diameter. Satin chrome body with black grille and stainless steel screens. Price: 515SA (high impedance) £16-80; 515SB (low impedance) £16-20.

**■ TURNER**

Distributors: Millbank Electronics,  
The Square, Forest Row, Sussex.  
Tel: Forest Row 2288.

**602 ★**

Mono moving coil microphone. Cardioid response. FR: 80Hz-15kHz  $\pm$  4dB. Sensitivity: -79dB. Impedance: 150 ohms. Stick microphone for hand or stand. Fitting: ⅝in thread 27tpi. On-off switch. Clamp and cable supplied. Finish: satin chrome zinc alloy with cyclomac grille. Price: £28-55.

**700 ★**

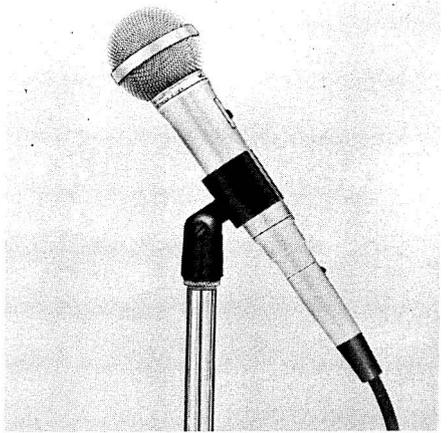
Mono moving coil microphone. Cardioid response. FR: 40Hz-15kHz  $\pm$  4dB. Sensitivity: (150 ohms) -79dB, (40K) -55dB. Impedance: 150 ohms. 40K. Stick microphone for hand or stand. Fitting: ⅝in thread 27tpi. On-off switch. Cannon connector. Dual impedance. Built-in 'pop' filter. Cable and clamp supplied. Finish: satin chrome diecast zinc alloy. Price: £41-70.

**766 ★**

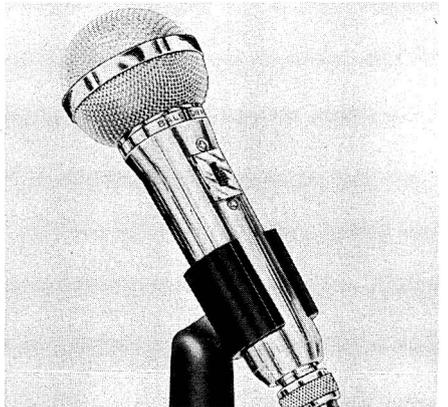
Mono moving coil microphone. Cardioid response. FR: 50Hz-15kHz  $\pm$  5dB. Sensitivity: -55dB. Impedance: 50K. Rec load: 100K. Stick microphone for hand or stand. Fitting: ⅝in thread 27tpi. On-off switch. Blast filter. Lead



Turner 602

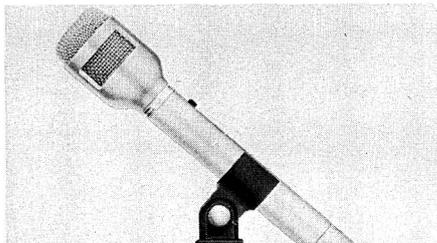


Turner 700



Turner 766

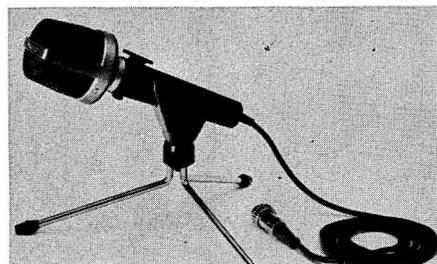
★ Indicates entry is illustrated



Turner 2203



Uher M154



Uher M516

and clamp. Presentation box. Finish: satin chrome steel. Price: £30.75.

**866**

Mono moving coil microphone. Cardioid response. FR: 100Hz-13kHz  $\pm$ 4dB. Sensitivity: -58dB. Impedance: 50K. Stick microphone for hand or stand. Fitting:  $\frac{3}{8}$ in thread 27tpi. Blast filter. Clamp and cable supplied. Presentation case. Finish: satin chrome steel. Price: £17.55.

**2203 ★**

Mono moving coil microphone. Cardioid response. FR: 50Hz-15kHz. Sensitivity: -79dB. Impedance: 150 ohms. Stick microphone for hand or stand. Fitting:  $\frac{3}{8}$ in thread 27tpi. On-off switch. Blast filter. Cannon connector. Cable and clamp supplied. Finish: satin chrome steel. Price: £39.65.

**2266**

Mono moving coil microphone. Cardioid response. FR: 50Hz-15kHz  $\pm$ 5dB. Sensitivity: -58dB. Impedance: 50K. Stick microphone for hand or stand. Fitting:  $\frac{3}{8}$ in thread 27tpi. On-off switch. Supplied with Cannon connector, lead

and presentation box. Finish: steel satin chrome. Price: £39.66.

**2850**

Mono moving coil microphone. Cardioid response. FR: 70Hz-10kHz  $\pm$ 4dB. Sensitivity: -84dB. Impedance: 150 ohms, 50K. Stick microphone for hand or stand. Fitting:  $\frac{3}{8}$ in thread 27tpi. Lightweight. On-off switch. Cable and clamp supplied. Finish: black cycolac. Price: £19.30.

**35A**

Mono moving coil lavalier microphone. Omnidirectional. FR: 80Hz-12kHz  $\pm$ 4dB. Sensitivity: -82dB. Impedance: 150 ohms. Hand or lavalier. Finish: high tensile aluminium with gold finish. Price: £35.15.

**2302**

Mono moving coil microphone. Omnidirectional. FR: 50Hz-15kHz  $\pm$ 5dB. Sensitivity: -79dB. Impedance: 150 ohms. Stick microphone for hand or stand. Fitting:  $\frac{3}{8}$ in thread 27tpi. On-off switch. Cannon connector. Cable and clamp supplied. Finish: steel satin chrome. Price: £32.90.

**2804**

Stereo moving coil. Omnidirectional. FR: 80 Hz-12kHz  $\pm$ 5dB. Sensitivity: -63dB. Impedance: 50K. Stick microphone. Stereo pair in presentation box. Table stands provided. Fitted jack plugs. Price: £17.60.

## ■ UHER

Distributors: Bosch Ltd, Rhodes Way, Radlett Road, Watford, Herts, WD24LB. Tel: Watford 44233.

**M154 ★**

Dynamic microphone with remote control switch providing: record, stop, start, rewind. FR: 50Hz-10kHz. Impedance: 200 ohms. For use with model 5000 tape recorder. Price: £15.39 including PT.

**M516 ★**

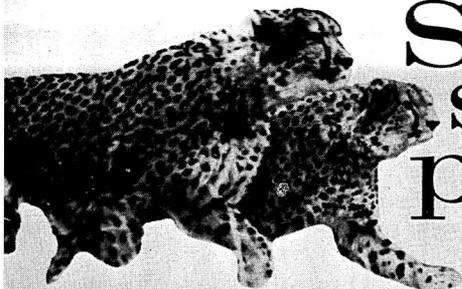
Dynamic cardioid microphone for use with battery portables series. Remote stop/start switch. Speech/music switch. FR: 70Hz-14kHz. Windshield fitted. Impedance 200 ohms. Price: £13.70.

## ■ VITAVOX LTD

Westmoreland Road, London, NW99RJ. Tel: 01-204 4234. Cables: Vitavox, London.

**M100 ★**

Moving coil incorporating tapped transformer giving choice of 25, 200, 10K ohms and high impedance. FR: 50Hz-15kHz  $\pm$ 3dB. Sensitivity -80dB, -71dB, -54dB, -44dB according to impedance. 9ft cable and flexible support. Table, desk and floor stands available. Price: (CN500) £19.50; (CN501) switched £26.70.



# Sleek smooth powerful STE-MA speakers.

Designed and built in Copenhagen by Maurits Andersen, Ste-ma loudspeakers incorporate all that's best in Danish design and craftsmanship. All models are beautifully finished in teak.

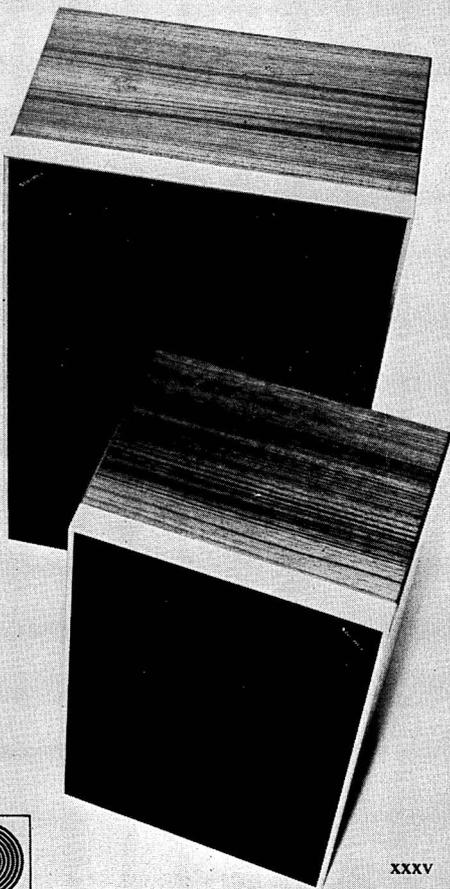
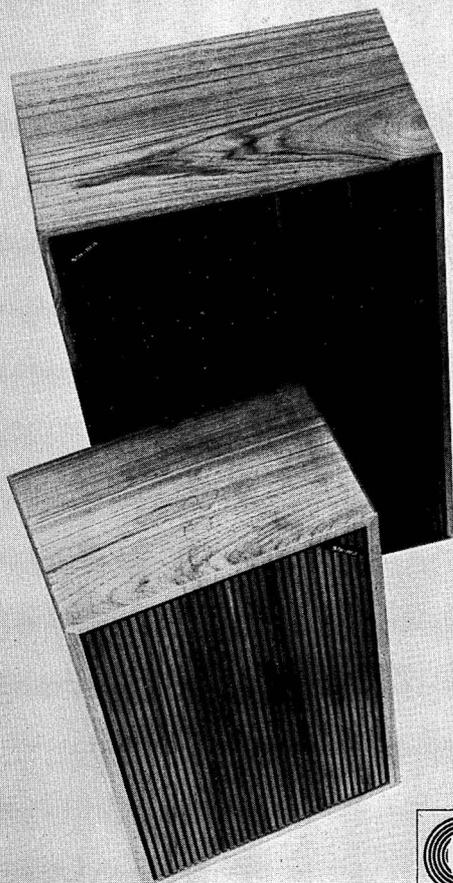
**TOP LEFT.** Model 300. 3-way speaker system. Power handling 18 watts RMS. Frequency range 40-20,000 Hz. Impedance 8 ohms.

**BOTTOM LEFT.** Model 400. 3-way speaker system. Power handling 12 watts RMS. Frequency range 50-18,000 Hz. Impedance 8 ohms.

**TOP RIGHT.** Hi-Fi 4. 4-way speaker system. Power handling 35 watts RMS. Frequency range 30-20,000 Hz. Impedance 8 ohms.

**BOTTOM RIGHT.** Hi-Fi 3. 3-way speaker system. Power handling 30 watts RMS. Frequency range 35-20,000 Hz. Impedance 8 ohms.

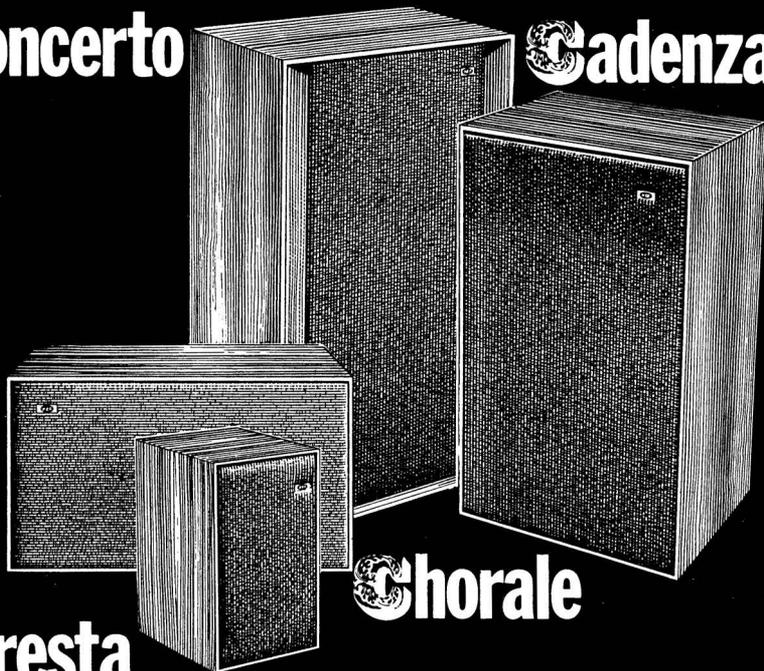
Write for full literature on Ste-ma speakers to sole U.K. Distributors: Kelgrove (Sales) Ltd., 107/113 London Road, London, E.13



# The top s

 **Concerto**

 **Adenza**



 **Cresta**

 **Chorale**

Four loudspeakers which have earned high praise for KEF engineering and design. New materials and new techniques, all specially researched and developed by KEF, reduce 'colouration' to a minimum, and bring a new transparency and clarity to sound reproduction.



**KEF ELECTRONICS LTD, Tovil, Maidstone, Kent. Telephone 0622 57258**

# Directory of Speaker Drive Units

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ ADASTRA ELECTRONICS LTD

Unit 22, Cricklewood Trading Estate,  
Claremont Road, London, NW21TU.  
Tel: 01-452 6288 (answering service 01-452 6289).

### Top 20

Bass speaker. 12in. Fibre cone. Voice coil dia: 1½in. Voice coil material: aluminium. Impedance: 8 ohms and 15 ohms. Gap flux: 12,000 lines. Total flux: 80,000 maxwells. HC: 25W RMS. FR: 25Hz-13kHz. Price £7.

### Hi-Ten ★

Full range speaker. 10in. Fibre cone. vci: 8 ohms or 15 ohms. Voice coil dia: 1in. Voice coil material: copper. Gap flux: 10,000 lines. Total flux: 38,000 maxwells. HC: 10W RMS. FR: 40-10kHz. Price: £3-50 (including PT).

## ■ RICHARD ALLAN RADIO LTD

Bradford Road, Gomersal, Cleckheaton, Yorkshire. Tel: Cleckheaton 2442/3. Cables: Acoustics, Bradford.

### 460TC

4in tweeter. Paper cone. Doped cambric surround. Alcomax II magnet. Voice coil 1½in. Gap flux 6,000 gauss. Total flux 9,000 maxwells. HC 3W. vci: 4-8 or 15 ohms. FR: 2kHz-17kHz. rcf 5kHz. Price: £1-50 (plus 34p PT).

### CB8

8in mid-range. Paper cone, doped cambric surround, voice coil 1in. Ceramic magnet. Gap flux 12,000 gauss. Total flux 48,000 maxwells. HC 5W. vci: 4-8 or 15 ohms. FR: 45Hz-10kHz. Price: £4 (plus 90p PT).

### CB8T

8in paper cone plus tweeter inner. Doped cambric surround. Voice coil 1in. Ceramic magnet. Gap flux 12,000 gauss. Total flux 48,000 maxwells. HC 5W. vci: 4-8 or 15 ohms. FR: 45Hz-15kHz. Price: £4-15 (plus 94p PT).

### CB4 Tweeter

4in paper cone. Doped cambric surround. Ceramic magnet. Voice coil 1½in. Gap flux 10,000 gauss. Total flux 15,000 maxwells. HC:

3W. vci: 4-8 or 15 ohms. FR: 2kHz-17kHz. rcf 5kHz. Price: £1-95 (plus 44p PT).

### CC8

8in bass/mid-range unit. Paper cone. Doped cambric surround. Ceramic magnet. Voice coil 1in. Gap flux: 12,000 gauss. Total flux: 48,000 maxwells. HC: 5W. vci: 4-8 or 15 ohms. FR: 35Hz-10kHz. Price: £4 (plus 90p PT).

### CF8

8in unit. Paper cone. Moulded polyurethane surround. Ceramic magnet. Resonance 25Hz. Voice coil 1in. Gap flux: 14,000 gauss. Total flux: 56,000 maxwells. HC: 6W. vci: 4-8 or 15 ohms. FR: 25Hz-8kHz. Price: £5-75 (plus £1-30 PT).

### CG8T

8in paper cone, doped cambric surround plus tweeter inner. Voice coil 1in. Ceramic magnet. Gap flux 14,000 gauss. Total flux 56,000 maxwells. HC 6W. vci: 4-8 or 15 ohms. FR: 45Hz-15kHz. Price: £6 (plus £1-36 PT).

### CG8

8in paper cone, doped cambric surround. Voice coil 1in. Gap flux 14,000 gauss. Total flux 56,000 maxwells. HC 6W. vci: 4-8 or 15 ohms. Ceramic magnet. FR: 45Hz-10kHz. Price: £5-75 (plus £1-30 PT).

### CG10

10in paper cone, doped cambric surround. Ceramic magnet. Voice coil 1½in. Gap flux 14,000 gauss. Total flux 105,000 maxwells. HC: 10W. vci: 4-8 or 15 ohms. FR: 40Hz-10kHz. Price: £8-50 (£1-92 PT).

### CG10T

10in paper cone, doped cambric surround plus tweeter inner. Voice coil 1½in. Ceramic magnet. Gap flux 14,000 gauss. Total flux 105,000 maxwells. HC 10W. vci: 4-8 or 15 ohms. FR: 40Hz-15kHz. Price: £9 (plus £2-03 PT).

### CG12

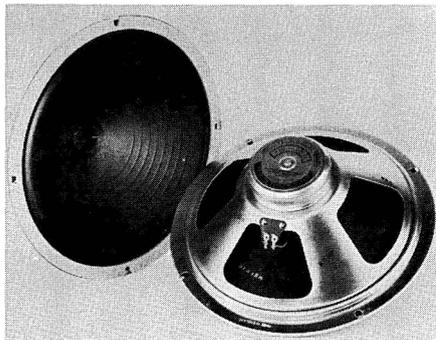
12in single paper cone. Doped cambric surround. Ceramic magnet. Voice coil 1½in (copper). vci: 4-8 or 15 ohms. Gap flux 14,000 gauss. Total flux 105,000 maxwells. Ceramic magnet. HC 10W. FR: 25Hz-9kHz. rcf 1kHz. Price: £10. (No PT).

### CG12T ★

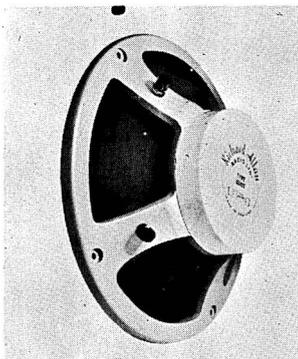
12in paper cone plus tweeter inner. Ceramic magnet. Doped fabric surround. Voice coil 1½in. vci: 4-8 or 15 ohms. Gap flux: 14,000 gauss. Total flux: 105,000 maxwells HC: 10W. FR: 25Hz-15kHz. Price: £10-25 (no PT).

### CG12 Super

12in paper cone, doped cambric surround. Ceramic magnet. Voice coil 2in. Gap flux 14,000 gauss. Total flux 186,000 maxwells. HC: 15W. vci: 8 or 15 ohms. FR: 25Hz-5kHz. Price: £13 (no PT).



Adastra Hi-Ten



Richard Allan CG12T



Altec-Lansing 604E

#### CG15

15in paper cone, doped cambric surround. Ceramic magnet. Voice coil 2in. Gap flux 17,000 gauss. Total flux 220,000 maxwells. HC: 20W. vci: 8 or 15 ohms. FR: 20Hz-5kHz. Price: £21-50 (no PT).

#### CM8

8in mid-range unit. Paper cone. Doped cambric surround. Ceramic magnet. Voice coil 1in. Gap flux: 12,000 gauss. Total flux: 48,000 maxwells. HC: 5W. vci: 4-8 or 15 ohms. FR: 75Hz-10kHz. Price: £4 (plus 90p PT).

#### CP8

8in mid-range unit. Paper cone. Doped cambric surround. Ceramic magnet. vci: 4-8 or 15 ohms. Voice coil: 1in. Gap flux: 10,000 gauss. Total flux: 40,000 maxwells, HC: 5W. FR: 75Hz-10kHz. Price: £3-30 (plus 75p PT).

#### CR5

5in paper cone. Neoprene surround. Ceramic magnet. Voice coil 1in. Gap flux 14,000 gauss. Total flux 56,000 maxwells. HC: 10W. vci: 4-8 or 15 ohms. FR: 30Hz-8kHz. Specially designed for use in small volume infinite baffle enclosure. Price: £5 (plus £1-13 PT).

\*Richard Allan full-range speaker modules are included in Speaker Enclosure section. Twin Assembly, Triple Assembly and Super Assembly speaker kits are in the Constructional Kits section.

#### ALTEC LANSING

Ling Dynamic Systems Ltd, Baldock Road, Royston, Herts, SG8 5BQ.

Tel: Royston 42424. Telex: 81174.

#### 604E ★

Duplex speaker unit with crossover. 15½in nominal diameter. Separate LF and HF cone and speech coil assemblies. Damped high compliance edge suspension. LF voice coil 3in diameter, HF voice coil 1½in diameter. Impedance: designed to operate from 8 ohms or 16 ohms. Alnico V magnets: (LF) 4-4lb, (HF) 1-2lb. HC: 35W RMS (50W peak). FR: 20Hz-22kHz. Crossover (included in speaker) 1-5kHz. LF cone resonance: 25Hz. Horizontal distribution 90°, vertical distribution 40°. Flux: LF 13,000 gauss, HF 15,500 gauss. Weight: 34lb. Finish: white and grey. Recommended enclosures: 859A, 860A, 612A, 614A (enclosures not available in UK at present). Price: £117.

#### ASTE

A. S. Techniques, 35 Waterloo Street, Leicester. Tel: Leicester 26319.

#### Sound motor

Full-range 7½in driver unit. FR: 30Hz-22kHz. HC: 15W RMS. Impedance: 8 ohms (4 ohms

## SPEAKER DRIVE UNITS



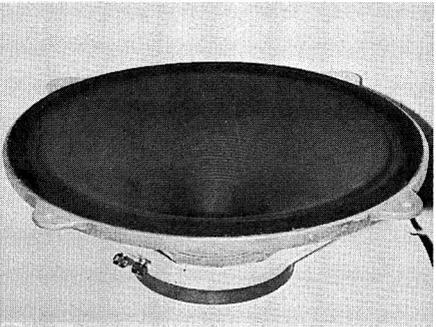
*Baker 12in Major*



*Baker 12in De Luxe Mk II*



*Baker 12in Superb*



*Baker 15in Auditorium*

and 15 ohms available to order). Weight: 7½lb. Specially developed cone and termination. Recommended cabinet plans available from the makers. Price: £15.75 (no PT).

### ■ BAKER REPRODUCERS LTD

Bensham Manor Road Passage, Thornton Heath, Surrey. Tel: 01-684 1665.

#### **Regent**

Full range 12in cone speaker. Paper cone with roll surround. Voice coil 1½in. Copper voice coil. vci: 3, 8 or 15 ohms. Gap flux 12,000 gauss. HC 15W RMS. FR: 45Hz-13kHz. Price: £7.

#### **Major ★**

Full range 12in speaker with built-in tweeter cone. 14,000 gauss magnetic gap. FR: 40Hz-14.5kHz. HC 20W RMS. vci: 3, 8 or 15 ohms. Cast aluminium chassis. Weight: 6lb. Price: £9.

#### **Deluxe Mk II ★**

Full range 12in cone speaker. 15W RMS. Bass resonance 30Hz. Gap flux 14,000 gauss. Copper voice coil 1½in diameter. vci: 8 or 15 ohms. Paper cone with foam plastic surround. Built-in tweeter cone. FR: 25Hz-16kHz. Cast aluminium chassis. Depth 6in. Weight: 6lb. Price: £10.

#### **Superb Twelve ★**

Full range 12in speaker with built-in tweeter cone. Foam plastic surround. Coil diameter: 1½in. vci: 8 or 15 ohms. Gap flux 16,500 gauss HC 20W RMS. FR: 20Hz-17kHz. Bass resonance 25Hz. Copper speech coil. Diecast aluminium chassis. Weight: 10lb. Price: £15.

#### **Auditorium 12**

Full range 12in cone speaker suitable for bass unit in multi-speaker system. HC 25W RMS. Bass resonance 35Hz. Gap flux 15,000 gauss. Copper voice coil 1½in diameter. vci: 8 or 15 ohms. FR: 25Hz-16kHz. Paper cone with roll surround. Cast aluminium chassis. Depth 7in. Weight: 10lb. Price: £14.

#### **Auditorium 15 ★**

High power 15in speaker suitable for bass unit in multi-speaker system. HC 35W RMS. Bass resonance 35Hz. Gap flux 15,000 gauss. vci: 8 or 15 ohms. FR: 20Hz-14kHz. 2in diameter voice coil. 35W RMS. Depth: 8in. Weight: 15lb. Price: £19.

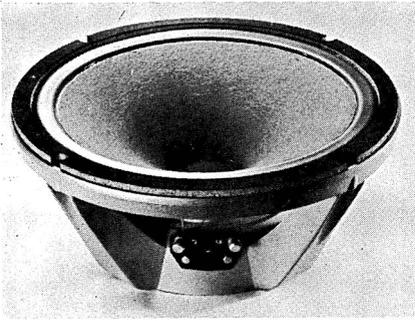
#### **Laboratory Standard 12**

Full range 12in speaker employing patented differential wave impedance cone. Resin-impregnated paper cone with double central metallic ellipse. 1½in diameter copper voice coil. Rubber roll surround. Impedance: 8 or 15 ohms. Gap flux 15,000 gauss. HC 15W RMS. FR: 20Hz-20kHz. Bass resonance 22-27Hz. Price: £22.

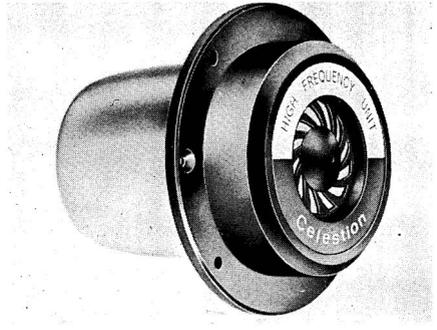
#### **Laboratory Standard 15**

Medium range 15in speaker employing patented

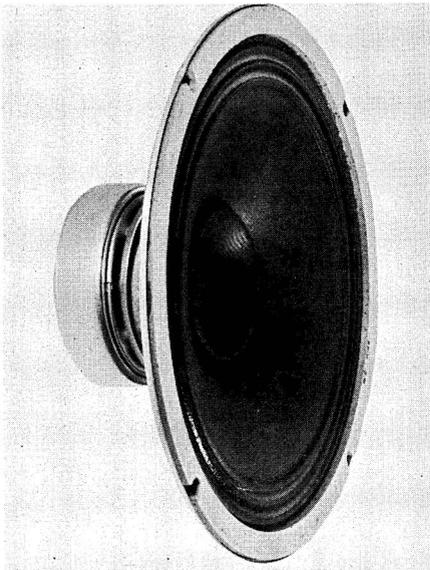
★ Indicates entry is illustrated



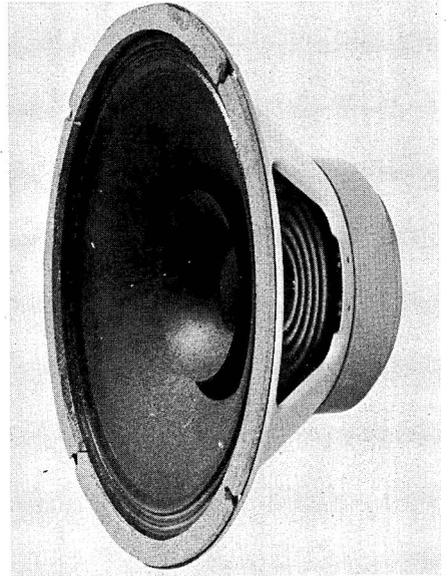
*Celestion Studio 12*



*Celestion HF1300 Mk 2*



*Celestion PS8TC*



*Celestion PS12TC*

differential wave impedance cone. Resin-impregnated paper cone with central metallic ellipse. Foam plastic surround. 2in diameter copper voice coil. vci: 15 ohms. Cast aluminium chassis. Gap flux 15,000 gauss. HC 20W RMS. FR: 20Hz-12kHz. Bass resonance 18-25Hz. Price: £28.

**Group 25**

12in cone speaker with heavy duty suspension for electronic music, guitars, etc. HC 25W RMS. vci: 3, 8 or 15 ohms. Bass resonance 55Hz. FR: 30Hz-13kHz. Gap flux 12,000 gauss. Voice coil 1½in. Depth: 6in. Weight: 5lb. Price: £7.

**Group 35**

12in cone speaker with heavy duty suspension for electronic music, guitars, etc. HC 35W RMS. vci: 3, 8 or 15 ohms. Bass resonance 55Hz. FR:

55Hz-13kHz. Gap flux 14,000 gauss. Voice coil 1½in. Depth: 6½in. Weight: 6lb. Price: £9.

**Group 50**

15in cone speaker with heavy duty suspension for electronic music, guitars, etc. HC 50W RMS. vci: 8 or 15 ohms. Bass resonance 45Hz. FR: 30 Hz-13kHz. Gap flux 17,000 gauss. Voice coil 2in. Depth: 8in. Weight: 15lb. Price: £19.

■ **BURNE-JONES & CO LTD**

18 Brunswick Road, Sutton, Surrey.

**B.J. Treble 20**

Omni-directional multi-horn. One 4in unit. Crossover built-in. FR: 1-18kHz. Size 6 × 5in. Weight: 1½lb. Price: £3.

**B.J. Treble Twin**

Omni-directional horn. Two 4in drive units.

Crossover included. FR: 900Hz-18kHz. Size:  $9 \times 4\frac{1}{2} \times 6$ in. Weight: 2lb. Price: £5-50.

■ **CELESTION**

Rola-Celestion Ltd, Ditton Works, Foxhall Road, Ipswich, Suffolk, IP38JP. Tel: Ipswich 73131.

**Studio Series CX1512**

12in coaxial unit comprising paper cone bass speaker and pressure driven tweeter. Plastaflex surround. Bass voice coil  $1\frac{1}{2}$ in diameter, treble voice coil  $\frac{3}{4}$ in diameter, both copper wound. vci: 15 ohms. Gap flux 13,000 gauss. Total flux 88,000 maxwells. HC: 15W. FR: 30Hz-15kHz. Price: new price pending at time of going to press.

**Studio Series CX2012**

12in coaxial unit comprising paper cone bass speaker and pressure driven tweeter. Hi-flex free surround. Bass voice coil  $1\frac{1}{2}$ in diameter copper wound, treble voice coil 1in diameter aluminium wound. vci: 15 ohms. Gap flux 17,000 gauss. Total flux 180,000 maxwells. HC: 20W. FR: 30Hz-18kHz. Price: new price pending at time of going to press.

**Studio 12 ★**

12in bass unit designed specially for use with HF 1300 Mk 2 and CO3K crossover. Paper cone with ultra compliant rubber surround. Voice coil diameter  $1\frac{1}{2}$ in. vci: 15 ohms. Total flux 88,000 maxwells. HC: 15W RMS. FR: 30Hz-5kHz. Rec. crossover 3kHz. Rigid die-cast chassis. Enclosure details on request. Price: new price pending at time of going to press.

**HF1300 Mk 2 ★**

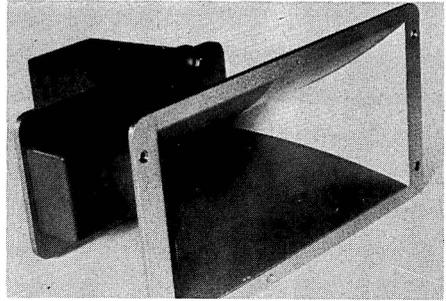
High frequency 3in tweeter. vci: 15 ohms at 10kHz. HC: 5W RMS. Suitable for use with systems up to 20W. FR: 2kHz-15kHz. Rec. crossover 3kHz. Styled with flange to give easy and accurate mounting. Phase correction plate for improved polar response. Self-aligning diaphragm. Contoured pole piece. Damped acoustic cavity to reduce fundamental diaphragm resonance. High flux magnet. Price: new price pending at time of going to press.

**PS8TC ★**

8in twin-cone unit. Designed for the home constructor and recommended by Mullard for use with Unilex audio modules. Impedance: 15 ohms. Resonance: 75Hz. 1in voice coil. Paper cone. Copper voice coil. Gap flux: 10,000 gauss. Total flux: 38,500 maxwells. HC: 6W. FR: 50 Hz-12.5kHz. Price: £2-90 (inc. PT).

**PS12TC ★**

Full-range twin cone unit. 12in diameter.  $1\frac{1}{2}$ in voice coil. Impedance: 4-8 ohms or 15 ohms. Gap flux: 11,500 gauss. Total flux: 128,000 maxwells. HC: 20W RMS. FR: 30Hz-12kHz. Designed for use with the Mullard Unilex stereo system and other similar equipment. Price: £9.



*Decca DK30 Ribbon*



*Eagle CT10 horn tweeter*

■ **DECCA**

Decca Special Products, Ingate Place, Queens-town Road, London, SW8. Tel: 01-622 6677.

**DK30 Ribbon ★**

Horn-loaded high frequency ribbon speaker. Size:  $6\frac{1}{2} \times 3\frac{1}{2} \times 2$ in. Aluminium ribbon element. Impedance 8 ohms constant. HC 30W maximum. FR: 2.5kHz-25kHz. rcf 2.5kHz. Price: £16.

**D1/8 Bass Unit**

Cone speaker designed for bass use. Size:  $12\frac{1}{2} \times 6$ in. Impregnated paper cone. Impregnated-fibre surround. 2in voice coil. Copper voice coil. Impedance 8 ohms at 400Hz. Gap flux 14,000 gauss. Total flux 250,000 maxwells. HC 30W. FR: 30Hz-5kHz. rcf 2.5kHz. Price: £14.

■ **EAGLE INTERNATIONAL**

Heather Park Drive, Wembley HAI 1SU. Tel: 01-903 0144.

**CT5 Cone Tweeter**

Diameter 3in approximately. HC 5W. Rec crossover 3kHz. Price: £1-10.

**CT10 Horn Tweeter ★**

$3\frac{1}{2}$ in aluminium cone and surround. Voice coil 1in (aluminium). vci: 8 ohms. HC 10W. FR: 1.5-18kHz. rcf 3kHz. Price: £1-80.

★ Indicates entry is illustrated

#### FR4

High-compliance full-range 4in unit. FR: 40 Hz-16kHz. Bass resonance 60-70Hz. HC 5W RMS. Flux density: over 10,000 gauss. vci: 8 ohms. Baffle opening: 3½in. Depth: 2in. Price: £3.29 (plus 81p PT).

#### FR6S

High-compliance full-range 6½in unit. FR: 30Hz-18kHz. HC 10W. Flux density: over 11,000 gauss. vci: 8 ohms, Baffle opening: 5½in. Depth 2¾in. Price: £5.13 (plus £1.27 PT).

#### FR8 ★

High-compliance full-range 8in unit. FR: 30 Hz-20kHz. Bass resonance 30-50Hz. HC 15W RMS. Flux density: over 12,000 gauss. vci: 8 ohms. Baffle opening: 6¾in. Depth: 3¾in. Price: £6.11 (plus £1.49 PT).

#### HT15

High frequency horn unit. FR: 2kHz-18kHz. vci: 16 ohms. HC 15W music. rcf 3kHz. Flux density 13,000 gauss. Baffle hole required 2½in. Price: £3.15.

#### HT21

Horn tweeter using centre stabiliser to improve efficiency and loading. FR: 2-20kHz. Crossover: 3kHz. Impedance: 8 ohms. Flux density: 14,000 gauss. HC: 20W. Price: £3.50.

#### DT33

Heavy duty horn tweeter. FR: 2-18kHz. Crossover: 3kHz. Impedance: 8 ohms. Flux density: 14,000 gauss. HC: 30W. Front mounted dome to give wide listening angle. Price: £4.50.

#### KT3

Three-way speaker kit. See Constructional Kits Section for details.

#### ■ ELAC

Electro Acoustic Industries Ltd, Stamford Works, Broad Lane, Tottenham, London, N15. Tel: 01-808 0505. Cables: Elac, London, N15.

#### Elac 8N/148 Mk II (8N/185)

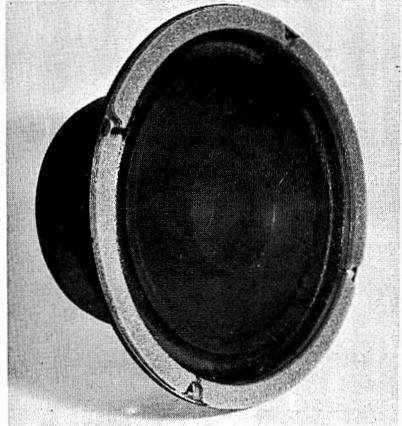
8in. Exponential paper cone. Paper surround, integral with cone. Voice coil 1in copper. vci: 15 ohms. Gap flux 12,000 gauss. Total flux 48,300 maxwells. HC 5 watts. FR: 40Hz-12kHz (loaded conditions), rcf (high frequency) 8kHz. Price: £3.93 (plus 93p PT).

#### ■ EMI

EMI Sound Products Ltd, Component Division, Blyth Road, Hayes, Middlesex. Tel: 01-573 3888.

#### 150

13½ × 8½in wide range elliptical speaker. HC: 10W RMS. Impedance: 3, 8 or 15 ohms. FR: 50Hz-11kHz. Speech coil 1in dia. Flared HF centre cone. Ceramic Magnadure II magnet.



Eagle FR8

Price and recommended enclosure details on request.

#### 215

Matched speaker set. 14 × 9in bass unit, two 5in mid-range and 3½in tweeter. Impedance: 8 ohms. FR: 20Hz-20kHz. HC: 30W. Crossover circuit has adjustable HF and mid-range facilities. Price and recommended enclosure details on application.

#### 250

Matched speaker set comprising 5in bass driver and 3½in tweeter. HC: 8W. Impedance: 8 ohms. FR: 80Hz-20kHz. Crossover: 6.5kHz. Wide suspension roll surround. HF unit response up to 20kHz. Price and recommended enclosure details on request.

#### 315

Matched speaker set. 15in bass unit, two 5in mid-range and two 3½in tweeters. Impedance: 8 ohms. FR: 20Hz-20kHz. HC: 50W. 3in pole piece. Crossover circuit has adjustable HF and midrange facilities. Price and recommended enclosure details on application.

#### 350

Matched speaker set. 13½ × 8in bass unit, with coaxially mounted 3½in tweeter. Crossover frequency: 5kHz. Impedance: 8 ohms. FR: 20Hz-20kHz. HC: 20W. Price and recommended enclosure details on application.

#### 450

Matched speaker set comprising 13½ × 8½in bass driver and two HF units mounted at an angle in front. HC: 10W RMS. FR: 55Hz-13 kHz. Impedance: 3, 8 or 15 ohms. Price and recommended enclosure details on request.

#### 650

Matched speaker set. 10 × 6in bass unit, with coaxially mounted 3½in tweeter. Impedance:

8 ohms. FR: 30Hz-20kHz. Crossover frequency: 5kHz. HC: 5W. Price and recommended enclosure details on application.

**750**

Matched speaker set.  $13\frac{1}{2} \times 8$ in bass unit.  $10 \times 6$ in mid-range and two  $3\frac{3}{8}$ in tweeters. Comprehensive crossover circuit has adjustable mid-range and tweeter facilities. Impedance: 8 ohms. FR: 20Hz-20kHz. HC: 20W. Price and recommended enclosure details on application.

**850**

Matched speaker set comprising  $6\frac{1}{2}$ in bass driver,  $3\frac{3}{4}$ in HF unit and crossover inductor. Impedance: 8ohms. HC: 10W RMS. FR: 65Hz-20kHz. Price and recommended enclosure details on request.

**950**

Matched speaker set. Hand-made  $19 \times 14$ in bass unit, with four HF units mounted across major axis of bass unit. Comprehensive crossover circuit has adjustable mid-range and tweeter facilities. Impedance: 8 ohms. FR: 15Hz-20kHz. HC: 50W. Price and recommended enclosure details on application.

**■ FANE ACOUSTICS LTD**

Hick Lane, Batley, Yorks.

Tel: Batley 6431. Cables: Fane, Batley.

**101/10**

10in ceramic magnet unit with 2in voice coil. HC: 15W RMS. vci: 15 ohms. Main resonance 60Hz. Gap flux 10,000 gauss. Total flux 100,000 maxwells. Single cone, copper voice coil. FR: 40Hz-10kHz. Price: £5-91 (plus £1-43 PT).

**101/10a**

Similar to 101/10 but with twin cone, aluminium voice coil and FR: 40Hz-15kHz. Price: £9-06 (plus £2-20 PT).

**101/12**

Similar to 101/10 but with 12,000 gauss magnet. Price: £7 (plus £1-69 PT).

**101/12a**

Similar to 101/12 but with twin cone, aluminium voice coil and FR: 40Hz-15kHz. Price: £10-15 (plus £2-40 PT).

**101/14**

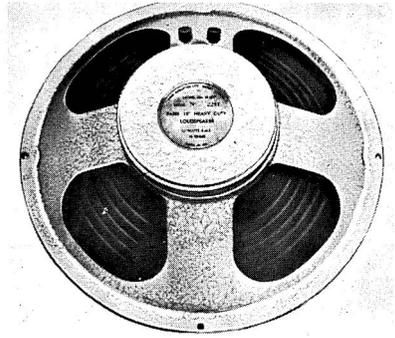
Similar to 101/10 but with 14,000 gauss magnet. Price: £9-40 (plus £2-27 PT).

**101/14a**

Similar to 101/14 but with twin cone, aluminium voice coil and FR: 40Hz-15kHz. Price: £12-55 (plus £3-03 PT).

**122/10**

12in ceramic magnet unit with 2in diameter voice coil. HC: 20W RMS. vci: 15 ohms. Main resonance 40Hz or 70Hz as required. FR: 30Hz-



Fane model 152/17

5kHz. Gap flux 10,000 gauss. Total flux 100,000 maxwells. Copper voice coil. Single cone. Price: £7-31.

**122/10a**

Similar to 122/10 but with twin cone, aluminium voice coil and FR: 30Hz-15kHz. Price: £10-46.

**122/12**

Similar to 122/10 but with 12,000 gauss magnet. Price: £9-56.

**122/12a**

Similar to 122/12 but with twin cone, aluminium voice coil and FR: 30Hz-15kHz. Price: £12-71

**122/14**

Similar to 122/10 but with 14,000 gauss magnet and HC: 22W. Price: £12.

**122/14a**

Similar to 122/14 but with twin cone, aluminium voice coil and FR: 30Hz-15kHz. Price: £15-15.

**122/17**

Similar to 122/10 but with 17,000 gauss magnet, 25W handling capacity and FR: 25Hz-6kHz. Price: £14-55.

**122/17a**

Similar to 122/17 but with twin cone, aluminium voice coil and FR: 30Hz-17kHz. Price: £17-70.

**152/12**

15in ceramic magnet unit with 2in diameter voice coil. HC: 25W RMS. vci: 15 ohms. Main resonance 32Hz. Gap flux 12,000 gauss. Total flux 160,000 maxwells. Copper voice coil. Single cone. FR: 25Hz-2-5kHz. Price: £15-36.

**152/12a**

Similar to 152/12 but with twin cone, aluminium voice coil and FR: 30Hz-15kHz. Price: £18-51.

**152/14**

Similar to 152/12 but with 14,000 gauss magnet, HC: 27W and FR: 25 Hz-3-5kHz. Price: £17-70.

**152/17 ★**

Similar to 152/12 but with 17,000 gauss magnet.

★ Indicates entry is illustrated

HC: 30W RMS and FR: 25Hz-4kHz. Price: £21-20.

### 152/17a

Similar to 152/17 but with aluminium voice coil, twin cone and FR: 30Hz-17kHz. Price: £24-35.

### 153

15in extra heavy duty unit with ceramic magnet and 3in diameter voice coil. Gap flux 14,500 gauss. Total flux 375,000 maxwells. HC: 40W RMS. Copper voice coil. Single cone. FR: 30 Hz-3.5kHz. vci: 15 ohms. Main resonance 40Hz. Weight: 20lb. Price: £23-38.

### 183

18in extra heavy duty unit with ceramic magnet and 3in diameter voice coil. Gap flux 14,500 gauss. Total flux 375,000 maxwells. HC: 60W. Copper voice coil. Single cone. FR: 20Hz-3kHz. vci: 15 ohms. Main resonance 30Hz. Weight: 22lb. Price: £28.

### 303

3in tweeter unit.  $\frac{3}{4}$ in pole. Price: £2-50.

### 501

5in mid-range unit. Gap flux 15,000 gauss. Total flux 60,000 maxwells. HC: 20W. 1in diameter aluminium voice coil. vci: 15 ohms. Rigid cone with neoprene surround. FR: 400Hz-5kHz. rcf 800Hz and 3-5kHz. Price: £5-80 (plus £1-40 PT).

### 505

Similar to 501 but with 11,000 gauss magnet and HC: 15W. Price: £4-20 (plus £1-01 PT).

### 502

5in full-range unit for small enclosures. Gap flux 15,000 gauss. Total flux 60,000 maxwells. HC: 8W. 1in copper voice coil. Price: £5-80 (plus £1-40 PT).

### 506

Similar to 502 but with 11,000 gauss magnet and HC: 7W. Price: £4-20 (plus £1-01 PT).

### 801

8in full-range unit. 1in pole piece with 15,000 gauss magnet. Twin cone. Aluminium voice coil. Resonance 25Hz. Response up to 15kHz. Price: £6-21 (plus £1-50 PT).

### 802

8in unit similar to 801 but with single cone and copper voice coil. Resonance 70Hz. Response up to 10kHz. Price: £5-67 (plus £1-37 PT).

### 805

8in unit similar to 801 but with 11,000 gauss magnet. Price: £5 (plus £1-21 PT).

### 806

8in unit similar to 802 but with 11,000 gauss magnet. Price: £4-52 (plus £1-09 PT).

### 1001

10in full-range unit. 1in dia pole piece with 15,000 gauss magnet. Twin cone. Aluminium

voice coil. Resonance 22Hz. Response up to 15 kHz. HC: 10W. Price: £7-02 (plus £1-70 PT).

### 1002

10in unit similar to 1001 but with single cone and copper voice coil. Resonance 60Hz. Response up to 10kHz. Price: £6-45 (plus £1-56 PT).

### 1005

10in unit similar to 1001 but with 11,000 gauss magnet. Price: £5-92 (plus £1-43 PT).

### 1006

10in unit similar to 1002 but with 11,000 gauss magnet. Price: £5-38 (plus £1-30 PT).

### 138/11

13 × 8in elliptical. 11,000 gauss ceramic magnet. 1in voice coil. Impedance: 15 ohms. HC: 15W. FR: 30Hz-15kHz. Price: £5-46.

### 138/15

13 × 8in elliptical. Similar specification to 138/11 but with 15,000 gauss magnet. FR: 30Hz-16 kHz. Price: £6-93.

Special low resonance versions of 10in, 12in, 15in and 18in speakers are available at slightly higher prices. These are intended for use as bass units in hi-fi multiple systems. They have rigid moulded fibre cones with rubber surround allowing free axial movement. Must be used in suitable reflex or infinite baffle cabinets. Not recommended for use with electric guitars or with small open baffles.

Also available are special 'Pop' versions of 10in, 12in, 15in, 18in speakers. Designed for vocal and instrumental reproduction, and public address systems. Details on application.

## ■ GOODMAN LOUDSPEAKERS LTD

Downley Road, Havant,

Hampshire, PO9 2NL.

Tel: Havant 6344. Telex: 86296.

### Axiette 8 ★

8in. Paper cone. Plastic treated surround. Voice coil 1in. Gap flux 13,500 gauss. Total flux 53,000 maxwells. HC: 6W. vci: 15 or 8 ohms. FR: 40 Hz-15kHz. Price: £8-10 (inc. PT).

### Twin Axiette 8 ★

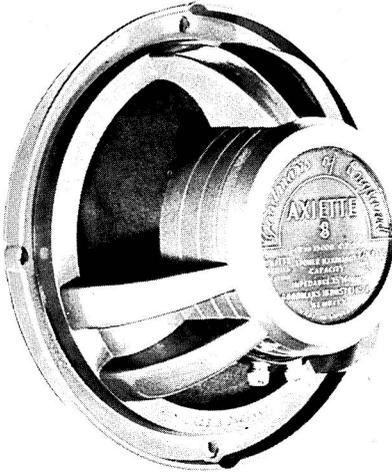
8in twin cone version. FR: 40Hz-18kHz. Mechanical crossover at 2kHz. Other details as for Axiette 8. Price: £9-17 (inc. PT).

### Axiom 10

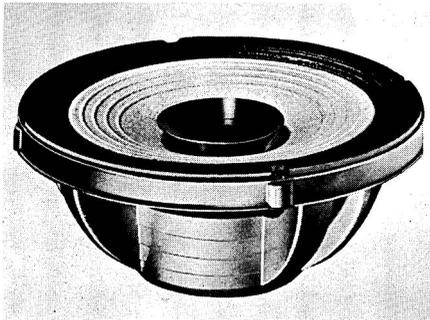
10in. Paper cone. Plastic treated surround. Voice coil 1in. Gap flux 13,500 gauss. Total flux 53,000 maxwells. HC: 10W. vci: 15 or 8 ohms. FR: 40Hz-15kHz. Price: £9-60 (inc. PT).

### Twin Axiom 10

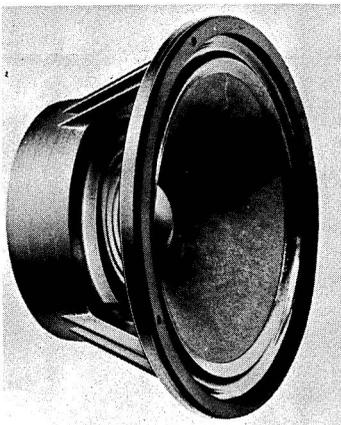
Full-range 10in unit. Paper cone. Latex coated paper surround. Voice coil 1in diameter (cop-



*Goodmans Axiette 8*



*Goodmans Twin Axiette 8*



*Goodmans Audiom 51 bass*

per). Impedance: 8 or 15 ohms. Gap flux 13,500 gauss. Total flux 53,000 maxwells. HC: 10W RMS. FR: 40Hz-18kHz. Price: £10-23 (inc. PT).

**Axiom 201**

12in. Twin diaphragm paper cone with pure plastic roll suspension. Voice coil 1½in (4.4cm) (aluminium). vci: 15-16 or 8 ohms. Gap flux 13,000 gauss. Total flux 87,500 maxwells, HC: 15W. FR: 30Hz-16kHz. Built-in mechanical crossover at 5kHz. Price: £14-45.

**Axiom 301**

12in twin diaphragm paper cone with pure plastic roll suspension. Voice coil 1½in (4.4cm) (aluminium). vci: 15-16 or 8 ohms. Gap flux 16,500 gauss. Total flux 185,000 maxwells. HC: 20W. FR: 30Hz-16kHz. Built-in mechanical crossover at 5kHz. Price: £20-70.

**Trebax 100**

Horn-loaded pressure tweeter. Aluminium diaphragm. Voice coil 1in. HC suitable for inclusion in systems of up to 25W. vci: 15 ohms at 10kHz. FR: 2-5kHz-20kHz rcf 5kHz. Price: £8-60.

**Trebax 5K/20XL**

Horn loaded pressure tweeter. Built-in L/C crossover (5kHz) and attenuator. Suitable for inclusion in systems of up to 20W. Dispersion angle 90°. Price: £9-70.

**Midax 650**

Horn loaded pressure unit. Resin impregnated linen diaphragm. Diecast horn. Voice coil 1½in. HC suitable for systems up to 25W. vci: 15 ohms. FR: 650Hz-8kHz. rcf, 5kHz. Price: £12-95.

**Audiom 51 bass ★**

12in. Paper cone. Voice coil 1½in (4.4cm). vci: 15-16 or 8 ohms. Gap flux 13,000 gauss. Total flux 87,500 maxwells. HC 15W. Fundamental resonance 35Hz. Price £13-05.

The Audiom 51 is available in two versions: Audiom 51 bass—details as above, for use as bass unit in high fidelity systems. Audiom 51 Standard (50Hz) for PA, guitars and all arduous conditions. Same price as above.

**Audiom 61 bass**

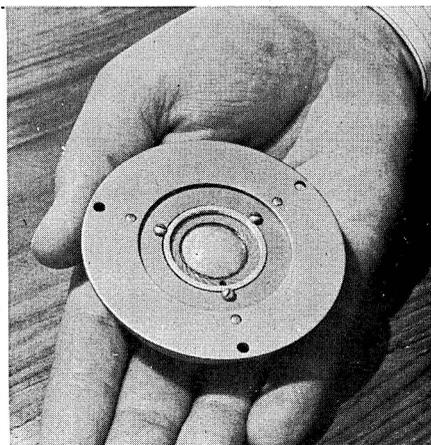
12in. Paper cone. Voice coil 1½in (4.4cm). vci: 15-16 ohms. Gap flux 16,500 gauss. Total flux 185,000 maxwells. HC 20W. Fundamental resonance 35Hz. Price: £18-95.

The Audiom 61 is available in two versions: Audiom 61 bass—details as above, for use as bass unit in high fidelity systems. Audiom 61 Standard (50Hz) for PA, guitars and all arduous conditions. Same price as above.

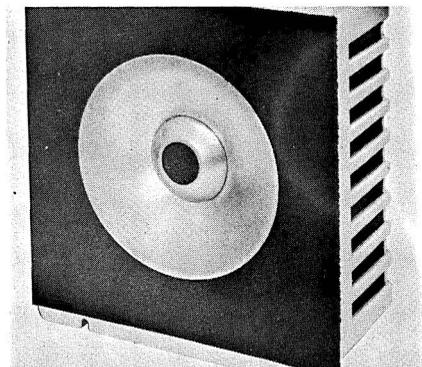
**Audiom 81 bass**

15in. Paper cone. Pure plastic roll suspension.

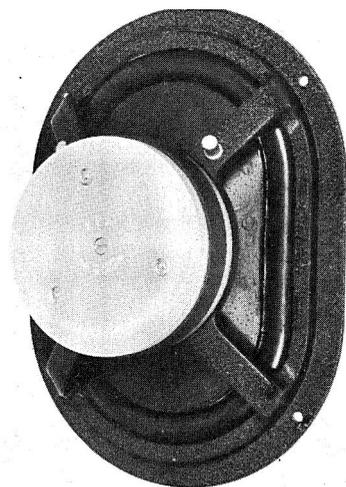
★ Indicates entry is illustrated



ITT 4001 HF unit



Jordan-Watts speaker drive module



KEF B139

Voice coil 3in (7.6cm). vci: 15-16 ohms. Gap flux 14,000 gauss. Total flux 269,000 maxwells. HC: 25W. Fundamental resonance 30Hz. Price: £31.90.

The Audiom 81 is also available in 60Hz version for special purposes.

The Audiom 81 bass (details above) with 30Hz fundamental-resonance is specially designed for use as the bass unit in a multiple system (with Midax and Trebax). In this case it must be mounted in the correct size of enclosure.

**Audiom 8P**

8in heavy duty. HC: 15W. Impedance: 8 or 15 ohms. Price: £5.55.

**Audiom 10P**

10in heavy duty. HC: 15W. Impedance: 8 or 15 ohms. Price: £6.05.

**Audiom 12P**

12in heavy duty. HC: 50W. Impedance: 8 or 15 ohms. Price: £12.37.

**Audiom 15P**

15in heavy duty. HC: 50W. Impedance: 8 or 15 ohms. Price: £20.

**Audiom 18P**

18in. Voice coil diameter: 3in. vci: 8 or 15 ohms. HC: 100W. Fundamental resonance: 45Hz. Flux density: 13,500 gauss. Baffle hole diameter: 16½ in. Depth 8½ in. Weight 26lb. Recommended sealed enclosure (per speaker): 7,000 cu. in. Price: £34 (no PT).

■ **ITT-STC**

ITT Component Group Europe, Standard Telephones & Cables Ltd, Electro-Mechanical Product Division, West Road, Harlow, Essex. Tel: Harlow 26811.

**Type 4001G, High Frequency Unit ★**

High frequency pressure unit. FR: 6kHz-20kHz. Substantially omni-directional. vci: 15 ohms Flux density: 14,000 gauss. Size: approximately 2½ × 1in. Price on request.

■ **JORDAN-WATTS**

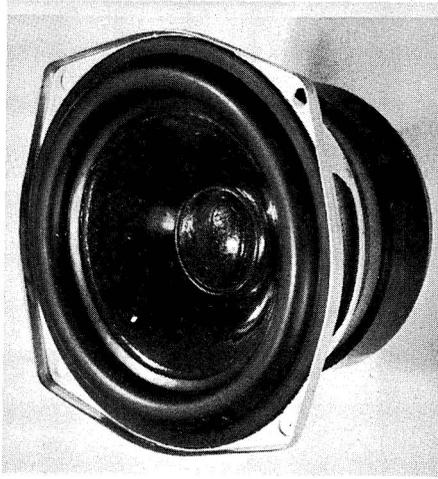
Distributors: Boosey & Hawkes (Sales) Ltd, Sonorous Works, Deansbrook Road, Edgware, Middlesex. Tel: 01-952 7711.

**Jordan-Watts Module Mk 11 ★**

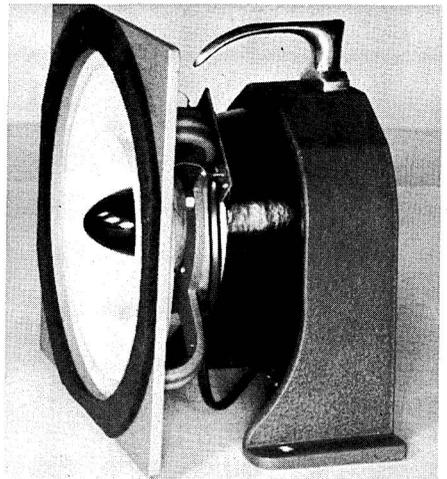
6in square frame. Aluminium diaphragm with plastic surround. Voice coil 1½ in. Ceramic magnet. vci: 3-5 ohms and 7½-16 ohms. HC: 12W. FR: 25Hz-20kHz. Price: £11.

■ **KEF ELECTRONICS LTD**

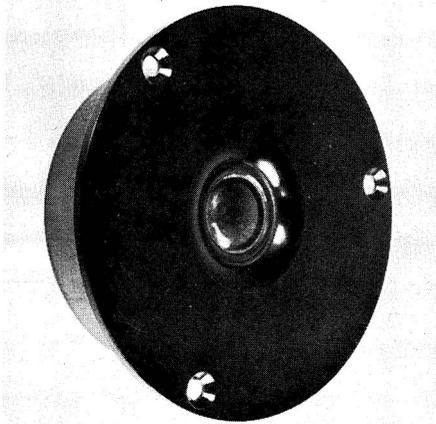
Tovil, Maidstone, Kent. Tel: Maidstone 57258. Cables: KEF, Maidstone.



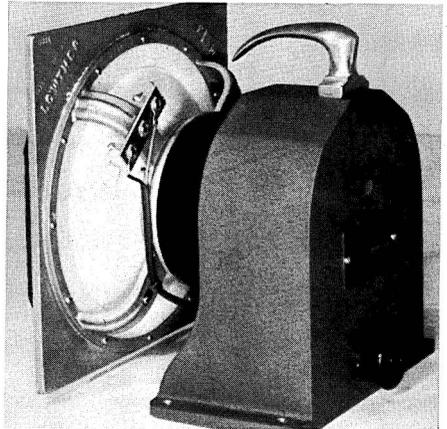
KEF B110



Lowther PM2 Mk 1



KEF T27



Lowther PM4

**B139 ★**

13 × 9½ × 3in. 10lb. HC 30W. Resonance 20Hz. Impedance 8 ohms. FR: 20-1000Hz. Price: £12-50.

**B200**

8½ dia × 4in. 3¾lb. HC 25W. Resonance 25Hz. Impedance 8 ohms. FR: 25-3500Hz. Price: £7-50 (plus £1-83PT).

**B110 ★**

5½in dia × 3½in. 3-6lb. HC 15W. Resonance 30 Hz. Impedance 8 ohms. FR: 30-5000Hz. Price: £6-50 (plus £1-59 PT).

**T15**

3¾in dia × 1¾in. 2lb. HC 6W. Resonance 550Hz. Impedance 8 ohms. FR: 800Hz-20kHz. Price: £6.

**T27 ★**

4½in dia × 1¾in. 1-4lb. HC 6W. Resonance 900 Hz. Impedance 8 ohms. FR: 3-30kHz. Price: £5. See also entry in Constructional Kits section.

**LOWTHER MANUFACTURING CO**

Lowther House, St Mark's Road, Bromley, Kent, BR29HQ.

Tel: 01-460 5225. Cables: Lowther, Bromley.

**P.M.2 Mk I ★**

6in. Selected paper cone. Roll foam rubber surround. Voice coil 39mm. Gap flux 21,000 lines per sq cm. Total flux 281,000 maxwells. HC: 6W; 20W programme material. vci: 15 ohms. FR: 30Hz-20kHz. Price: £35.

★ Indicates entry is illustrated

### **P.M.2 Mk II**

6in. Selected paper cone. Roll foam rubber surround. Voice coil 39mm. Gap flux 23,000 gauss. Total flux 350,000 maxwells. HC: 6W; 20W programme material. vci: 15 ohms. FR: 25Hz-22kHz. Price: £50.

### **P.M.4 ★**

6in. Selected paper cone. Roll foam rubber surround. Voice coil 37mm. Gap flux 24,000 gauss. Total flux 385,000 maxwells. HC: 6W; 20W programme material. vci: 16 ohms. FR: 25Hz-24kHz. Price: £65.

### **P.M.6**

6in. Selected paper cone. Roll foam rubber surround. Voice coil 39mm. Gap Flux 17,500 gauss. Total flux 196,000 maxwells. HC: 6W; 20W programme material. vci: 16 ohms. FR: 30Hz-20kHz. Price: £22.50.

### **P.M.6 Mk I**

P.M.6 magnet assembly with a new diaphragm assembly: Lowther Special Silver speech coil, roll surround and back centring providing an improved performance. P.M.6 will still be available as a replacement unit. Price: £25.

### **P.M.7 ★**

6in. Selected paper cone. Roll foam rubber surround. Voice coil 39mm. Gap flux 19,650 gauss. Total flux 250,000 maxwells. HC: 6W; 20W programme material. vci: 16 ohms. FR: 30Hz-20kHz. Price: £35.

Full stabiliser for any of Lowther drive units. Price: £2.

## **■ KEITH MONKS (AUDIO) LTD**

5 Fleet Road, Fleet, near Aldershot, Hants.  
Tel: Fleet 7316.

### **Hypertone ★**

Titanium cone speaker module. 6in titanium piston with cantilever suspension. 1½in dia voice coil. Total flux 160,000 maxwells. Mean hemispherical power response substantially level to 15kHz. vci: 8 or 15 ohms at 400Hz. HC 15W RMS at and above the lower system limit (dependent upon loading conditions), 30W music rating, i.e. under normal use. Price: £19.50.

## **■ PEERLESS**

Distributor: P. F. & A. R. Helme Ltd, Summerbridge, Harrogate, HG34DR, Yorks.  
Tel: Darley 279.

All units are 8 ohms impedance, but some tweeters have 16 ohm alternatives.

### **MT 20 HFC**

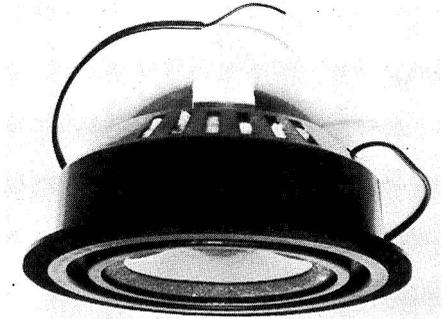
Tweeter, 2×2in. HC 5W. FR: 2.5-18kHz. Price: £1.50 (plus 37p PT).

### **MT 225 HFC**

Tweeter, 2¼×2¼in. vci: 16 ohms. HC 5W. FR:



*Lowther PM7 Drive Unit*



*Keith Monks Hypertone*

1.5-20kHz. Price: £1.55 (plus 38p PT).

### **MT 25 HFC**

Tweeter, 2½×2½in. vci: 16 ohms. HC 5W. FR: 1.5-18kHz. Price: £1.54 (plus 38p PT).

### **0525 WL**

Woofer. 5in. HC 10W. Maxwells: 54,000. Resonant frequency: 40Hz. Price: £4.50 (plus £1.10 PT).

### **B 65 WG**

Woofer, 6½in. HC 10W. Maxwells: 54,000. Resonant frequency: 50Hz. Price: £4.30 (plus £1.05 PT).

### **610 W**

Woofer. 10×6in. HC 10W. Maxwells: 54,000. Resonant frequency: 40Hz. Price: £3.20 (plus 78p PT).

### **P 825 W**

Woofer, 8in. HC 12W. Maxwells: 90,000. Resonant frequency: 45Hz. Price: £5.40 (plus £1.32 PT).

**L 825 WG**

Woofer, 8in. HC 50W. Maxwells: 64,000. Resonant frequency: 25Hz. Price: £6 (plus £1.46 PT).

**L 100 WG**

Woofer, 10in. HC 50W. Maxwells: 64,000. Resonant frequency: 20Hz. Price: £7 (plus £1.71 PT).

**CM 120 W**

Woofer, 12in. HC 12W. Maxwells: 90,000. Resonant frequency: 35Hz. Price: £6.40 (no PT).

**D 120 WL(Sp)**

Woofer, 12in. HC 40W. Maxwells: 115,000. Resonant frequency: 25Hz. Price: £11 (no PT).

**D 150 WL(Sp)**

Woofer, 15in. HC 50W. Maxwells: 115,000. Resonant frequency: 20Hz. Price: £20.25

**GT 50 MRC**

Mid-range unit. 5in. dia. HC 6W. FR: 800Hz-7kHz. Maxwells: 21,500. Price: £2.15 (plus 52p PT).

**G 50 MRC**

Mid-range unit. 5in dia. HC 10W. FR: 750 Hz-6kHz. Maxwells: 42,000. Price: £3.20 (plus 78p PT).

**0570 MRC (4 ohms only)**

Mid-range unit. 5 × 7in. HC 20W. FR: 250Hz-4.5kHz. Maxwells: 54,000. Price: £5.75 (plus £1.40 PT).

**E.396 M**

Full-range 6 × 4in unit. Price: £2.60 (plus 63p PT).

**E.396 M (special)**

Full-range 6 × 4in unit. Price: £3.85 (plus 94p PT).

**E.460 (special)**

Full-range 6 × 4in unit. Price: £2 (plus 49p PT).

**B 65 FM**

Full-range. 6½in. HC 6W. FR: 35Hz-15kHz. Maxwells: 57,000. Price: £3.55 (plus 87p PT).

**610 FM**

Full-range. 6½ × 10½in. HC 6W. FR: 35Hz-15 kHz. Maxwells: 57,000. Price: £3.80 (plus 93p PT).

**P 825 FM**

Full-range. 8½in. HC 10W. FR: 30Hz-16kHz. Maxwells: 90,000. Price: £6.20 (plus £1.51 PT).

**CM 120 FM**

Full-range. 12in. HC 12W. FR: 30Hz-14kHz. Maxwells: 57,000. Price: £4.95 (no PT).

**D 120 FM**

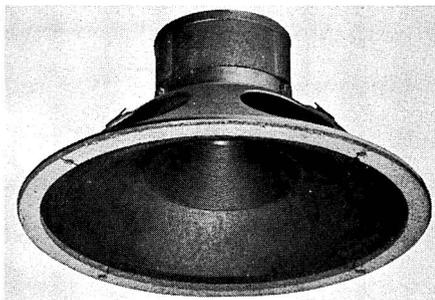
Full range. 12in. HC 12W. FR: 30Hz-14kHz. Maxwells: 115,000. Price: £9.75 (no PT).

**Coax 825-20**

Full range 8½in. HC: 12W., FR: 30Hz-18kHz.



Philips 9710M



Philips 9710M

Maxwells: woofer 90,000; tweeter 12,000. Price: £10.75 (plus £2.62 PT).

**Coax 120-20-20**

Full-range 12in unit. HC: 12W RMS. FR: 25Hz-18kHz. Maxwells: (bass unit) 90,000; (two tweeters) 12,000 each. Price: £14.75 (no PT).

■ **PHILIPS ELECTRICAL LTD**

Century House, Shaftesbury Avenue, London, WC2.

Tel: 01-437 7777. Cables: Phillamps, London.

9710M ★

8in. Dual cone. Paper corrugated surround. Voice coil 1in. Gap flux 8,000 gauss. Total flux 97,600 maxwells. HC: 10W RMS. vci: 7 ohms. FR: 40Hz-19kHz. Price: £6.04 (inc. PT).

■ **ROLA-CELESTION** See Celestion.

■ **STENTORIAN**

Whiteley Electrical Radio Co. Ltd, Victoria Street, Mansfield, Notts. Tel: Mansfield 24763.

**Stentorian HF.812**

8in. Composite (paper and cambric) cone. Cambric surround. Voice coil 1in. Gap flux

★ Indicates entry is illustrated

12,000 gauss. Total flux 47,400 maxwells. HC 5W. vci: universal (3, 7.5 and 15 ohms). FR: 50Hz-12kHz. Price: £5.30 (plus £1.31 PT).

**H.F.816**

8in. Composite (paper and cambric) cone. Cambric surround. Voice coil lin. Gap flux 16,000 gauss. Total flux 63,000 maxwells. HC 6W. vci: universal 3, 7.5 and 15 ohms. FR: 50Hz-14kHz. Price: £8.72 (plus £2.15 PT).

**H.F.912/67**

9in die cast. Speech coil: aluminium. Pole dia lin. Magnet system: 1.2 Webers/m<sup>2</sup>. vci: 15 ohms. HC 10W. Price: £6.61 (plus £1.63 PT).

**H.F. 1012**

10in. Composite (paper and cambric) cone. Cambric surround. Voice coil lin. Gap flux 12,000 gauss. Total flux 47,400 maxwells. HC 10W. vci: universal 3, 7.5 and 15 ohms. FR: 30Hz-14kHz. Price: £6.37 (plus £1.58 PT).

**H.F. 1016**

10in. Composite (paper and cambric) cone. Cambric surround. Voice coil lin. Gap flux 16,000 gauss. Total flux 63,000 maxwells, HC 10W. vci: 3, 7.5 and 15 ohms. FR: 30Hz-15kHz. Price: £10.17 (plus £2.51 PT).

**H.F. 1214**

12in. Composite (paper and cambric) cone. Cambric surround. Voice coil 1.5in. Gap flux 14,000 gauss. Total flux 106,000 maxwells. HC 15W. vci: 15 ohms. FR: 25Hz-14kHz. Price: £17.43.

**H.F. 1214/67**

12in bass loudspeaker. Speech coil: copper. Pole dia: 1½in. Magnet system: 1.4 Webers/m<sup>2</sup>. vci: 15 ohms. Price: £19.29.

**H.F. 1216**

Composite (paper and cambric) cone. Cambric surround. Voice coil 1½in. Gap flux 16,000 gauss. HC 15W. FR: 20Hz-16kHz. Price: £26.72.

**T.359**

3½in. Paper cone and surround. Voice coil 0.635 in. Gap flux 9,000 gauss. Total flux 14,900 maxwells. HC 15W with crossover. vci: 5 or 15 ohms. FR: 3-17kHz. rcf 3kHz. Price: £2.23 (plus 55p PT).

**T812/67**

8in middle and high frequency loudspeaker. Speech coil: aluminium. Pole dia: 1in. Magnet system: 1.2 Webers/m<sup>2</sup>. vci: 15 ohms. ¼ section crossover unit 1kHz. Price: £6.32 (plus £1.56 PT).

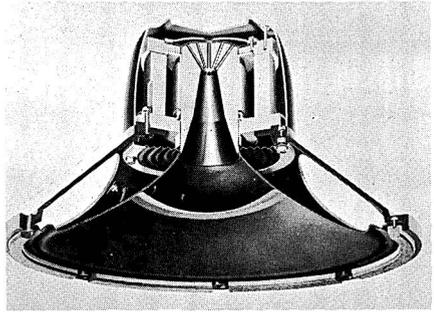
■ **TANNOY PRODUCTS LTD**

West Norwood, London, SE27.

Tel: 01-670 1131. Cables: Tannoy, London.

**Direct radiator**

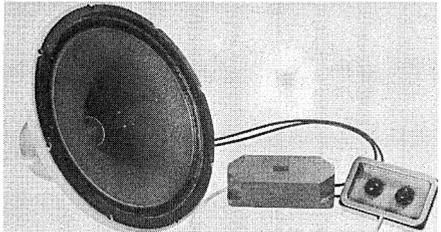
12in. Moulded fibre cone. Plastic treated sur-



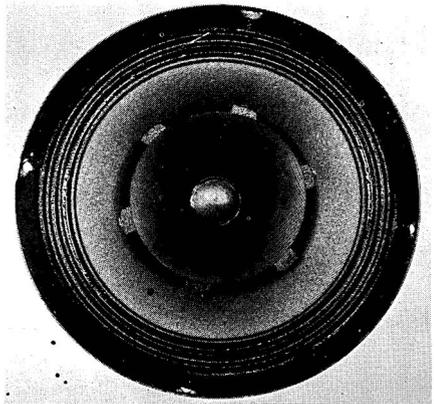
*Tannoy Monitor Gold 111LZ*



*Tannoy Monitor Gold "Twelve"*



*Tannoy Monitor Gold "Fifteen"*



*Tripletone Twin Cone 8 or 10in Mk II*

round. Voice coil 2in. Gap flux 14,000 gauss. HC 15W. vci: 20 ohms. FR: 40Hz-16kHz. Price: £19-20 (to special order).

**Monitor Gold III LZ ★**

12in dual concentric. Moulded fibre cone. Plastic impregnated surround. Gap flux (LF) 10,000 (HF) 15,000 gauss. HC 10W. FR: 23Hz-20kHz, recommended crossover (supplied) 1kHz. vci: 15 ohms. Price: £31.

**Monitor Gold 'Twelve' ★**

12in. Moulded fibre cone. Plastic treated surround. Voice coils (HF and LF) 2in. Gap flux (LF) 11,500 (HF) 15,000 gauss. HC 30W. FR: 25Hz-20kHz, recommended crossover (supplied) 1kHz. Price: £36-50.

**Monitor Gold 'Fifteen' ★**

15in. Moulded fibre cone. Plastic treated surround. Voice coils (HF and LF) 2in. Gap flux (LF) 13,500 (HF) 18,000 gauss. HC 50W. FR: 23Hz-20kHz, recommended crossover (supplied) 1kHz. Price: £43-25.

**■ TRIPLETONE MANUFACTURING CO LTD**

Factory No. 1, 138 Kingston Road, Wimbledon, London, SW19. Tel: 01-542 1189.

**Tripletone 8in Mk II ★**

Full-range hi-fi unit. 8in. vci: 2-3 ohms, 8 ohms or 15 ohms. Flux density 12,000 lines/sq cm. Bass resonance 60Hz. Twin cone. HC 6W RMS. FR: 30Hz-17kHz. Price: £4-50 (plus £1-23 PT).

**Tripletone 10in Mk II ★**

Full-range hi-fi unit. 10in. vci: 2-3 ohms or 15 ohms. Flux density 12,000 lines/sq cm. Bass resonance 55Hz. Twin cone. HC 8W RMS. FR: 30Hz-17kHz. Price: £4-88 (plus £1-34 PT).

**■ VITAVOX LTD**

Westmoreland Road, London, NW99RJ. Tel: 01-204 4234. Cables: Vitavox, London.

**Duplex coaxial DU121**

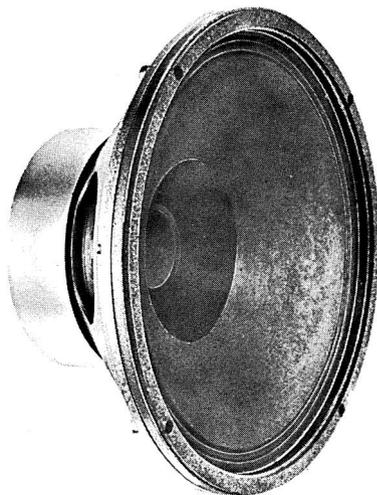
12in paper cone. Plastic treated paper surround. 3in polyester film cone and surround. Voice coil (LF) 1-78in (HF) 0-65in. Gap flux (LF) 16,000 gauss. (HF) 12,000 gauss. Total flux (LF) 180,000 maxwells, (HF) 15,000 maxwells. HC 15W. vci: 15 ohms. FR: 30Hz-15kHz. Replaceable cone. Price: £43.

**AK123 Heavy Duty**

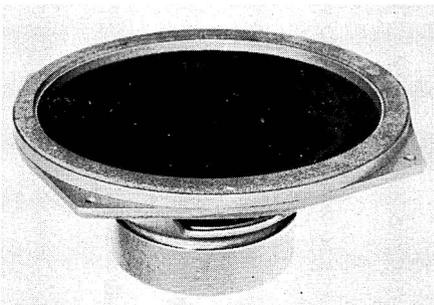
12in paper cone. Paper surround. Voice coil 1-78in. Gap flux 16,000 gauss. Total flux 180,000 maxwells. HC 20W. vci: 15 ohms. FR: 50Hz-8 kHz. Replaceable cone. Price: £29-90.

**AK124 ★**

12in paper cone. Paper surround. Voice coil 1-78in. Gap flux 16,000 gauss. Total flux 180,000 maxwells. HC 15W. vci: 15 ohms. FR: 30Hz-13kHz. Replaceable cone. Price: £29-90.



Vitavox AK124



Vitavox AK154

**Cone Kit**

Spare cone kit AK123, DU121, AK124. Price: £6.

**AK154 ★**

15in paper cone. Treated paper surround. Bass resonance 30-35Hz. Voice coil 2-25in. Gap flux 14,000 gauss. Total flux 260,000 maxwells. HC 25W nominal. FR: 30Hz-5kHz nominal. (HC and FR determined by enclosure.) vci: 15 ohms. Replaceable cone. Price: £46-90.

**AK155**

Driver for bass horn of dual channel system. 15in paper cone, paper surround. Bass resonance 40-50Hz. Voice coil 2½in. Gap flux 14,000 gauss. Total flux 260,000 maxwells. DC resistance of voice coil 5-5-6-5 ohms. HC and FR determined by associated horn characteristics. Replaceable cone. Price: £46-90.



Wharfedale Super 8/RS/DD

#### Cone Kit

Spare cone kit for AK154 and AK155. Price: £9.

#### S2 HF pressure unit

Diaphragm pressure-formed from lightweight aluminium alloy. Voice coil 3in diameter. vci: 15 ohms. Gap flux 16,000 gauss. Total flux 150,000 maxwells. HC above 200Hz 20W. Nominal FR: 200Hz-16kHz. Rec crossover 500 Hz. Price: £59-50.

#### High frequency horn

Designed for use with S2 pressure unit. Cast in aluminium alloy. Non-resonant. Cut-off frequency 300Hz. Price: £25-60.

#### GP1 pressure unit

Diaphragm pressure formed from lightweight aluminium alloy. Voice coil 1.96in diameter. Gap flux 15,000 gauss. Total flux 80,000 maxwells. HC above 200Hz 20W. Nominal FR: 200Hz-14kHz. vci: 15 ohms. Price: £21-60.

#### GP2 pressure unit

Diaphragm pressure formed from lightweight aluminium alloy. Voice coil 1.5in diameter. Gap flux 14,000 gauss. Total flux 40,000 maxwells. HC above 200Hz 15W. Nominal FR: 300Hz-10kHz. vci: 15 ohms. Price: £14-70.

#### GP2T pressure unit

Diaphragm pressure formed from lightweight aluminium alloy. Voice coil 1.5in diameter. Gap flux 14,000 gauss. Total flux 40,000 maxwells. HC above 200Hz up to 12W from built-in 100 V line transformer. Nominal FR: 300Hz-10kHz. Price: £22-75.

#### 1kHz horn

High frequency horn designed for use with the GP2 Series and GP1 pressure units. With directional swivel and simple two-point mounting. Price: £5-50.

#### ■ WHARFEDALE

Rank Wharfedale Ltd, Bradford Road, Idle, Bradford, Yorkshire.

Tel: Bradford 612552. Cables: Wharfedel, Idle, Bradford. Telex: 51407.

#### 8in Bronze/RS/DD

Full-range 8in unit. Paper cone with double diaphragm. Fabric roll surround. Voice coil 1in. (aluminium). vci: 8-15 ohms. Gap flux 10,500 gauss. Total flux 41,000 maxwells. HC: 4W RMS. FR: 50Hz-20kHz. Price: £4 (plus £1 PT).

#### Super 8/RS/DD ★

Full-range 8in unit. Paper cone with double diaphragm. Fabric roll surround. Voice coil 1in. (aluminium). vci: 8-15 ohms. Gap flux 14,500 gauss. Total flux 60,000 maxwells. HC 6W RMS. 12W peak. FR: 40Hz-20kHz. Price: £6-80 (plus £1-70 PT).

#### Super 10/RS/DD

Full-range 10in unit. Paper cone with double diaphragm. Fabric roll surround. Voice coil 1in. Gap flux 16,000 gauss. Total flux 85,000 maxwells. HC 10W RMS. vci: 8-15 ohms. FR: 30Hz-20kHz. Price: £11-20 (plus £2-80 PT).

#### Unit 3, Unit 4 and Unit 5

See Constructional Kits section.

#### ■ WHITELEY ELECTRICAL

See Stentorian.

#### ■ WOOLLETT AUDIOSTATICS

21 Anerley Station Road, London, SE20.

Tel: 01-778 9003.

#### 12in L.R.

Low resonance 12in dynamic unit. Paper cone with foam surround. HC 16W RMS. FR: 20 Hz-5kHz. Special unit for use with Woollett electrostatic treble speakers. Price: £12-75.

#### Type C

Constant charge push-pull electrostatic. Impedance 16 ohms. HC 20W RMS. FR: 1-6kHz-20kHz. Integral crossover. Attenuator, mains polariser. Rear sealed for mounting in bass cabinet behind horizontal  $9 \times 6\frac{1}{2}$ in aperture. Price: £19.

#### ■ YAMAHA

Distributors: Jonathan Fallowfield Ltd, 56-60 St John Street, London, EC1.

Tel: 01-253 7591.

For Yamaha speaker units mounted on open baffle cabinets see Speaker Enclosure section.

# Directory of Speaker Accessories

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ RICHARD ALLAN RADIO LTD

Bradford Road, Gomersal, Cleckheaton, Yorkshire.

Tel: Cleckheaton 2442/3.

Cables: Acoustics, Bradford.

### CN.54 Crossover Unit

Two-way quarter section. Recommended for use with CR5 bass unit and 460TC tweeter. Crossover frequency 5kHz. Impedance: 4-8 or 15 ohms. Price: £2-20.

### CN.104 Crossover Unit

A two-way half-section parallel network. Crossover frequency 5kHz. Impedance: 4-8 or 15 ohms. Price: £3-30.

### CN. 1284 Crossover Unit

A three-way crossover with main crossover operating from half wave parallel network and subsidiary crossover capacity fed. Crossover frequencies 1,100Hz and 5kHz. Impedance: 8 or 15 ohms. Price: £5.

### CN1584

Three-way half-section crossover network. Crossover frequencies: 350Hz and 8kHz. Impedance: 8 or 15 ohms. Price: £6-35.

## ■ BANG AND OLUFSEN UK LTD

Eastbrook Road, Gloucester, GL47DE.

Tel: Gloucester 21591.

### Beolab 6006 Spread Unit ★

Provides connection for a centre speaker from stereo amplifier. Connects between amplifier and speakers. Single control to vary the width of stereo effect. Can also be used as headphone output. Price: £8-50.

## ■ BLACK KNIGHT RUMBLECURE

Bank Top, Currier Lane, Ashton-under-Lyne, Lancs. Tel: 061-330 2836 (24-hour service).

Specialists in curing rumble due to acoustic feedback through floors and cabinets.

Kits and items designed to isolate and acoustically damp pickup arms, turntables, motor units,

plinth assemblies, tape recorders, speaker enclosures and other audio equipment.

Plinths fitted with Rumblecure equipment available. Details on request. Many standard items now available and more being added all the time. Quotations on receipt of full details of equipment.

## ■ CELESTION

Rola-Celestion Ltd, Ditton Works, Foxhall Road, Ipswich, Suffolk, IP38JP.

Tel: Ipswich 73131.

### CO3K crossover

Designed specially for use with Studio 12 and HF1300 Mk 2 units but equally suitable for use with any efficient bass and treble combination. Air-tight terminal assembly with flange mounting. Full half-section filter network. 12dB per octave cut-off at 3kHz. Size: 3 $\frac{7}{8}$ in long, 2 $\frac{7}{8}$ in diameter of body, 3 $\frac{3}{4}$ in diameter of flange. Price: £4-47.

## ■ EAGLE INTERNATIONAL

Heather Park Drive, Wembley, HAI 1SU.

Tel: 01-903 0144.

### CN.23 and CN.216

Two-way speaker cross-over networks. Crossover frequency 3kHz. CN.23, 3 ohms; CN.28, 8 ohms; CN.216, 16 ohms. Price: 95p.

### LS.2W ★

Stereo headphone control unit with provision for two sets of phones. A and B channel switching. Price: £3-45.

### JB3 ★

Stereo headphone and speaker switching and attenuation unit. Jack socket for phones. Switch permits phones only, speakers only, or both together. Moulded case with provision for screwing down. Price: £1-50.

## ■ EMI SOUND PRODUCTS LTD

Hayes, Middlesex.

Tel: 01-573 3888. Cables: Emi-sound, London.

### Crossover network 99970B

Combines any 3 ohm LF driver with two 15 ohm HF tweeters in parallel. Price on application.

### Crossover network 99970F

Combines any 15 ohm LF driver with two 8 ohm HF tweeters in series. Price on application.

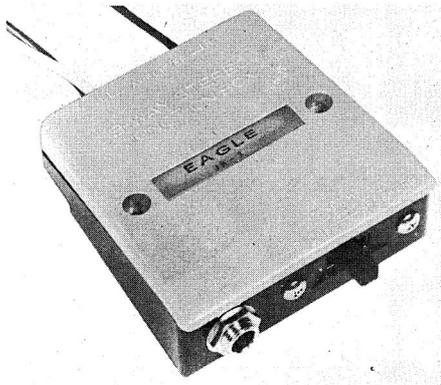
Networks available for all other speaker combinations. Separate chokes and capacitors for crossover networks. Prices and details on application.

## ■ FANE ACOUSTICS LTD

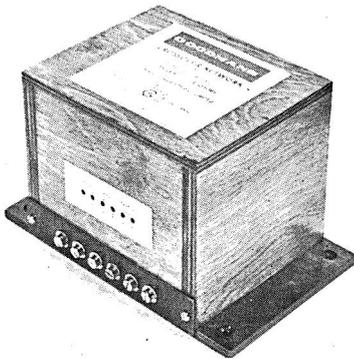
Hick Lane, Batley, Yorks.

Tel: Batley 6431. Cables: Fane, Batley.

★ Indicates entry is illustrated



Eagle JB3



Goodmans XO/950

#### Model 2X1

Crossover unit for two-speaker system. Crossover frequency 2kHz. 15 ohms. Cut-off 6dB/octave. Size:  $5\frac{3}{8} \times 3\frac{1}{4} \times 1\frac{1}{2}$ in. Price: £4.30.

#### Model 3X1

Crossover unit for three-speaker system. Crossover frequencies 800Hz and 3.5kHz. Impedance 15 ohms. Cut-off 6dB/octave. Size:  $5\frac{3}{8} \times 3\frac{1}{4} \times 2\frac{1}{2}$ in. Price: £5.40.

#### Model 3X2

Crossover for three-speaker system. Similar to one used in Ionofane 602 and 603. Crossover frequencies 800Hz and 3.5kHz. Matching impedance 15 ohms. Cut-off 12dB/octave. Size:  $6 \times 5\frac{1}{4} \times 2\frac{3}{4}$ in. Price: £6.70.

### GOODMANS LOUDSPEAKERS LTD

Downley Road, Havant, Hampshire, PO92NL. Tel: Havant 6344. Telex: 86296.

#### XO/5000-Crossover Unit

A two-way half-section crossover network,

operating at 5kHz. All terminations 15 ohms. Price: £2.65.

#### XO/950 Crossover Unit ★

A two-way half-section, crossover network, operating at 950Hz. All terminations 15 ohms. Price: £7.40.

#### XO/950/5000. Crossover Network

A multiple crossover network comprising four half-section LC filters. Crossover frequencies are 950Hz and 5kHz. All attenuation rates are 12dB/octave. All terminations 15 ohms. Price: £9.75.

#### Attenuator

12dB, eight steps. Price: £3.55.

#### ARU.172

For use with 12in range. Price: £4.50.

### HOWLAND-WEST LTD

2 Park End, South Hill Park, London, NW3.

Tel: 01-794 6666/6033.

#### Audio Switch Mk II ★

For installations with two sets of speakers, or where a headphone socket is not available. Facilities provide for both pairs of speakers to be operated at the same time or separately, or when the unit is switched to phones both sets of speakers are disconnected. Colour coded terminals at rear for connections. Teak finish. Size:  $6 \times 2\frac{7}{8} \times 3\frac{1}{2}$ in. Weight: 11lb. Price: £5.98.

#### De Luxe Audio Switch ★

Similar facilities as the Audio Switch Mk II, but with the additional feature of individual volume controls on both speakers of system B. This allows system A speakers to be controlled from the amplifier and system B from the unit. Teak finish. Size:  $6 \times 2\frac{7}{8} \times 3\frac{1}{2}$ in. Weight: 17oz. Price: £7.50.

#### Headphone control Mk II ★

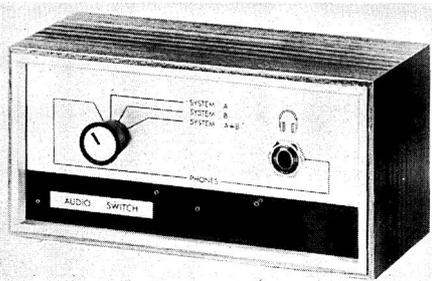
For operating two sets of stereo headphones simultaneously from the same source. Independent volume controls for each earpiece (four in all). On-off switch and jack sockets on front panel. Amplifier and speaker connections to colour coded terminals at rear. Teak finish. Size:  $6 \times 2\frac{7}{8} \times 3\frac{1}{2}$ in. Weight: 18oz. Price: £6.98.

#### Tri-channel control ★

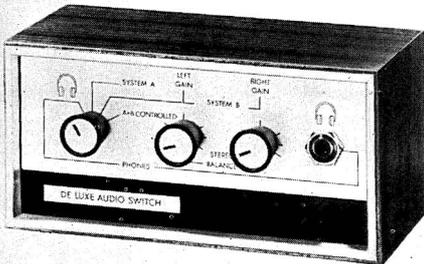
For use with three sets of speakers. Switch allows each pair of speakers to be selected independently, or all together. In the position where all three sets of speakers are on, the Tri-channel control permits the volume of each speaker to be adjusted independently. Finish: teak. Size:  $12 \times 3\frac{1}{4} \times 3\frac{1}{4}$ in. Weight: 34oz. Price: £14.75.

#### Input Comparator Mk II ★

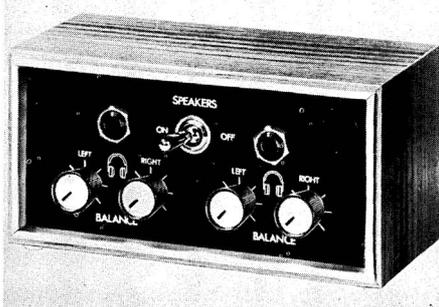
Enables any one of six stereo pick ups (or other programme sources) to be connected to any one of six stereo amplifiers, giving a range of 36 different combinations. Price: £12.75.



Howland-West Audio Switch Mk II



Howland-West De Luxe Audio switch



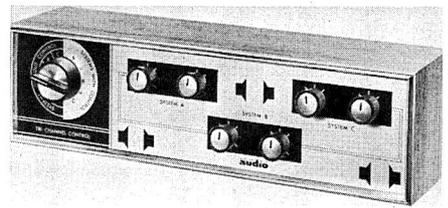
Howland-West Headphone control Mk II

**Multi-control Mk II ★**

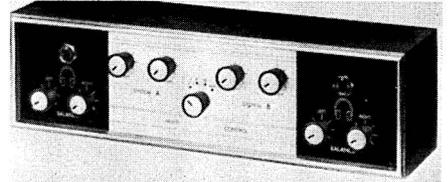
Versatile control unit which caters for almost all domestic listening requirements. Two pairs of stereo speakers may be connected, or one stereo pair and two independent single speakers. Independent volume controls on all four speakers. Two stereo phone sockets are fitted and when switched into circuit speakers are muted. Finish: teak. Size:  $12 \times 3\frac{1}{4} \times 3\frac{3}{8}$  in. Weight: 34oz. Price: £13-75.

**Output Comparator Mk II ★**

Allows any one of six stereo amplifiers to be connected to any of nine pairs of speakers, giving up to 54 different combinations. When used with Input Comparator a possible 324 equipment combinations are possible. Switch position 10 is for stereo headphones. Connections by DIN



Howland-West Tri-channel control



Howland-West Multi-control Mk II



Howland-West Output comparator



Howland-West Remote control

speaker plugs. Finish: teak. Size:  $12 \times 3\frac{1}{4} \times 3\frac{3}{8}$  in. Weight: 29oz. Price: £19.

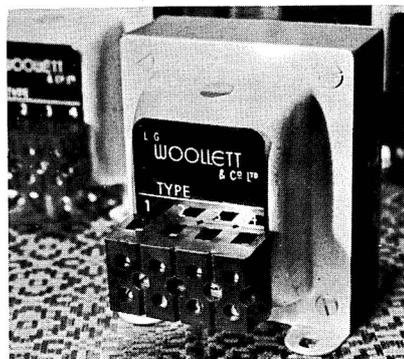
**Remote Control ★**

Supplied with 5 metres of cable. Enables volume of speakers to be controlled individually at this distance from the amplifier. Will also accept headphones which are also individually controlled. Ideal for balancing speakers from central position between speakers. Price: (provisional) £7-90.

■ **KOSS**

Tape Music Distributors Ltd, 11 Redvers Road, London, N.22.

Tel: 01-888 0152.



Woollett XS1 and XS2

#### T-5

Remote control station. Provides remote control of stereo phones and speakers. Jacks for two sets of phones. Volume controls for left and right channel also speaker on-off switch. Metal cabinet. Price: £5.

#### T-4

Junction box that accepts up to five sets of Koss stereophones. Supplied with 10ft cable and standard three-pole jackplug. Suitable for use in schools, libraries and in the home. Price: £4.50.

#### ■ MICRO-SEIKI

Distributors: B. H. Morris & Co (Radio) Ltd, 84-88 Nelson Street, London, E12DY. Tel: 01-790 4824.

#### MSB-1

Micro shock absorber. Microsorber employs air damped high efficiency materials to eliminate acoustic feedback from speaker enclosures to record playing deck (fitted under record deck). Adjustable for height to equalise for unbalanced weight of turntable. Price: (set of four) £4.95 (inc. PT).

#### ■ ROLA-CELESTION See Celestion.

#### ■ STENTORIAN

Whiteley Electrical Radio Co Ltd, Victoria Street, Mansfield, Notts. Tel: Mansfield 24762.

#### CX500 Crossover unit

A two-way half-section crossover network operating at 500Hz. All terminations 15 ohms. Price: £2.34.

#### CX1000 Crossover unit

As CX500, but operating at 1kHz. Price: £3.40.

#### CX1500 Crossover unit

As CX500, but operating at 1.5kHz. Price: £3.40.

#### CX3000 Crossover unit

As CX1500, but operating at 3kHz. Price: £2.69.

#### Constant impedance volume control

T-pad type attenuator having 10 steps of attenuation. Impedance presented by the load remains constant while the volume level is varied. In three versions for 3, 8 or 15 ohms. Price: £1.87.

#### ■ VITAVOX LTD

Westmoreland Road, London, NW99RJ. Tel: 01-204 4234. Cables: Vitavox, London.

#### CN370 Crossover

Half section. Crossover 500Hz. Attenuation 12dB/octave. All terminations 15 ohms. Balance control giving 0-8dB HF attenuation incorporated. Price: £15.30.

#### CN371 Crossover

Half-section. Crossover 1kHz. Attenuation 12dB/octave. All terminations 15 ohms. Balance control giving 0-8dB HF attenuation incorporated. Price: £11.85.

#### ■ WHITELEY ELECTRICAL

See Stentorian.

#### ■ WOOLLETT AUDIOSTATICS

21 Anerley Station Road, London, SE20. Tel: 01-778 9003.

#### XS1 ★

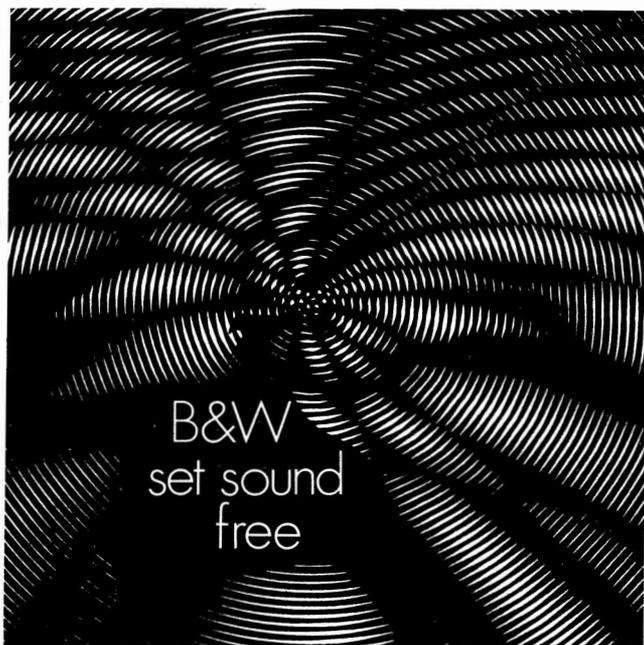
Speaker matching transformer. Converts 16 ohms to 8 ohms, and 8 ohms to 4 ohms. Bifilar wound. Grain orientated laminations. Ratio 1:0.707 auto. FR: 16Hz-30kHz  $\pm$  0.6dB. Price: £3.50.

#### XS2 ★

Speaker isolating and matching transformer. Converts 16 ohms to 4 ohms. Bifilar wound. Grain orientated laminations. Ratio 1:1 double wound. FR: 16Hz-100kHz  $\pm$  0.6dB. May be used to attenuate -6dB and -12dB while maintaining heavy damping on speaker and offering correct load to amplifier. Suitable for operating stereo system comprising two electrostatic high-frequency units with common bass speaker. *Note:* Not suitable for mains isolation in live chassis equipment. Price: £3.50.

#### Headphone Equaliser blender

Stereo. Provides variable attenuation and adjustable treble lift. Switch positions for: headphones only, headphones and speakers, or speakers only. Variable negative blend cancels out crosstalk and permits compatible stereo records to be played as full stereo. Two input and two output blocks for easy connection into speaker feeds. Fitted with two yards cable for inputs and speaker feeds: Size: 6  $\times$  5  $\frac{1}{2}$   $\times$  2  $\frac{1}{2}$  in. Price: £12.80.

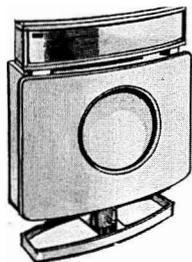


B&W  
set sound  
free

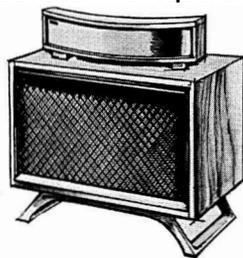
*'I wouldn't care if it were  
sky-blue pink for the sake  
of the good sound it makes'*

H. W. Hellyer, Popular Hi-Fi – talking about the B&W DM1

**The DM3 and model 70  
are received with equal enthusiasm.**



**Model 70 Continental**  
export only



**Standard**



**DM3**



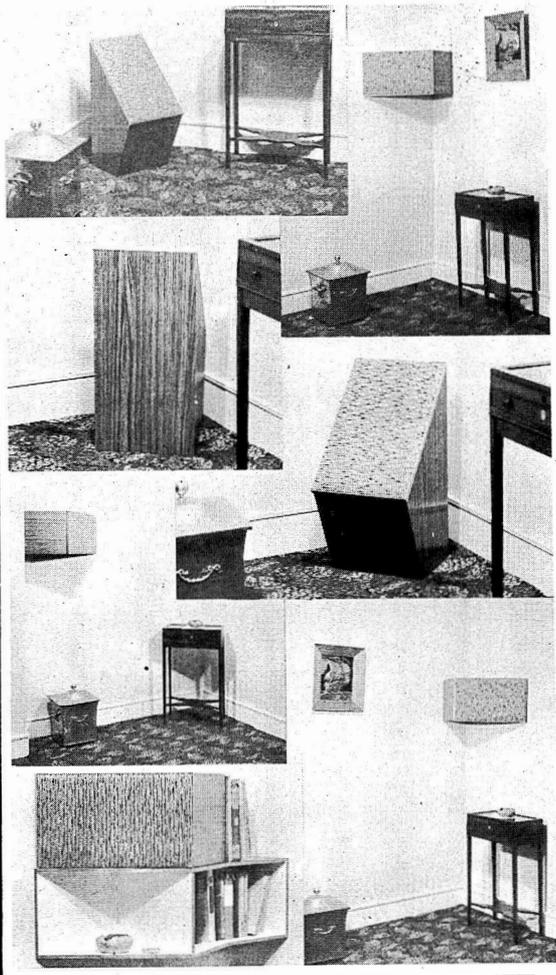
**DM1**

Write for brochure

**B&W electronics**

Littlehampton Road · Worthing · Sussex  
Tel. 66830 Grams 'Monex' Worthing

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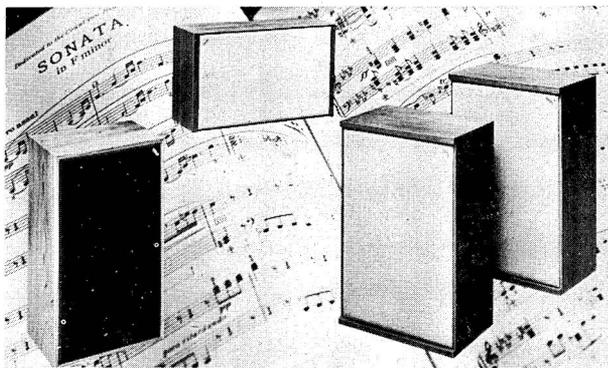
**ON AN ORIGINAL THEME**

**BY THE MOST VERSATILE HI-FI  
LOUDSPEAKER IN THE WORLD**

**THE OMNI...  
...BY RECTAVOX**

**THE RECTAVOX COMPANY  
CENTRAL BUILDINGS, WALLSEND  
NORTHUMBERLAND. Tel: 624845**

# Imhof Speakers



It's a number of years since Imhofs produced their own hi-fi loudspeakers (remember the famous Reflexion models?) and it has taken a long time to find a successor worthy of carrying our name. With so many different speakers on the market, our designers and engineers were set the task of producing models that offered better than average quality

at lower than average prices and yet still had that extra something you would expect from Imhofs. The result is the IM range of speakers which are available in a variety of finishes and have interchangeable 'decor' front grilles so you can have a model to harmonise with your home.

We have also introduced the improved Imhof Junior Mk. II

speaker which we think is fantastic value and is sold complete with DIN two-pin connector and a 36-ft extension lead.

While technical specifications are given below, we would really like you to call in and see them and judge for yourself just how good they are and then we feel sure you will agree that they really are value for money.

model	IM.100	IM.200	JUNIOR MK. 11
	<i>above top</i>	<i>above right</i>	<i>above left</i>
type	Infinite baffle	Infinite baffle	Infinite baffle
units	13" x 8" bass, 1½" treble	13" x 9" bass, 1½" treble	13" x 8" bass, 3" treble
crossover	1 kHz	1 kHz	5 kHz
frequency range	50 Hz-20 kHz	40 Hz-20 kHz	50 Hz-20 kHz
impedance	8 ohms	8 ohms	8 ohms
power handling	15 watts RMS	25 watts RMS	10 watts RMS
size	11½" w x 19" h x 7½" d	15½" w x 24½" h x 10½" d	12½" w x 24" h x 9½" d
grille	Charcoal, Silver Sand or Pearl Grey	Charcoal, Silver Sand or Pearl Grey	Black
finish	Teak or Walnut	Teak or Walnut	Teak
and price	£25.90 Slatted front (teak only) £28.40	£38.85	£16.80

## This year of Hi-Fi

The new edition of This Year of Hi-Fi is a 'must' for both beginner and expert. Contains details of all the worthwhile equipment that is currently available in this country together with helpful notes on choosing hi-fi and full information on the services offered by Imhofs.

This Year of Hi-Fi costs 15p post free but each copy contains a voucher worth £1.00 when you spend over £20.00 on equipment (sorry - not on records). To readers living overseas it is sent free and post free but the voucher is not included. Send for your copy today.



## IMHOFS

Dept. HF/72, 112-116 New Oxford Street, London WC1A 1HJ telephone 01-636 7878

Please tick appropriate squares

I enclose cheque/postal order/stamps for 15p. — please send me a copy of THIS YEAR OF HI-FI

Living overseas I would like a free copy of THIS YEAR OF HI-FI

Please send me, free of charge, details of:  
 monthly record accounts   
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 Eddystone communication receivers

NAME.....

ADDRESS.....



Recommended retail prices: R50 Loudspeaker £98, R40 Loudspeaker £65; P100 Amplifier £145, P50 Amplifier £88

# Cambridge Audio

Cambridge Audio Laboratories Limited, The River Mill, St Ives, Huntingdon PE17 4EP

telephone St Ives (04806) 2901

# Directory of Speaker Enclosures

**IMPORTANT** See Introduction for note about PT changes affecting speaker systems

Abbreviations used in this section are given on page 46.

## ■ ACOUSTIC RESEARCH

Distributors: Bell & Howell Ltd,  
Audio Products Division, Alperton House,  
Bridgewater Road, Alperton, Middlesex,  
HA01EG. Tel: 01-902 8812. Telex: 261378.

### AR-2ax

Infinite baffle enclosure with units and crossover. One 10in bass driver, one 3½in mid-range unit, one ¾in tweeter. Crossovers: 1.5kHz, 5kHz. FR: 30Hz-20kHz (45Hz-20kHz ±3dB). HC: 20W minimum power, 50W music power. Impedance: 8 ohms. Mid-range and treble attenuators on rear of unit. Size: 13½ × 24 × 11½in. Weight: 36½lb. Finish: (standard) teak, rosewood, pine (other finishes to order). Five-year guarantee. Price: (teak and rosewood) £94; (pine) £74.

### AR-3a ★

Infinite baffle enclosure with units and crossover. One 12in bass driver, one 1½in mid-range unit, one ¾in tweeter. Crossovers: 600Hz, 5kHz. FR: 20Hz-20kHz. HC: 25W RMS. Impedance: 4 ohms. Size: 14 × 25 × 11¾in. Weight: 53lb. Treble/mid-range adjustment on rear of unit. Finish: (standard) teak, rosewood, pine (other finishes to order). Five year guarantee. Price: (teak and rosewood) £178; (pine) £153.

### AR-4x

Infinite baffle enclosure with units and crossover. One 8in bass driver, two 2½in cone tweeters. Crossover: 950Hz. FR: 30Hz-20kHz (45Hz-20kHz ±5dB). HC: 15W minimum, 60W music power. Impedance: 8 ohms. Adjustment provided for treble. Size: 10 × 19 × 9in. Weight: 18½lb. Finish: teak or pine. Price: (teak) £39.95; (pine) £35.50.

### AR-5

Infinite baffle enclosure with units and crossovers. One 10in bass driver, one 1½in mid-range unit, one ¾in dome tweeter. Crossovers: 600Hz, 5kHz. FR: 30Hz-20kHz (45Hz-20kHz -3dB). HC: 20W minimum, 60W music power. Impedance: 8 ohms. Separate adjustments on rear

of cabinet for treble/mid-range. Size: 13½ × 24 × 11½in. Weight: 39lb. Finish: teak, rosewood, pine (other finishes to order). Five years guarantee. Price: (teak and rosewood) £127; (pine) £106.

### AR-6 ★

Infinite baffle enclosure with units and crossover. One 8in bass driver with acoustic suspension and silicone damped coil, one 2½in mid-range unit, one 1½in dome tweeter. Crossover: 1.5kHz. FR: 25Hz-25kHz (35Hz-20kHz ±5dB). HC: 20W minimum, 100W music power. Impedance: 8 ohms. Treble adjustment on rear of cabinet. Size: 19½ × 12 × 7in. Finish: teak, pine. Weight: 20lb. Five year guarantee. Price: (teak) £63; (pine) £55.

■ ACOUSTICAL See Quad.

## ■ ADASTRA ELECTRONICS LTD

Unit 22, Cricklewood Trading Estate, Clarendon Road, London, NW21TU.  
Tel: 01-452 6288 (answering service 01-452 6289).

### Sonata ★

Speaker enclosure without units. Removable sub-baffle suitable for all speakers up to 10 × 6in, plus tweeter. Finish: straight grained teak with contrasting front edges and matching grille material. Size: 16 × 8 × 6in. Price: (per pair) approximately £7.90 (including PT).

### La Scala

Speaker enclosure without units. Removable sub-baffle suitable for all speakers up to 13 × 8in, plus tweeter. Finish: polished grained teak with satinwood surround, black/grey flecked Vynair grille. Size: 14 × 21 × 8¼in. Price: (each) approximately £7.90 (including PT).

## ■ AKAI

Rank Audio Products, PO Box 70, Great West Road, Brentford, Middlesex.  
Tel: 01-568 9222. Telex: 24408.

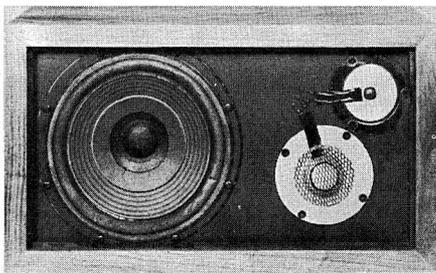
### SW130 ★

Infinite baffle enclosure with units. One 12in bass driver, one 3½in tweeter. FR: 50Hz-17kHz. HC: 18W RMS. Impedance: 8 ohms. Size: 20½ × 12½ × 10½in. Weight: 17½lb. Finish: walnut, Price: £36 (no PT).

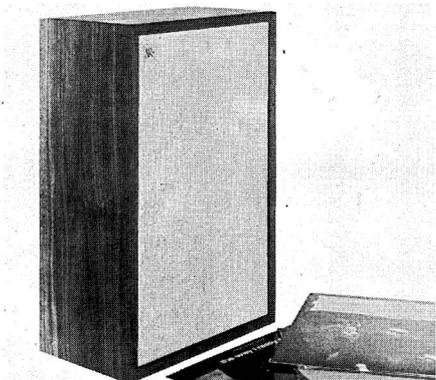
### SW155

Reflex enclosure with units and crossover. One 12in roll-edge bass driver, one 5in cone mid-range unit, one 2in horn tweeter, one 2½in horn super tweeter. Crossover: (6dB/octave and 12dB/octave) 1.2kHz, 5kHz, 15kHz. FR: 25Hz-21kHz. HC: 35W RMS. Impedance: 8 ohms. Size: 25 × 16 × 13¾in. Weight: 40lb. Finish:

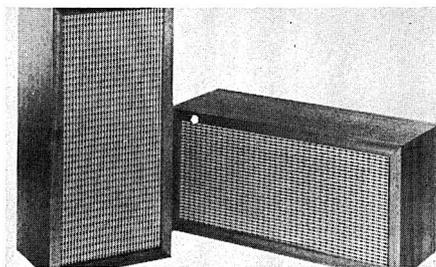
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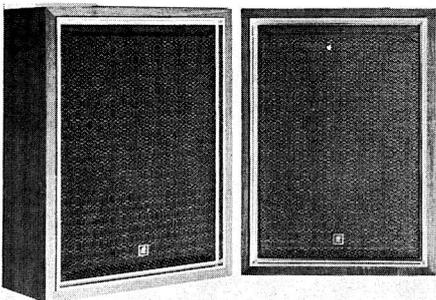
Acoustic Research AR-3a



Acoustic Research AR-6



Adastra Sonata



Akai SW130

walnut. Pipe ducted reflex cabinet. Price: £55 (no PT).

#### SW180

Special speaker enclosure with units and crossover. Full details of specification available on request. Price: £125 (no PT).

#### ■ RICHARD ALLAN RADIO LTD

Bradford Road, Gomersal, Cleckheaton, Yorkshire. Tel: Cleckheaton 2442/3.

Cables: Acoustics, Bradford.

#### Minette

Infinite baffle bookshelf enclosure. 5in bass unit, 4in tweeter. FR: 50Hz-17kHz. HC 10W. Size:  $11\frac{1}{2} \times 7 \times 6\frac{1}{2}$ in. Weight: 11lb. Price: £14.25 (plus £3.22 PT).

#### Chaconne

Full range two-way system comprising 8in bass unit and 4in tweeter. FR: 40Hz-17kHz. HC: 10W. Size:  $20 \times 12 \times 9$ in. Weight: 21lb. Price: £17.25 (plus £3.90 PT).

#### Flamenco

Full-range three-way system. One 8in bass driver, one 5in mid-range unit, one 4in tweeter. FR: 40Hz-17kHz. HC: 15W. Size:  $20 \times 12 \times 8\frac{1}{2}$ in. Weight: 21lb. Finish: teak or walnut. Price: £25 (no PT).

#### Pavane

Full-range three-way system comprising 12in bass unit, 8in mid-range speaker and 4in tweeter. FR: 30Hz-17kHz. HC: 15W. Size:  $25\frac{1}{2} \times 15\frac{1}{2} \times 12$ in. Weight: 38lb. Price: £35.25.

#### Super Sarabande

Full-range three-way system. One 15in bass driver, one 8in mid-range unit, one 4in tweeter. FR: 25Hz-17kHz. HC: 20W. Size:  $32 \times 18 \times 17$ in. 75lb. Price: £61 (no PT).

#### High Fidelity Module

Integrated speaker assembly comprising 5in bass unit, 4in tweeter and crossover network mounted on aluminium alloy baffle for direct mounting into small bookshelf enclosure. Size:  $11 \times 6\frac{1}{2}$ in. Weight: 5lb. Price: £9.35 (plus £2.12 PT).

#### Richard Allan Kits

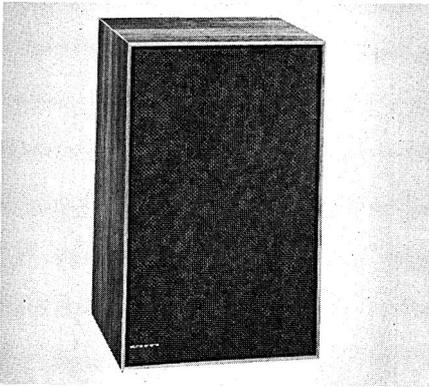
See Constructional Kits section for details of Twin Assembly, Triple Assembly and Super Assembly speaker kits.

#### ■ ALPHA

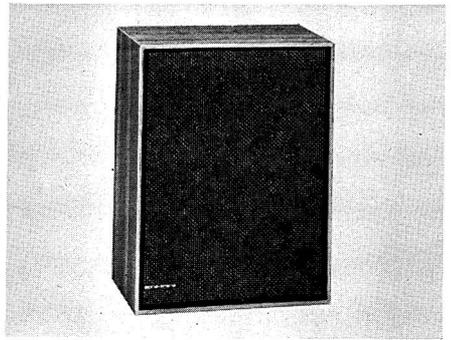
Highgate Acoustics Ltd,  
184-188 Great Portland Street, London, W1.  
Tel: 01-636 2901.

#### HT7 Mk II ★

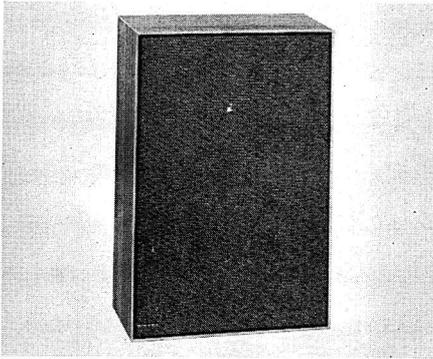
Infinite baffle enclosure with units and crossover.  $8\frac{1}{4}$ in bass driver, two  $2\frac{1}{4}$ in tweeters. Crossover: 3.5kHz. FR: 50Hz-18kHz. HC: 10W RMS.



Alpha HT7 Mk II



Alpha HT17 Mk II



Alpha HT10 Mk II



Altec-Lansing I 205

Impedance: 8 ohms. Finish: teak or walnut. Size:  $17\frac{7}{8} \times 11\frac{1}{4} \times 6\frac{7}{8}$  in. Weight: 15lb. Price: £18-50 (no PT).

**HT10 Mk II ★**

Infinite baffle enclosure with units and crossover. 7in bass driver, 4½in dual cone mid-range unit, 4½in tweeter. Crossover: 3-5kHz. FR: 40Hz-20kHz. HC: 20W RMS. Impedance: 8 ohms. Finish teak or rosewood. Size:  $22\frac{7}{8} \times 15 \times 5\frac{1}{2}$  in. Weight: 22½lb. Price: £21 (no PT).

**HT16**

Infinite baffle enclosure with unit. 8½in full-range dual-cone driver. FR: 50Hz-18kHz. HC: 10W RMS. Impedance: 4 or 8 ohms. Finish: teak. Size:  $15\frac{1}{2} \times 11 \times 7$  in. Price: £10-67½ (plus £2-32½ PT).

**HT17 Mk II ★**

Infinite baffle enclosure with units and crossover. 7 × 5in bass driver, two 2½in tweeters. Crossover: 3-5kHz. FR: 60Hz-18kHz. HC: 10W RMS. Impedance: 8 ohms. Finish: teak or walnut. Size:  $13 \times 10 \times 4\frac{7}{8}$  in. Weight: 7 lb. Price: £13 (no PT).

**HT20 Mk II**

Infinite baffle enclosure with units. 8½in bass driver, 5in mid-range unit, 2½in tweeter. Cross-overs: 750Hz, 4kHz. FR: 40Hz-20kHz. HC: 20W. Impedance: 8 ohms. Finish: teak or walnut. Size:  $17\frac{7}{8}$  in ×  $11\frac{1}{8} \times 9\frac{7}{8}$  in. Weight: 18lb. Price: £27 (no PT).

■ **ALTEC LANSING**

Ling Dynamic Systems Ltd,  
Baldock Road, Royston, Herts, SG8 5BQ.  
Tel: Royston 42424. Telex: 81174.

**1205AX ★**

Reflex enclosure with units and built-in amplifier. 15in bass driver, 808-4Z HF driver, 25in sectoral horn. Crossover: 500Hz. HC: 85W. Input impedance to amplifier: 18K. Speaker system 4 ohms. FR: 35Hz-20kHz. Size:  $45 \times 28 \times 25$  in. Weight: 137lb. Finish: black vinyl. Price: £295.

**1203**

Reflex enclosure with units and built-in ampli-

★ Indicates entry is illustrated

fier. 15in bass driver, HF horn unit, 807-4C driver. Crossover 800Hz. HC: 85W. Input impedance to amplifier: 18K. Speaker system 4 ohms. FR: 40Hz-15kHz. Size: 42 × 24 × 20in. Weight: 112lb. Finish: black vinyl. Price: £250.

### ■ AMSTRAD

Amstrad Electronics Ltd, 34-35 Great Sutton Street, London, EC1. Tel: 01-251 0241.

#### Apollo 8

Infinite baffle enclosure with units and crossover. One 8in bass driver, one 3½in tweeter. Capacitor crossover. FR: 45Hz-18.5kHz. HC: 7W RMS. Impedance: 8 or 15 ohms. Finish: teak with padded front and silver trim surround. Size: 17½ × 10½ × 8in. Weight: 7lb. Price: £13.50 (no PT).

### ■ ASTEC

A. S. Techniques, 35 Waterloo Street, Leicester. Tel: Leicester 26319

#### System 10

Hybrid reflex cabinet with unit. Tapered pipe inverter enclosure. One 7½in Astec full-range unit. FR: 45Hz-20kHz ± 4dB. HC: 15W RMS. Impedance: 8 ohms. Size: 17½in high, 11in wide, 9in deep. Finish: teak and white (walnut to order). High power bandwidth at low frequencies. Price: £29.50 (no PT).

#### System 15

Hybrid reflex cabinet with unit. Tapered pipe inverter enclosure. One 7½in Astec full-range unit. FR: 30Hz-20kHz ± 4dB. HC: 15W RMS. Impedance: 8 ohms. Size: 17½in high, 11in wide, 9in deep. Finish: teak and white (walnut to order). High power bandwidth at low frequencies. Price: £38.75 (no PT).

### ■ AUDIO SERVICES LTD

82 East Barnet Road, New Barnet, Herts. Tel: 01-449 6605.

#### Dynasonic 2TIB

Infinite baffle enclosure with units and crossover. One 13 × 8in bass driver, two 2in tweeters. Crossover: 2kHz. FR: 50Hz-20kHz. HC: 15W RMS. Impedance: 8 ohms. Finish: teak. Price: £32.

#### Shackman Dynasonic Monitor

Reflex enclosure with units and crossover. Three bass drivers, two tweeters. Crossover: 2.5kHz. FR: 35Hz-20kHz. HC: 30W RMS. Impedance: 8 ohms. Finish: teak. Price: £62; (with decorative gold coloured metal grille) £65.

#### Shackman Dynastatic AS3

Bass reflex enclosure with units and crossover. Three bass units plus Shackman push-pull constant charge electrostatic mid-range and tweeter.

Crossover: 800Hz. FR: 30Hz-20kHz. HC: 30W. Impedance: 8 ohms. Finish: teak. Price: £79.50.

### Shackman Dynastatic AS100

Bass reflex enclosure with units and crossover. Three bass drivers plus Shackman push-pull constant-charge electrostatic unit operating as doublet. Crossover: 500Hz. FR: 30Hz-20kHz. HC: 30W RMS. Impedance: 8 ohms. Finish: teak. Price: £140.

### ■ AVERINE ELECTRONICS

PO Box No. 6, Ruislip, Middlesex, HA4 8AT.

#### L60

Enclosure with three units and crossovers. One bass driver, one mid-range unit, one tweeter. FR: 30Hz-30kHz. HC: 30W RMS. Crossover: 350Hz, 3.5kHz. Impedance: 8 ohms. Weight: 50lb. Finish: teak, mahogany or white. Grille material: brown, grey, black or fawn. Price: to be announced.

### ■ BANG & OLUFSEN UK LTD

Eastbrook Road, Gloucester, GL4 7DE. Tel: Gloucester 21591.

#### Beovox 1700

Pressure chamber enclosure with units and crossover. One 6in bass driver, one 1in dome tweeter. Crossover: 5kHz. FR: 50Hz-20kHz. HC: 15W RMS. Impedance: 4 ohms. Spec exceeds DIN 45-500. Size: 13½ × 7½ × 7½in. Weight: 8½lb. Finish: teak or rosewood. Sold in matched pairs. Price: (teak) £38.31 (plus £9.59 PT) per pair; (rosewood) £39.91 (plus £9.99 PT) per pair.

#### Beovox 1800

Pressure chamber enclosure with units and crossover. One 6in bass driver, one 1in dome tweeter. Crossover: 5kHz. FR: 50Hz-20kHz. HC: 15W RMS. Impedance: 4 ohms. Spec exceeds DIN 45-500. Size: 13 × 7½ × 4in. Weight: 13½lb. Finish: teak or rosewood. Sold in matched pairs. Price: (teak) £43.91 (plus £10.99 PT) per pair; (rosewood) £45.51 (plus £11.39 PT) per pair.

#### Beovox 2700

Pressure chamber enclosure with units and crossover. One 7in bass driver, one 1½in mid-range unit, one 1in tweeter. Crossover: 3.5kHz and 10kHz. FR: 45Hz-20kHz. HC: 20W RMS. Impedance: 4 ohms. Spec exceeds DIN 45-500. Size: 16½ × 8½ × 8½in. Weight: 12lb 2oz. Finish: teak or rosewood. Sold in matched pairs. Price: (teak) £57.90 (no PT) per pair; (rosewood) £59.90 (no PT) per pair.

#### Beovox 3700

Pressure chamber enclosure with units and crossover. One 8in bass driver, one 1½in mid-range unit, one 2in tweeter. Crossover: 3.5kHz

# Thank you fans, thank you.

The first Sonab speaker was sold back in June 1966.

The first practical, functioning omnidirectional speaker ever marketed, it was the product of twelve years work by Stig Carlsson at the University of Stockholm.

It was covered by world patents.

There was nothing else like it anywhere.

How things have changed.

In the last five years at least six major audio manufacturers have started producing speakers that look uncommonly like ours.

Sadly it's with looks that the resemblance ends.

They sound very different.

Those Carlsson patents keep getting in the way.

Imitation, we're told is the sincerest form of appreciation.

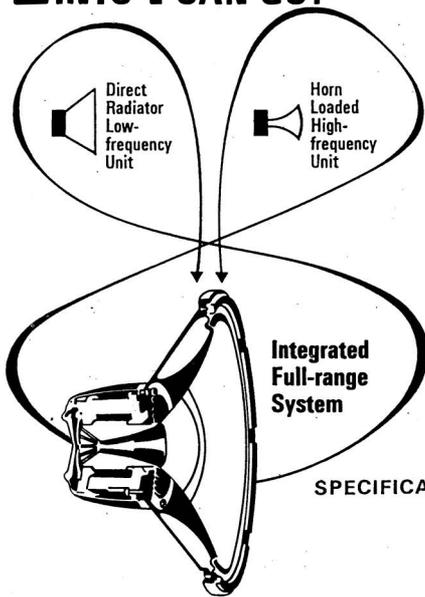
And for that appreciation we would like to say – thank you, fans, thank you.

And a word of encouragement.

Be patient, those patents have only ten years to go.

**Sonab**  
of Sweden,  
136 Mansfield Road,  
Acton, London W.3.  
01-993 0849

**2 INTO 1 CAN GO!**



THE *Monitor*

**GOLD** \*

**DUAL CONCENTRIC**

... provides the perfect integrated source needed for stereo. The Monitor Gold is two separate transducers in a single assembly fed by a sophisticated cross-over and treble control network.

**SPECIFICATION** Frequency Response: 30-20,000 Hz.

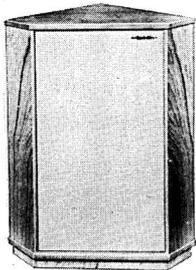
**Power Handling Capacity:**

15" 50 Watts, 12" 30 Watts, III LZ 15 Watts.

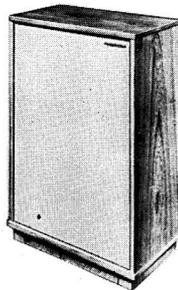
**Impedance:** 8Ω nominal, 5Ω minimum.

**AND IT SOUNDS BEST IN A**

**TANNOY ENCLOSURE**



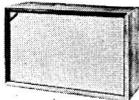
"Lancaster" free-standing fitted with 12" or 15" Dual Concentric. Height 2'9½", width 1'9½", depth 1'0½".



"Lancaster" corner mounting fitted with 12" Dual Concentric. Height 2'9", width 2'1". Front to rear corner 1'4½"

70% OF THE MONITOR GOLDS PRODUCED ARE EXPORTED TO:

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"III LZ Mk. II"

Aperiodic enclosure with III LZ unit.

Height 1'3", width 1'11", depth 9½".

**TANNOY**  
 NORWOOD ROAD • WEST NORWOOD  
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 TELEPHONE 01-670 1131

*The Majority of Recording and TV Studios use TANNOY Monitors*



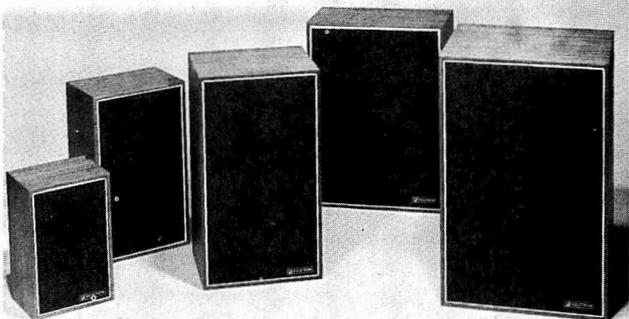
# Names to look for

If you're in the market for speakers, or a cartridge, or an amplifier, be sure that your Hi-Fi dealer demonstrates the equipment on this page. It represents the finest value for money obtainable today.

## A Hi-Fi Shopper's Guide by Kelgrov Sales



Sole U.K. Distributors for Keletron, Rota and Grosvenor Hi-Fi equipment: Kelgrov (Sales) Ltd., 107/113 London Road, London E.13.



## Keletron

Loudspeakers ranging from bookshelf to floor standing. All Keletron models are 4-way speaker systems of 8-16 ohms impedance, fully padded to damp out any panel resonances and completely airtight.

LEFT TO RIGHT.

### Model KN500:

Power handling: 5 watts R.M.S. Frequency range: 65 Hz to 18,500 Hz.

### Model KN 700:

Power handling: 7 watts R.M.S. Frequency range: 45 Hz to 18,500 Hz.

### Model KN1000:

Power handling: 10 watts R.M.S. Frequency range: 40 Hz to 19,000 Hz.

### Model KN1500:

Power handling: 15 watts R.M.S. Frequency range: 30 Hz to 19,000 Hz.

### Model KN2000:

Power handling: 20 watts R.M.S. Frequency range: 30 Hz to 19,000 Hz.



## Rota

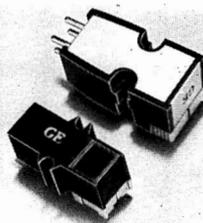
ABOVE: Rota OTL-1500: A fully integrated all-transistor Stereo Amplifier with power output 5 watts R.M.S. per channel. Frequency response 20-20,000 Hz  $\pm 1$  dB. Inputs for Crystal, Ceramic and Magnetic Cartridges and Aux. for Tape and Tuner. Also headphone socket.

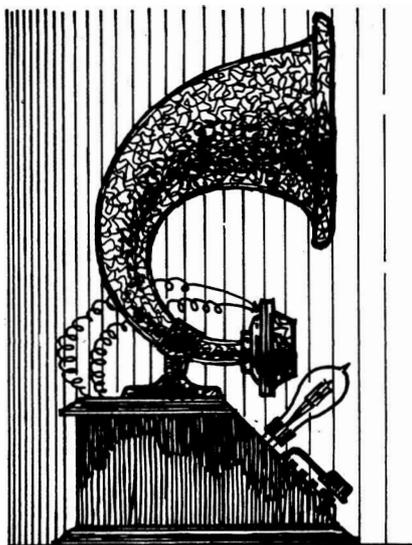
BELOW: Rota OTL-2200: A fully integrated all-transistor Stereo Amplifier with power output 10 watts R.M.S. per channel. Frequency response 20-20,000 Hz  $\pm 1$  dB. Inputs for Crystal, Ceramic and Magnetic Cartridges, Tuner, Tape in Tape out and Mic. Also headphone socket.

## Grosvenor

ABOVE: MCI-5 Stereo Cartridge. Frequency response 15-20,000 Hz. Output voltage 5 mV at 1,000 Hz 5 cms. Channel balance 1 dB at 1,000 Hz. Channel separation better than 25 dB at 1,000 Hz. Impedance 2,200 ohms at 1,000 Hz. Compliance 8x10-6 cm/dyne. Tracking pressure 3-5 grams. Tracking angle 15°. Stylus 0.7 mil diamond. Cartridge weight 6.5 grams. Mounting  $\frac{1}{2}$ " or 12.7 mm.

BELOW: SMC-101 Stereo Cartridge. Frequency response 20-20,000 Hz. Output voltage 5 mV at 1,000 Hz 5 cms. Channel balance 1 dB at 1,000 Hz. Channel separation better than 25 dB at 1,000 Hz. Impedance 2,500 ohms at 1,000 Hz. Compliance 8 x 10-6 cm/dyne. Tracking pressure 3-5 grams. Stylus 0.7 mil diamond. Cartridge weight 9 grams. Mounting  $\frac{1}{2}$ " or 12.7 mm.



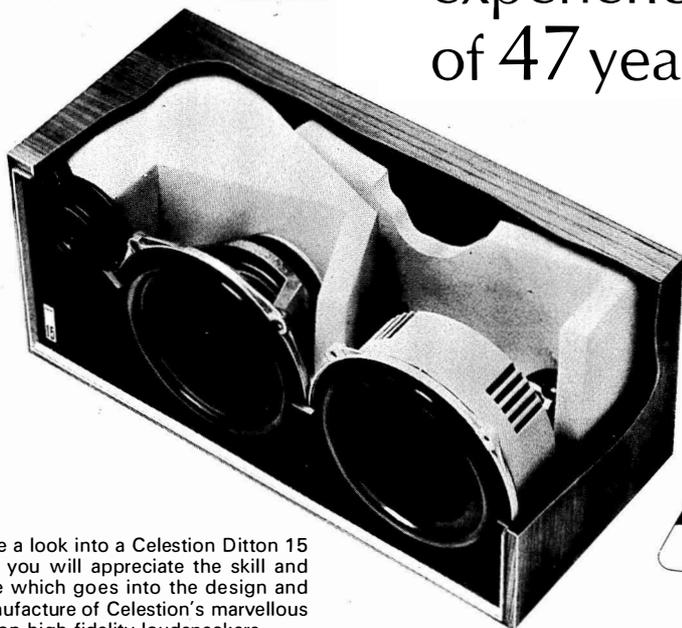


when you buy

**Celestion** Studio Series

Loudspeakers for the Perfectionist

you enjoy  
the sound  
experience  
of 47 years



Take a look into a Celestion Ditton 15 and you will appreciate the skill and care which goes into the design and manufacture of Celestion's marvellous Ditton high fidelity loudspeakers.

Meticulous attention to detail, from the superb furniture finish right through to the precision engineering at the heart, ensure the quality for which Celestion are world renowned.

For the sheer enjoyment of your favourite music the Celestion Sound Experience has no equal. Just send your name and address and full details will be mailed at once.

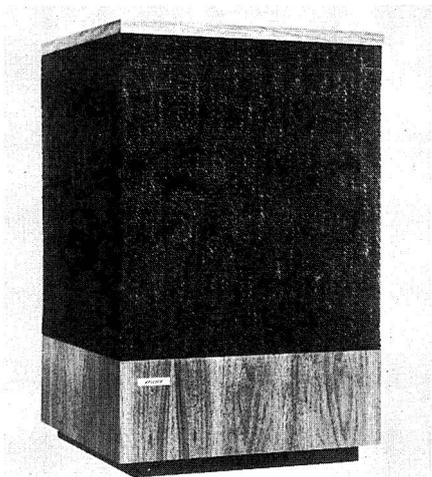


**Celestion**

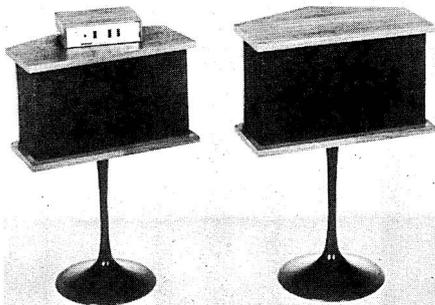


**ROLA CELESTION LIMITED**

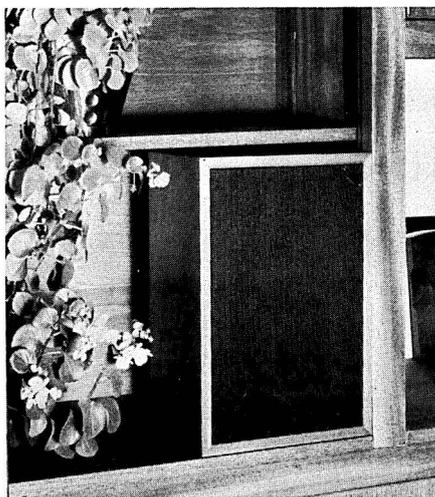
DITTON WORKS, FOXHALL ROAD, IPSWICH, SUFFOLK IP3 8JP



Bose 501



Bose 901



Brimham Firecrest 71

and 10kHz. FR: 40Hz-20kHz. HC: 40W RMS. Impedance: 4 ohms. Spec exceeds DIN 45-500. Size:  $19\frac{3}{4} \times 9\frac{3}{8} \times 9\frac{7}{8}$ in. Weight: 18 $\frac{3}{4}$ lb. Finish: teak or rosewood. Sold in matched pairs. Price: (teak) £74-90 (no PT) per pair; (rosewood) £76-90 (no PT) per pair.

**Beovox 4700**

Pressure chamber enclosure with units and crossover. Two 7 $\frac{1}{2}$ in bass drivers, one 5in mid-range unit, one 1 $\frac{1}{2}$ in dome tweeter. Crossover: 500Hz and 4kHz. FR: 35Hz-20kHz. HC: 50W RMS. Impedance: 4 ohms. Spec exceeds DIN 45-500. Size:  $30 \times 11\frac{3}{8} \times 11\frac{3}{8}$ in. Weight: 28 $\frac{1}{2}$ lb. Sold in matched pairs. Finish: teak or rosewood. Price: (teak) £95-50 (no PT) per pair; (rosewood) £98-50 (no PT) per pair.

**Beovox 5700**

Enclosure incorporating passive radiator, three driver units and crossover. One 10in bass driver, one 2 $\frac{1}{4}$ in mid-range unit, one  $\frac{3}{4}$ in tweeter, one 10in passive radiator. Crossover: 25Hz and 6kHz. FR: 25Hz-20kHz. HC: 60W RMS. Impedance: 4-8 ohms. Spec exceeds DIN 45-500. Size:  $26 \times 14\frac{1}{4} \times 11\frac{3}{4}$ in. Weight: 49 $\frac{1}{2}$ lb. Sold in matched pairs. Finish: teak or rosewood. Price: (teak) £149-50 (no PT) per pair; (rosewood) £155-50 (no PT) per pair.

**BOSE CORPORATION**

Distributors: Expotus Ltd, 10 Museum Street, London, WC1. Tel: 01-836 3747.

**501 ★**

Infinite baffle enclosure with units and crossover. One forward-facing 10in bass driver, two rear-angled 3 $\frac{1}{2}$ in mid-range and HF units. FR: 40Hz-20kHz. HC: 100W RMS. Impedance: 4 ohms. Size:  $14\frac{1}{2} \times 14\frac{1}{2} \times 24$ in. Weight: 38lb. Finish: walnut. Sold in matched pairs. Price: (per pair) £150 (no PT).

**901 ★**

Infinite baffle enclosure with units. Nine 4in high-compliance paper cone speakers (one forward-facing, eight on rear baffles). No crossover network. FR: 25Hz-20kHz. HC: > 100W RMS. Impedance: 8 ohms. Active equaliser corrects response shape and adjusts for room acoustics. Size:  $20\frac{5}{8} \times 12\frac{3}{4} \times 12\frac{3}{4}$ in. Weight: 33lb. Finish: walnut. Sold in matched pairs with equaliser. Price: (per pair including equaliser) £250.

**BRIMHAM**

P. F. and A. R. Helme Ltd, Summerbridge, Harrogate, HG34DR, Yorks. Tel: Darley 279.

New 71 Series loudspeaker systems finished in natural oiled teak with matching speaker grille in black Vynair. Various combinations of drive units by Peerless of Denmark incorporated.

★ Indicates entry is illustrated

All units are infinite baffle and have 4 ohms or 8 ohms impedance.

**Linnet 71**

Houses one full-range special 6 × 4in unit. HC: 15W. FR: 60Hz-20kHz. Dimensions: 12 × 8 × 7in. Price: £14-30.

**Firecrest 71 ★**

Houses 6½in bass driver with two 2in tweeters. Crossover: 2-4kHz. FR: 45Hz-22kHz. HC: 12W RMS. Dimensions: 14 × 9 × 7½in. Price: £22-50.

**Swift 71 ★**

Houses a 6½in bass unit and two 2in tweeters. Crossover frequency: 2-5kHz. HC 15W. FR: 40Hz-22kHz. Dimensions: 18 × 10 × 9in. Price: £24-85.

**Swallow 71**

Houses an 8in bass unit and two 2½in tweeters. Crossover frequency: 2-5kHz. HC 35W. FR: 35Hz-22kHz. Dimensions: 20 × 11 × 9in. Price: £32.

**Kestrel (kit form)**

Houses a 10 × 6in bass driver and a 2½in tweeter. Crossover frequency: 3-5kHz. HC 10W. FR: 40Hz-18kHz. Dimensions: 21 × 11 × 10in. Price: (kit) £24-88.

**Oriole 71 ★**

Houses a 12in bass unit, 5 × 7in mid-range and two 2½in tweeters. Crossover frequencies: 500 Hz and 3-5kHz. HC 40W. FR: 25Hz-18kHz. Dimensions: 29 × 21 × 9in. Price: £59-50.

**Heron 71**

Houses special 8in bass driver, 5in sealed-back mid-range unit and 2in tweeter. Three-way crossover at 750Hz and 4kHz. HC: 17W RMS. FR: 40Hz-18kHz. Dimensions: 22½ × 12½ × 10in. Price: £29-50.

Prices quoted for Brimham speakers include PT where applicable.

■ **BURNE-JONES & CO LTD**  
18 Brunswick Road, Sutton, Surrey.

**B.J. Treble 20**

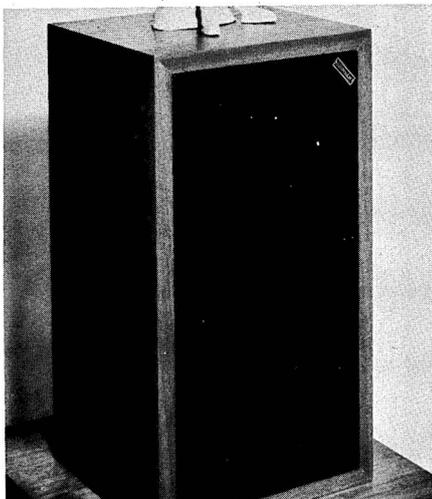
Omni-directional multi-horn. One 4in unit. Crossover built-in. FR: 1-18kHz. Size: 6 × 5in. Weight: 1½lb. Price: £3.

**B.J. Treble Twin**

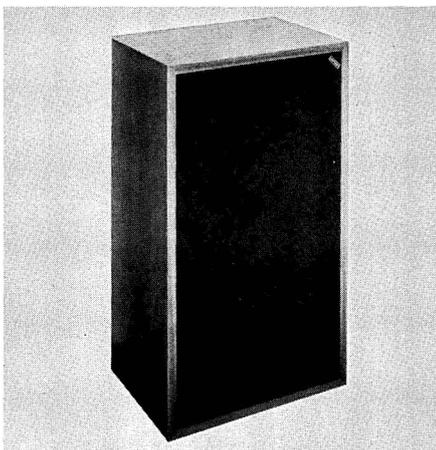
Omni-directional horn. Two 4in drive units. Crossover included. FR: 900Hz-18kHz. Size: 9 × 4½ × 6in. Weight: 2lb. Price: £5-50.

■ **BUSH-ARENA**

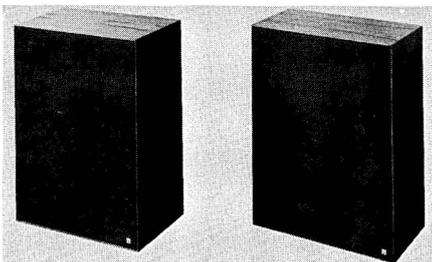
Rank Bush Murphy Ltd,  
Power Road, Chiswick, London, W4.  
Tel: 01-994 6491.



*Brimham Swift 71*



*Brimham Oriole 71*



*Bush-Arena L530*

**L530 ★**

Three-unit enclosure for floor or wall mounting. One 10in bass driver, one 5in mid-range unit, one 1in tweeter. FR: 35Hz-20kHz. Impedance: 4 ohms. HC: 25W RMS. Size:  $22\frac{3}{4} \times 16\frac{1}{8} \times 9\frac{1}{2}$ in. Finish: teak veneer. Supplied with wall mounting brackets and 20ft connecting leads. Sold in matched pairs. Price: (per pair) £78 (no PT).

**■ BUSH NELSON LTD**

Bush House, 6 Yattendon Road, Horley, Surrey. Tel: Horley 5983.

**12/8**

Pressure chamber system. One  $13 \times 8$ in bass unit, one 3in tweeter. Impedance 8 ohms. FR: 20Hz-20kHz. Power capacity 20W. Flux density: bass unit 11,000 gauss, HF unit 10,000 gauss. Bass resonance 20-30Hz. Crossover frequency 5kHz. Teak. Size:  $23 \times 12 \times 11$ in. Price: £65.

**■ B. & W. ELECTRONICS**

Littlehampton Road, Worthing, Sussex. Tel: Worthing 66830.

**DM3 ★**

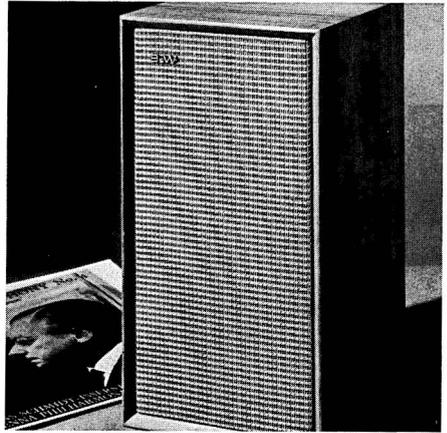
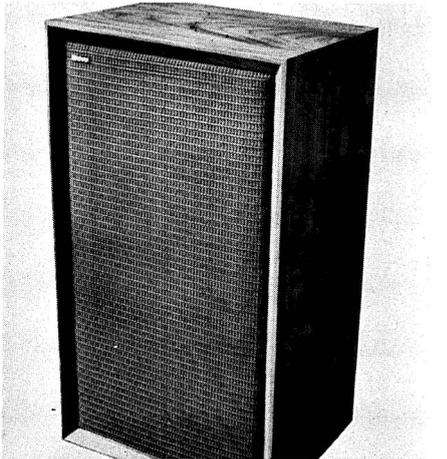
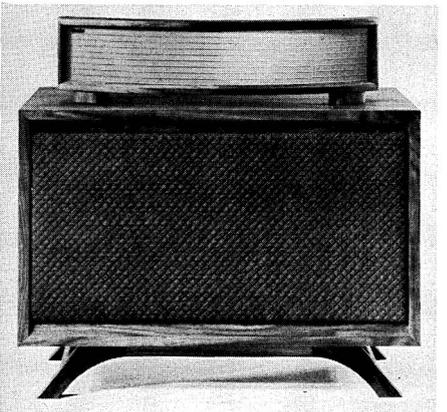
Floor standing enclosure measuring  $15\frac{3}{4} \times 11\frac{1}{2} \times 28\frac{1}{2}$ in with three units. EMI special pen-tested bass radiator. Wide dispersion high frequency transient and wave shaping units. Crossover and filter network individually adjusted for each speaker. Each monitor pen-tested and curve supplied with enclosure. Price: £63 walnut and teak; £69-50 rosewood.

**DMI ★**

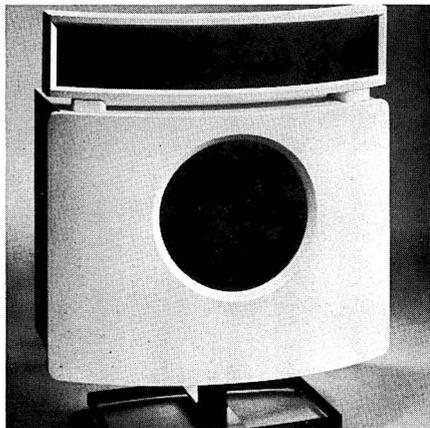
Bookshelf enclosure measuring  $9 \times 8 \times 16\frac{1}{2}$ in, 0.065 cu ft capacity. Units employed:  $10 \times 6$ in laminated glass cone bass/mid-frequency radiator. Pressure mid-frequency/high frequency unit and single tweeter continuing response into supersonic region. Individually pen-tested and supplied with calibration certificate. Finishes: teak, walnut and rosewood. Price: £32.

**DM70 ★**

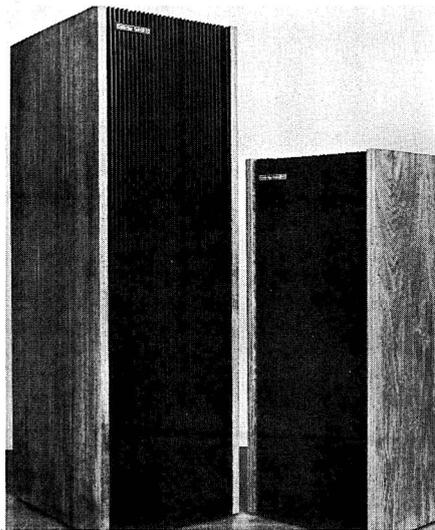
Nominal 13in diameter bass radiator. Laminated and reinforced cone. Eleven-module wide dispersion electrostatic HF unit type 701. Power supply unit, high and low pass filter assembly mounted on separate board. Infinite baffle loading on bass unit with multiple bracing and synthetic fibre absorbents. Electrostatic unit free-standing plug-in assembly with removable rear absorbent pad which allows modification to polar distribution. Impedance: nominal 8 ohms, rising to 25 ohms at 1kHz, but not falling below 4 ohms at 20kHz. HC: 25W RMS throughout entire musical range. FR: 50Hz-15kHz better than  $\pm 4$ dB, 40Hz-20kHz better than  $\pm 5$ dB. System resonance: 40Hz  $\pm 1\%$ . Finish: oiled

*B & W Electronics DMI**B & W Electronics DM3**B & W Electronics Model 70 standard*

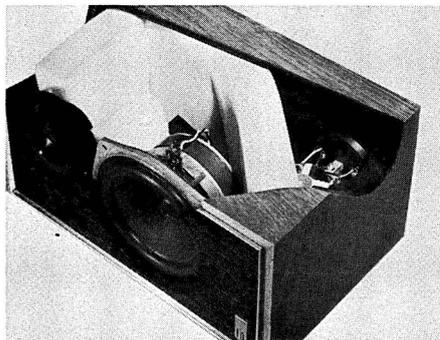
★ Indicates entry is illustrated



*B & W Electronics Continental 70*



*Cambridge Audio R50 (Left) R40 (Right)*



*Celestion Ditton 10 Mk II (interior)*

teak or oiled American walnut. Main cabinet veneered on all surfaces including the back. Size: 31 $\frac{7}{8}$ in high overall, 32in wide, 15in deep. Weight: 107lb. Price: £159.50.

#### **70 Continental ★**

Similar technical specification to the DM70 but in modern styling finished in white. Price: £159.50.

### ■ CAMBRIDGE AUDIO LABORATORIES LTD

The River Mill, St Ives, Huntingdon.  
Tel: St Ives (Hunts) 2901. Telex: 32223.

#### **R50 ★**

High quality transmission line enclosure with units and crossover. Bass driver in damped tapered labyrinth, HF driver in damped tapered pipe. Two HF pressure drivers. FR: 25Hz-25 kHz. Crossover: 400Hz, 3kHz, 10kHz. HC: 25W RMS, 50W music. Impedance: 8 ohms (nominal). Size: 41 $\frac{1}{2}$  × 17 $\frac{3}{8}$  × 13in. Price: £98.

#### **R40 ★**

High quality enclosure incorporating three drive units in a damped tapered labyrinth. HC: 25W RMS, 40W music. Impedance: 8 ohms (nominal). Size: 31 $\frac{1}{4}$  × 13 × 12 $\frac{3}{4}$ in. Price: £65.

### ■ CELESTION

Rola-Celestion Ltd, Ditton Works, Foxhall Road, Ipswich, Suffolk, IP38JP.  
Tel: Ipswich 73131.

#### **Ditton 10 Mk II ★**

Infinite baffle compact system. Long-throw 5in bass unit, HF 1300 Mk 2 HF unit. Built-in half-section crossover 3.5kHz. FR: 35Hz-15 kHz. HC: 10W. Size: 12 $\frac{3}{4}$  × 6 $\frac{3}{4}$  × 8 $\frac{1}{4}$ in. Weight: 13lb. Available in teak and walnut. vci: 4-8 ohms. Price: £25.45 (plus £5.05 PT).

#### **Ditton 15 ★**

Compact infinite baffle enclosure incorporating auxiliary bass radiator. Units: 8in middle/bass speaker. HF 1300 Mk 2 treble radiator. FR: 30Hz-15kHz. HC: 15W RMS. vci: 4-8 ohms. Size: 21 × 9 $\frac{1}{2}$  × 9 $\frac{1}{4}$ in. Weight: 20lb. Finish: walnut or teak. Price: £32 (no PT).

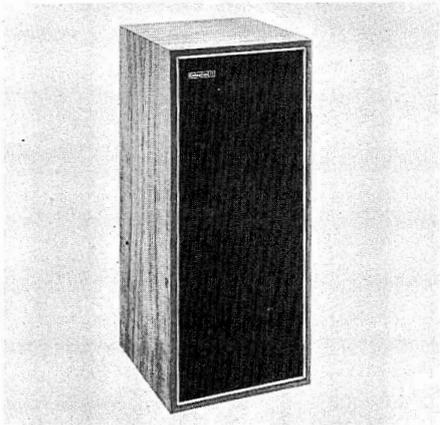
#### **Ditton 25**

Studio monitoring quality speaker enclosure with five drive units. 12in long-throw bass driver, two pressure type mid-range and HF units, pressure type ultra high frequency unit, 12in auxiliary bass radiator. HC: 25W RMS. vci: 4-8 ohms. Size: 32 × 14 × 11in. Weight: 48lb. Finish: teak or walnut. Price: £65 (no PT).

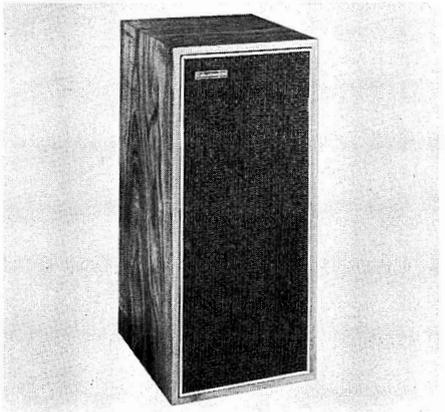
#### **Ditton 120 ★**

Infinite baffle enclosure with two active units and one passive radiator. One 5in long-throw bass driver, one pressure type 1 $\frac{1}{2}$ in tweeter, one 5in

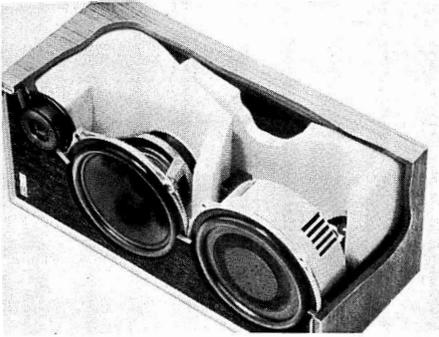
**SPEAKER ENCLOSURES**



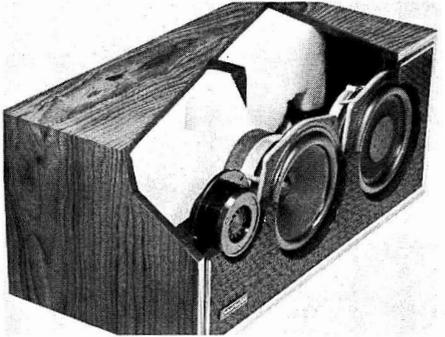
*Celestion Ditton 15*



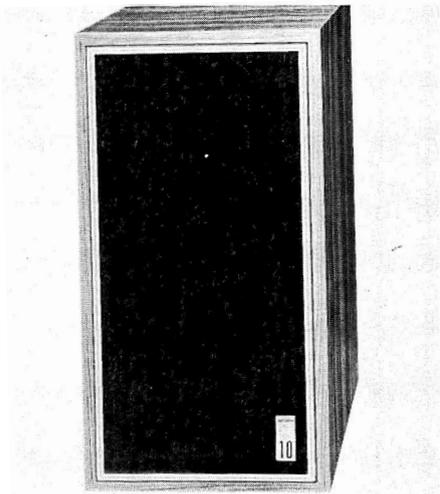
*Celestion Ditton 120*



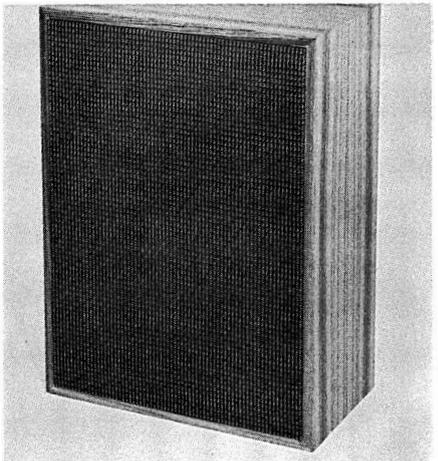
*Celestion Ditton 15*



*Celestion Ditton 120 Cutaway View*



*Celestion Ditton 10*



*City Audio CA/12*

★ Indicates entry is illustrated

auxiliary bass radiator. Crossover: low-loss L/C network. FR: 35Hz-15kHz. HC: 20W (DIN). Impedance: 4-8 ohms. Finish: natural teak or walnut. Size:  $17\frac{1}{4} \times 9 \times 7\frac{3}{4}$ in. Price: £24 (no PT).

### ■ CITY AUDIO SERVICES LTD

7 Chalcot Road, London, NW1.

Tel: 01-586 3211/2.

#### CA/11

Sealed speaker enclosure with three units. One  $13 \times 8$ in bass and mid-range driver, two  $2\frac{1}{2}$ in tweeters. Half-section crossover at 8.5kHz. FR 55Hz-14kHz. HC 10W. Impedance 8 ohms. Size:  $18\frac{1}{2} \times 13 \times 7\frac{1}{4}$ in. Finish: teak. Price: £15-75.

#### CA/12 ★

Sealed speaker enclosure with one 8in and two HF drive units. Quarter-section crossover. FR 55Hz-18kHz. HC 10W. Impedance 15 ohms. Size:  $8\frac{1}{2} \times 13 \times 7\frac{1}{4}$ in. Finish: teak. Price: £18-50.

#### CA/20

Three-speaker enclosure with 8in bass driver and two  $3\frac{1}{2}$ in HF units. FR 40Hz-19kHz. HC: 10W. Impedance 8 ohms. Size:  $18\frac{1}{2} \times 13 \times 7$ in. Finish: teak. Price: £19-50.

### ■ CROWN RADIO CO LTD

128/129 Shoreditch High Street,  
London, E16JE. Tel: 01-739 2382.

#### CSP-7

Infinite baffle enclosure.  $6\frac{1}{2}$ in bass unit,  $2\frac{1}{2}$ in tweeter. FR: 30Hz-20kHz. Impedance: 8 ohms. HC: 20W. Dimensions:  $13\frac{3}{8} \times 9\frac{1}{8} \times 10\frac{1}{2}$ in. Weight: 10lb. Price: £15-44 (plus £3-81 PT).

### ■ A. DAVIES & CO

56 Wellesley Road, London, NW5.

Tel: 01-485 5775.

#### Sherwood type

Based on Goodmans design for Axiom speakers. Approved for Goodmans Axiom 201, Axiom 301 and Goodmans three-way system. Finish: sapele, oak, walnut, teak. Full polish or satin finish. Size:  $23\frac{1}{2} \times 29\frac{1}{2} \times 19\frac{1}{2}$ in. Price: £22 plus the cost of speaker units and crossovers to customer's choice.

#### Bass reflex

Suitable for 12in speakers. Cabinets lined with lin acoustic felt. Finish: sapele, walnut, oak, teak. Full polish or satin finish. Dimensions:  $34 \times 17\frac{1}{2} \times 15\frac{1}{2}$ in. Price: £16-50 plus the cost of speaker unit to customer's choice.

#### A.D. Sealed Folded Horn

Designed to house Goodmans three-speaker system; 12in bass, Midax and Trebax. Alternative speaker arrangements are Kelly ribbon tweeter and Goodmans Audiom 5l or Woollett electrostatic treble and Wharfedale W12/RS/

PST. Suitable full-range single 12in speakers are Goodmans Triaxiom 1220C, 212C, Axiom 301, Axiom 201, Tannoy Monitor. Rear of cabinet ready cut for attenuators. Size:  $31\frac{1}{2}$ in high,  $18 \times 18$ in. Finish: teak or veneer of colour to choice. Front baffle sealed with black Formica (other colours to order) with neutral colour open-weave Tygan speaker grille. Price: (12in speaker version) £27; (15in speaker version) £32. Plus the cost of speaker units and crossovers to customer's choice.

### ■ DECCA

Decca Special Products, Ingate Place,  
Queenstown Road, London, SW8.

Tel: 01-622 6677.

#### Decca Deram Enclosure ★

Two units:  $13 \times 8$ in bass driver, 3in tweeter. HC 8-10W. Size:  $25 \times 13\frac{1}{4} \times 8$ in. Impedance: 15 ohms. Finish: teak or rosewood. Price: (teak) £19; (walnut) £20.

#### Apollo

Enclosure incorporating 12in bass driver and DK30 ribbon tweeter. HC 30W RMS. FR: 30Hz-25kHz. Impedance: 8-15 ohms. Size:  $12 \times 28 \times 17$ in. Weight: 64lb. Finish: teak. Incorporates Kelly Acoustic lens. Response can be tailored to suit room with Room Acoustic Control (RAC). Price: £56.

### ■ DERWENT

Nichols Acoustic Fitments, Church Street,  
Bubwith, near Selby, Yorkshire.

Tel: Bubwith 206.

#### Gem

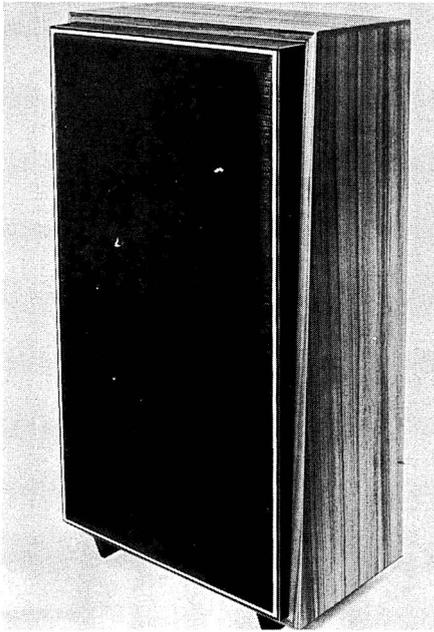
Small bookshelf enclosure only. Designed and approved for use with Richard Allan Hi-Fi module. Size:  $13\frac{1}{2} \times 9 \times 6$ in. Internal volume: 380 cu in. Sealed back panel. Detachable grille fret. Constructed from  $\frac{3}{4}$ in hardwoods. Finish: afrormosia, mahogany or teak. Prices from £7 plus units to choice. Carriage extra.

#### Opal Mk III

Large bookshelf enclosure. Designed for EMI and Fane  $13 \times 8$ in unit or KEF  $13 \times 9$ in and T.15. Size:  $21 \times 14\frac{1}{2} \times 9$ in. Internal volume: 1,850 cu in. Special baffle support and stiffening battens. Sealed, veneered, back panel. Baffle and grille fret secured from front. Constructed from  $\frac{3}{4}$ in solid afrormosia. Prices from £11-50 plus units to choice. Carriage extra.

#### Minor Mk II

Compact enclosure. Designed for 12in bass and treble combination or ellipticals as in Opal Mk III. Size:  $24 \times 15 \times 11\frac{1}{2}$ in. Internal volume: 1-71 cu ft. Construction identical with Opal Mk III. Prices from £14 plus units to choice. Carriage extra.



*Decca Deram*

**Major**

Free-standing enclosure. Designed for Celestion Studio series coaxials, Wharfedale Super 12RS/DD, etc. Suitable for most 12in bass and two/three way systems. Size:  $31\frac{1}{2} \times 18\frac{1}{2} \times 12$ in (including 1in plinth). Internal volume: 2.68 cu ft. Sealed back panel. Finish: selected afrormosia veneers. Prices from £18.50 plus units to choice.

■ **DUAL ELECTRONICS LTD**

St Georgen House, Mill Road, Stokenchurch, High Wycombe, Bucks. Tel: Radnage 3467/8.

**CL170**

Infinite baffle enclosure with units and crossover. One  $7\frac{3}{4}$ in bass driver, one  $4\frac{1}{2} \times 3$ in mid-range unit, one 1in dome tweeter. Crossover: 1.2kHz, 6kHz. Finish: walnut veneer with fine wire-mesh grille. Dual motif on front rotatable so that unit may be used horizontally or vertically. FR: 30Hz-25kHz (DIN 45,500). Bass resonance: 70Hz. Minimum power requirements: 3W. Size:  $19 \times 9\frac{7}{8} \times 8$ in. Volume: 24 litres. Weight: 18½lb. Price: to be announced.

■ **DUETTE**

Distributors: J. J. Silber Ltd, 11 Northburgh Street, London, EC1. Tel: 01-253 8031.

**ARS710 ★**

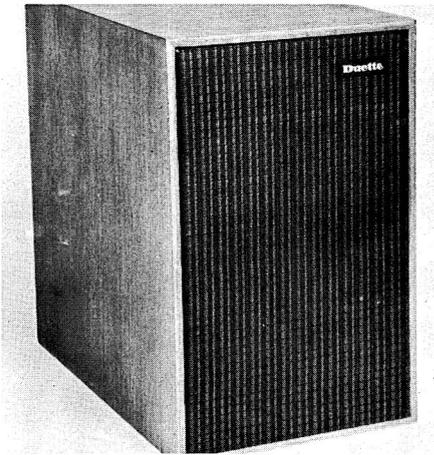
Infinite baffle enclosure with units.  $3\frac{1}{2}$ in long-throw bass driver,  $2\frac{3}{4}$ in tweeter. FR: 50Hz-18kHz. HC: 5W RMS. Impedance: 4 ohms. Finish: Canadian nut. Size:  $9\frac{1}{2} \times 9\frac{3}{4} \times 6$ in. Weight: 6½lb. Price: £8.77 (plus £2.21 PT).

**ARS815**

Infinite baffle enclosure with units. Two  $3\frac{1}{2}$ in bass drivers, one  $2\frac{3}{4}$ in tweeter. FR: 60Hz-18kHz. HC: 10W. Impedance: 4 ohms. Finish: Canadian nut. Size:  $6 \times 7 \times 10\frac{1}{2}$ in. Weight: 7lb. Price: £12.97 (no PT).

**ARS740**

Infinite baffle enclosure with units. Two  $7\frac{1}{4}$ in bass drivers, one  $5\frac{1}{4}$ in mid-range unit, one  $2\frac{3}{4}$ in tweeter. FR: 50Hz-18kHz. HC: 25W. Impedance: 8 ohms. Finish: Canadian nut. Size:  $14 \times 10 \times 24\frac{3}{4}$ in. Weight: 29lb. Price: £22.97 (no PT).



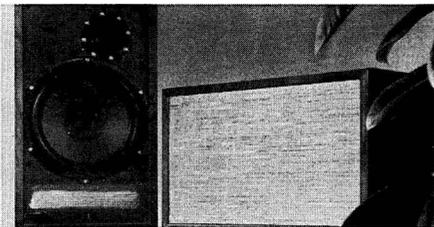
*Duette ARS710*

■ **DYNACO**

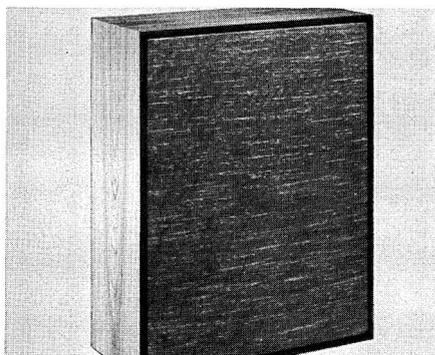
Distributors: Howland-West Ltd, 2 Park End, South Hill Park, London, NW3. Tel: 01-794 6666 and 6033.

**Dynaco A25 Mk II ★**

Speaker enclosure with 10in high compliance unit and two  $1\frac{1}{2}$ in dome tweeters. Crossover: 1,500Hz. FR: 32Hz-20kHz. HC 35W RMS. vci: 8 ohms. Dimensions:  $20 \times 11\frac{1}{2} \times 10$ in.



*Dynaco A25 Mk II*



Dynaco A50

Weight: 22lb. Finish: teak, walnut, rosewood. Price: £32 (no PT).

**Dynaco A50 ★**

Type of infinite baffle with two 10in bass drivers and one dome tweeter. FR: 25Hz-20kHz. Handling capacity 40W. Impedance: 8 ohms. Size:  $21\frac{1}{2} \times 27\frac{1}{4} \times 9\frac{3}{4}$ in. Finish: teak. Price: £66.

■ DYNASTATIC See Audio Services.

■ DYNATRON RADIO LTD

St Peters Road, Furze Platt, Maidenhead, Berks. Tel: Maidenhead 23331.

**LS1034 ★**

Shelf mounting infinite baffle enclosure with units. One  $6\frac{1}{2}$ in bass driver, two  $3\frac{3}{8}$ in tweeters. Impedance: 4 ohms. Size:  $13\frac{7}{8} \times 7\frac{1}{2} \times 10\frac{1}{4}$ in. Price: £14-50.

**LS1434 ★**

Shelf mounting infinite baffle enclosure with units. One 8in bass driver, two  $3\frac{3}{8}$ in tweeters. Impedance: 4 ohms. Size:  $19\frac{3}{4} \times 11\frac{7}{8} \times 10\frac{1}{4}$ in. Price: £16-50.

**LS1636**

Infinite baffle enclosure with units. One 8in bass driver, one 3in mid-range unit and one  $3\frac{3}{8}$ in tweeter. HC: 15W RMS. FR: 30Hz-18kHz. Impedance: 8 ohms. Finish: teak. Size:  $19\frac{3}{4} \times 11 \times 9\frac{1}{2}$ in. Price: £25.

**LS1734 ★**

Infinite baffle enclosure with units and crossover. One 8in bass driver, two  $3\frac{3}{8}$ in tweeters. Choke/capacitor crossover. FR: 40Hz-16kHz. HC: 10W RMS. Impedance: 4 ohms. Finish: white spray finish. Matches Dynatron HFC36 and fits stand ST20. Size:  $19\frac{3}{4} \times 11\frac{7}{8} \times 10\frac{1}{4}$ in. Price: £16-50.

**LS2034**

Reflex enclosure with units. One 8in bass driver, two  $3\frac{3}{8}$ in tweeters. FR: 35Hz-18kHz. HC: 10W RMS. Impedance: 4 ohms. Floor-standing design in teak with padded front. Size:  $26\frac{7}{8} \times 10\frac{1}{4} \times 15\frac{1}{2}$ in. Price: £21-50.

**LS3034 ★**

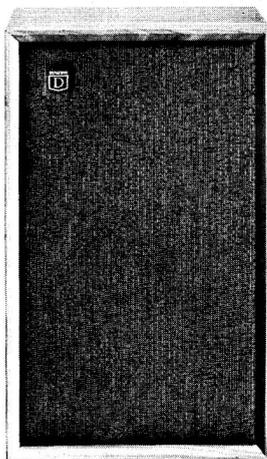
Infinite baffle enclosure with units. One 8in bass driver, two  $3\frac{3}{8}$ in tweeters. Impedance: 4 ohms. Size:  $26\frac{1}{2} \times 14\frac{3}{8} \times 12$ in. Price: £27-50.

**LS2504**

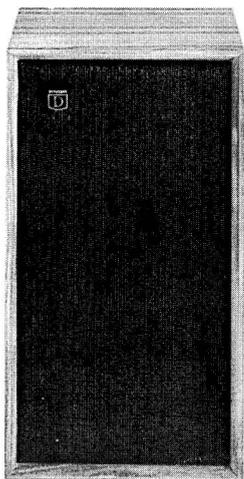
Floor-standing infinite baffle enclosure with units and crossover. One 12in bass driver and one 3in mid-range and HF unit. High-pass filter. Impedance: 4 ohms. Size:  $27 \times 16\frac{3}{4} \times 12$ in. Finish: walnut with Queen Anne style legs. Price: £32.

**LS2804**

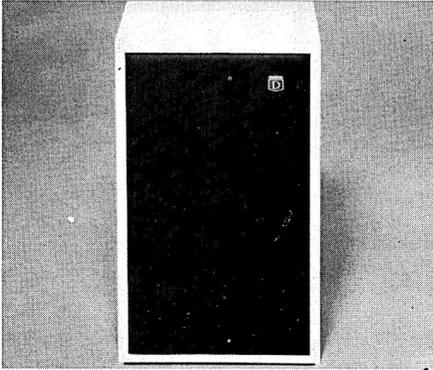
Similar specification to the LS2504 but with mahogany finish and square legs. Price: £32.



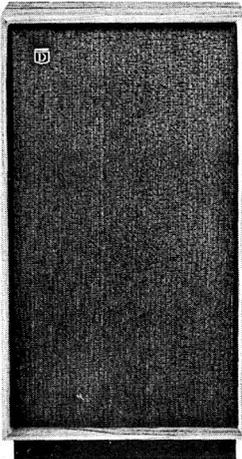
Dynatron LS1034



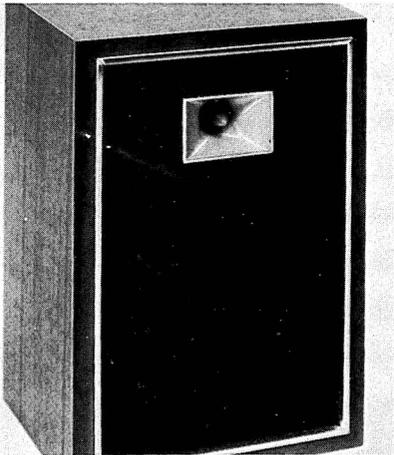
Dynatron LS 1434



*Dynatron LS1734*



*Dynatron LS3034*



*Eagle DL67*

**LS4038**

Reflex enclosure with units. Floor-standing design. One 12in bass driver, one 5in mid-range unit, one 1in tweeter. HC: 35W RMS. FR: 25Hz-20kHz. Impedance: 8 ohms. Padded front. Price: £42.

■ **EAGLE INTERNATIONAL**

Heather Park Drive, Wembley, HAI 1SU.  
Tel: 01-903 0144.

**DL.42**

Infinite baffle enclosure. FR: 40Hz-20kHz. HC 5W RMS. One 4in high compliance unit and one horn tweeter. vci: 8 ohms. Size: 10 × 6 × 6½in. Finish: teak and black front. Price: £9-50 (plus £2-45 PT).

**DL.67 ★**

Infinite baffle enclosure. FR: 35Hz-20kHz. HC 10W RMS. One 6½in high compliance unit and one horn tweeter. vci: 8 ohms. Size: 11¼ × 8 × 6¾in. Finish: teak and black front. Price: £15-80 (including PT).

**DL50**

Infinite baffle enclosure. FR: 40Hz-19kHz. HC: 5W RMS, 10W peak. Impedance: 8 ohms. Size: 14¼ × 8¾ × 6½in. Finish: oiled teak with charcoal grey grille. Price: (matched pair) £19-60 (including PT).

■ **EATON AUDIO FITMENTS**

Leopold Street, Long Eaton,  
Nottingham, NG104QF.  
Tel: Long Eaton 2662/2818.

**Trent 8**

Corner reflex enclosure based on Goodmans design, suitable for any full-range 8in drive unit. ¾in acoustic chipboard. Veneered in walnut, mahogany, oak or teak. Supplied in kit form. Size: 25½in high, 21½in wide, 14in back to front. Price: (teak) £9-95. Legs 45p extra.

**Trent 10**

Similar to Trent 8 but designed for 10in units. Supplied in kit form. Size: 31½in high, 25in wide, 15½in back to front. Also suitable for Celestion CX1512 and CX2012. Price: (teak) £11-20. Legs 45p extra.

**Derwent**

Bass reflex enclosure based on Wharfedale design. Two cubic feet. Supplied as kit. Suitable for any 8 or 10in full range units and certain 12in dual systems. Size: 28 × 16 × 10½in. Price: (teak) £9-90.

**Erewash 8**

One cubic foot enclosure based on Wharfedale design. Veneered on all sides. Supplied in kit form. Constructed from ½in material. Suitable any 8in full-range unit and smaller dual systems. Produced in reflex or infinite baffle version.

★ Indicates entry is illustrated

Cabinets built to customers' own designs and quotations given. Standard kits include eight enclosures (five free-standing and three book-shelf). Supplied in kit form accurately machined ready for simple assembly. All kits are complete with fret material, loose fret, bolts, screws and lagging material as required. Wood is veneered but unpolished.

#### **Mullard Unilex system**

Cabinets suitable for the Mullard Unilex stereo system available. Full details and prices on request.

#### **■ ELAC**

Electro Acoustic Industries Ltd,  
Stamford Works, Broad Lane, London, N15.  
Tel: 01-808 0505/9. Cables: Elac, London, N15.

#### **Elac E6-S**

Infinite baffle compact enclosure with unit. Wide-range 6in speaker with long-throw suspension and moulded rubber surround of new design. FR: 55Hz-16kHz. HC 10W. vci: 8 and 15 ohms. Size: 11 × 8 × 6in. Weight: 7lb. Finish: scratch resistant simulated teak or walnut. Price: £8.90 (plus £2.10 PT).

#### **■ J. J. FRANCIS (Wood Green) LTD**

123 Alexandra Road, Hornsey, London, N8.  
Tel: 01-888 1662.

#### **Countdown ★**

Infinite baffle speaker enclosure. Two units: 3 $\frac{3}{4}$ in tweeter and 6 $\frac{1}{2}$ in long-throw low frequency. Crossover: 1kHz half-section. FR: 50Hz-20kHz. HC 10W RMS. vci: 4-15 ohms. Dimensions: 14 × 10 × 6in. Weight: 7lb 6oz. Finish: solid teak wood. Internal damping with Dr Bailey's long fibre wool. Price: £12 (including tax).

#### **■ GOODMANS LOUDSPEAKERS LTD**

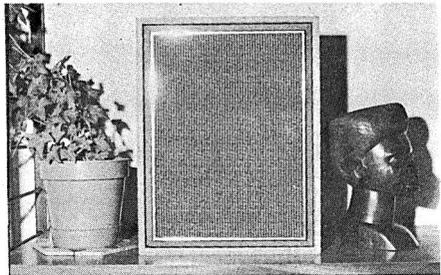
Downley Road, Havant, Hampshire, PO92NL.  
Tel: Havant 6344. Telex: 86296.

#### **Maxim 2**

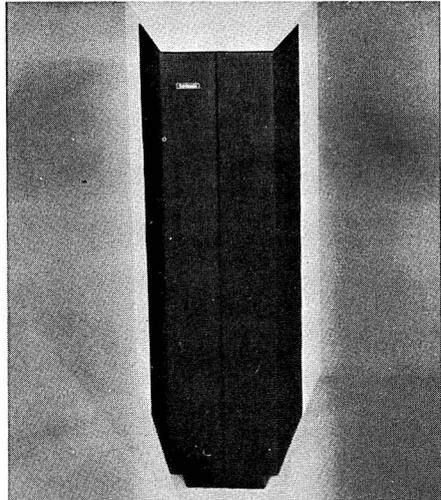
Infinite baffle enclosure with units and crossover. Two 4in bass drivers, one 1in dome HF tweeter. Crossover: 5kHz. FR: 40Hz-22kHz (DIN 45:500). HC: 25W (DIN). Minimum power: 10W. Interior volume: 9 litres. Impedance: 4 ohms. Finish: teak, walnut or white. Size: 17 $\frac{3}{4}$  × 6 $\frac{1}{2}$  × 7 $\frac{1}{2}$ in. Weight: 11lb. DIN connector with cable. Price: to be announced.

#### **Havant**

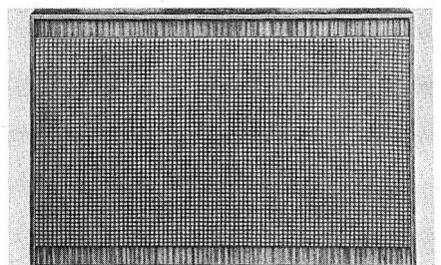
Reflex enclosure with units and crossovers. One 8in bass driver, one 3 $\frac{3}{4}$ in mid-range unit, one 1 $\frac{1}{2}$ in dome tweeter. Crossovers: 800Hz and 3kHz. Interior volume: 18 litres. FR: 45Hz-22kHz (DIN 45:500). HC: 20W (DIN). Minimum power: 10W. Impedance: 4 ohms. Finish:



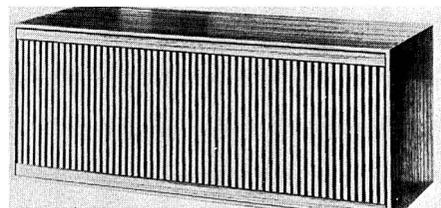
*Francis Countdown*



*Goodmans Dimension 8*



*Grundig System 304*



*Grundig System 525*

teak, walnut or white. Size:  $19 \times 10\frac{1}{2} \times 10\frac{1}{2}$ in. Weight: 18½lb. DIN connector with cable. Price: to be announced.

### Mezzo 3

Infinite baffle enclosure with units and crossover. One 12in bass driver, one sealed back 4in tweeter. Crossover: 2kHz. FR: 40Hz-22kHz. HC: 30W (DIN). Impedance: 8 ohms. Size:  $19\frac{1}{2} \times 12\frac{1}{4} \times 9\frac{1}{4}$ in. Finish: teak or walnut. Price: £34.

### Magnum K2

Infinite baffle enclosure with units and crossovers. One 12in bass driver, back-loaded mid-range unit, 1in dome tweeter. Crossover: 800Hz and 5kHz. FR: 30Hz-22kHz. HC: 40W (DIN). Impedance: 4-8 ohms. Air cushion suspension to bass unit. Size:  $24 \times 15 \times 11\frac{3}{8}$ in. Finish: teak or walnut. Price: £44.

### Magister

Infinite baffle enclosure with three units and crossovers. One 15in bass driver, one 4in mid-range unit, one 1in dome tweeter. Crossovers: 800Hz and 5kHz. FR: 26Hz-22kHz. HC: 50W RMS. Impedance: 4-8 ohms. Finish: teak or walnut. Size:  $27 \times 20 \times 14\frac{1}{4}$ in. Price: £62.50.

### Minister

Floor-standing enclosure with units and crossover. Bass driver with plastic coated and suspended diaphragm, dome type tweeter. HC: 20W RMS. Impedance: 4-8 ohms. FR: 45Hz-22kHz. Finish: teak or walnut. Size:  $19 \times 10\frac{1}{2} \times 10$ in. Supplied in matched pairs. Price: (per pair) £50.

### Dimension-8★

Mass-loaded reflex enclosure with units and crossovers. One 12½in bass driver, four 5½in bass drivers, two 4½in mid-range units, two 1in dome tweeters. Crossovers: 80Hz, 800Hz, 4kHz. FR: 30Hz-22kHz (DIN 45:500). HC: 60W. Minimum amplifier power: 10W. Interior volume: 40 litres. Impedance: 4 ohms. Finish: teak, walnut or white. Size:  $30\frac{1}{2} \times 14 \times 12\frac{1}{2}$ in. Weight: 44lb. Price: to be announced.

## ■ GRUNDIG (Great Britain) LTD

15 Orchard Street, London, W1.

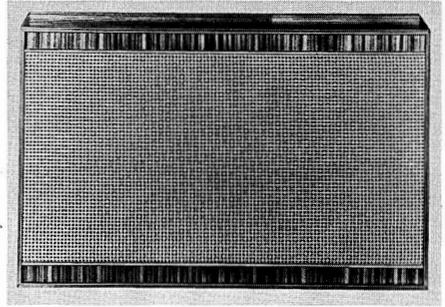
Tel: 01-935 4898.

### System 304 ★

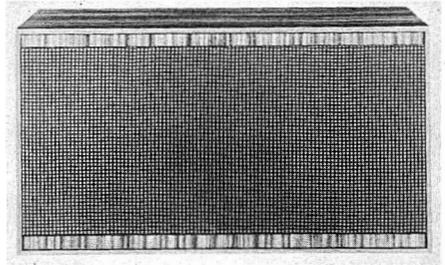
Three-unit enclosure with crossover. HC: 20W RMS. Two bass/mid-range drivers, one HF dome tweeter. FR: 50Hz-20kHz. vci: 5 ohms.  $20 \times 13\frac{1}{4} \times 3\frac{1}{2}$ in. Finish: matt walnut. Price: £64.

### System 525 ★

Four-unit enclosure. Two bass/mid-range drivers, two tweeters. HC: 35W RMS. FR: 40Hz-20kHz. vci: 5 ohms. Finish: matt walnut. Size:  $23 \times 9\frac{1}{2} \times 9\frac{1}{4}$ in. Price: (per pair) £100.



Grundig System 731



Grundig System 741

### System 731 ★

Six-unit enclosure. Two bass drivers, two mid-range units, two HF dome tweeters. HC: 50W RMS. FR: 40Hz-20kHz. vci: 5 ohms. Finish: matt walnut. Size:  $24\frac{1}{2} \times 15\frac{1}{4} \times 5\frac{1}{2}$ in. Price: (per pair) £112.

### System 741 ★

Six-unit enclosure with crossover. Two bass drivers, two mid-range units, two HF dome tweeters. HC: 50W RMS. FR: 40Hz-20kHz. vci: 5 ohms. Size:  $26 \times 14\frac{1}{2} \times 10$ in. Finish: matt walnut. Price: (per pair) £138.70.

### Troika 4012

Comprises two separate omni-directional tweeter systems and one bass enclosure. Two drivers in bass enclosure, six tweeters in each treble enclosure. HC: 30W RMS. FR: 40Hz-20kHz. vci: 5 ohms. Finish: matt walnut. Sizes: bass enclosure  $24\frac{1}{2} \times 16 \times 5\frac{1}{2}$ in; treble enclosures  $5\frac{1}{2} \times 5\frac{1}{2} \times 5\frac{1}{2}$ in. Price: (complete system) £94.70.

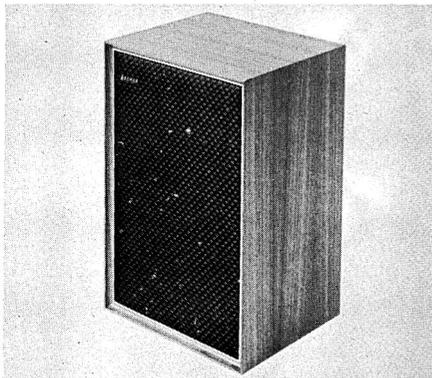
### Troika 4022

Similar specification to Troika 4012 but with bass enclosure of different dimensions. Size of bass enclosure:  $23 \times 9\frac{1}{2} \times 9$ in. Price: (complete system) £96.

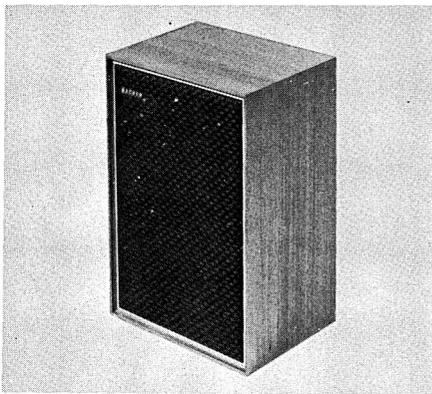
## ■ HACKER RADIO LTD

Norveys Drive, Cox Green, Maidenhead, Berks.  
Tel: Maidenhead 22261/5.

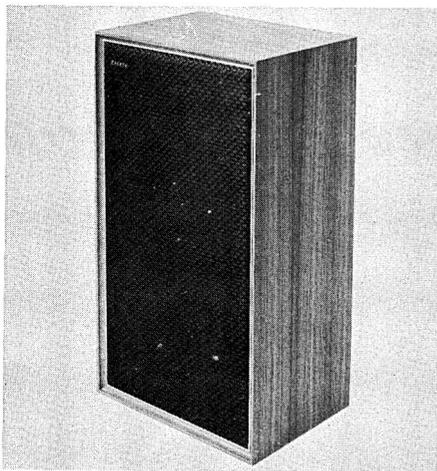
★ Indicates entry is illustrated



Hacker LS500



Hacker LS1000B



Hacker LS1500

**LS500 ★**

Infinite baffle enclosure with units. One 8in bass driver, two 3in tweeters. Impedance: 8 ohms. Size:  $10\frac{1}{2} \times 16\frac{1}{2} \times 8\frac{1}{2}$ in. Finish: teak veneer with chocolate brown basket weave fabric grille. Price: £18 (no PT).

**LS1000B ★**

Infinite baffle enclosure with units. One 8in bass driver, one 5in mid-range unit, one 3in tweeter. Impedance: 15 ohms. Size:  $13\frac{1}{4} \times 20 \times 11\frac{1}{4}$ in. Finish: teak veneer with chocolate brown basket weave fabric grille. Price: £27 (no PT).

**LS1500 ★**

Tuned port enclosure with units. One 12in bass driver, one 5in mid-range unit, one 3in domed tweeter. Impedance: 15 ohms. Size:  $15\frac{1}{2} \times 30 \times 12$ in. Finish: teak veneer with chocolate brown basket weave fabric grille. Price: £44 (no PT).

■ **HEATHKIT** See Constructional Kits Section.

■ **HECO**

Distributors: Acoustico Enterprises Ltd, 6-8 Union Street, Kingston-upon-Thames, Surrey. Tel: 01-549 3471/3.

**SM20 ★**

Infinite baffle enclosure with two units. One 7in bass driver, one  $4 \times 2\frac{3}{4}$ in tweeter. Crossover: 1.9kHz. FR: 48Hz-20kHz (DIN). HC: 20W RMS. Impedance: 8 ohms. Size:  $18 \times 11 \times 4\frac{3}{8}$ in. Weight:  $10\frac{3}{8}$ lb. Finish: teak, rosewood, oak or white. Price: £26.

**SM25 ★**

Infinite baffle enclosure with units. One 8in bass driver, one  $4 \times 2\frac{3}{4}$ in tweeter. Crossover: 2kHz. FR: 45Hz-20kHz (DIN). HC: 25W RMS. Impedance: 8 ohms. Size:  $18 \times 9\frac{3}{4} \times 8$ in. Weight: 14 $\frac{1}{2}$ lb. Finish: teak, rosewood, oak, white. Price: £32.

**SM35 ★**

Infinite baffle enclosure with units. 9 $\frac{3}{8}$ in bass driver, 5in mid-range unit,  $4 \times 2\frac{3}{4}$ in tweeter. Crossover: 650Hz, 1.9kHz. FR: 40Hz-20kHz (DIN). HC: 35W RMS. Impedance: 8 ohms. Size:  $19 \times 11 \times 9\frac{3}{8}$ in. Weight: 21lb. Finish: teak, rosewood, oak or white. Price: £36.

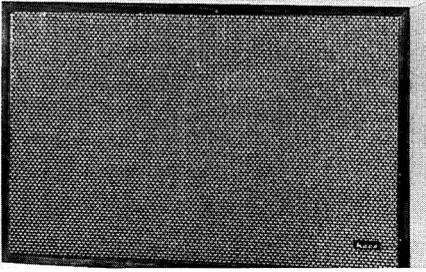
**P1000 ★**

Infinite baffle enclosure with units. 5in bass driver, 1in dome tweeter. Crossover: 2kHz. FR: 45Hz-25kHz (DIN). HC: 30W RMS. Impedance: 8 ohms. Size:  $21 \times 12\frac{3}{4} \times 3\frac{3}{8}$ in. Weight: 20lb. Finish: teak, rosewood, oak or white. Price: £32.

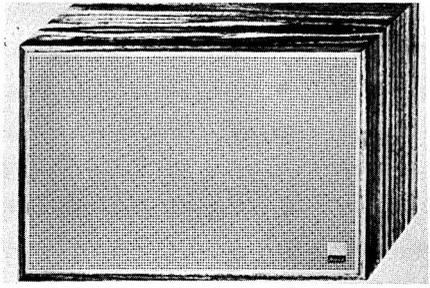
**P2000 ★**

Infinite baffle enclosure with units. 7in bass driver, 1in dome tweeter. Crossover: 2kHz. FR: 42Hz-25kHz (DIN). HC: 30W RMS. Im-

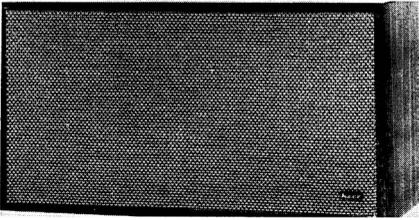
**SPEAKER ENCLOSURES**



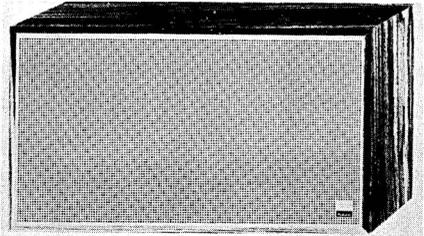
*Heco SM20*



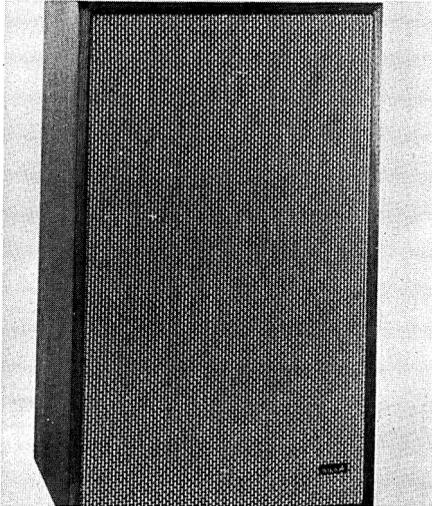
*Heco P2000*



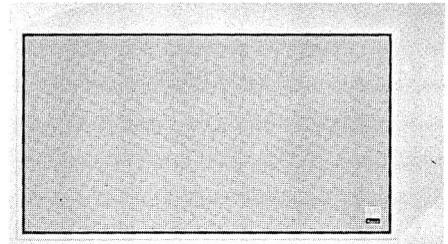
*Heco SM25*



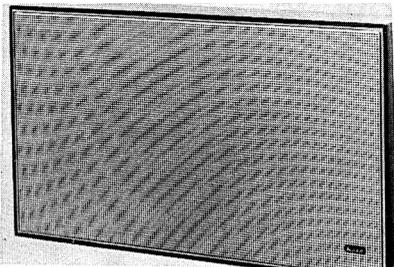
*Heco P3000*



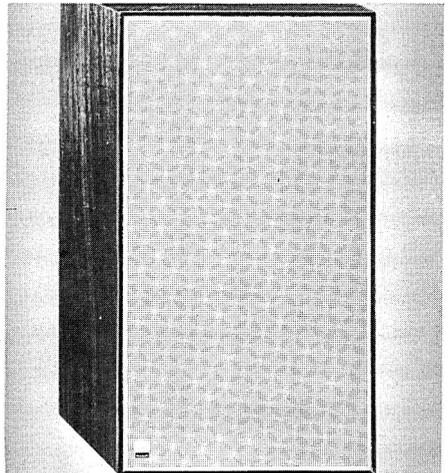
*Heco SM35*



*Heco P4000*

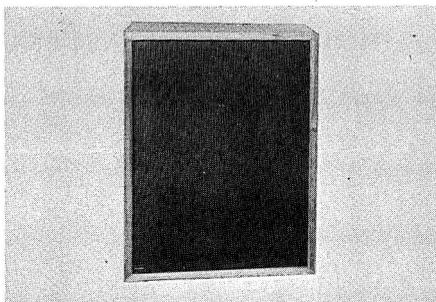


*Heco P1000*

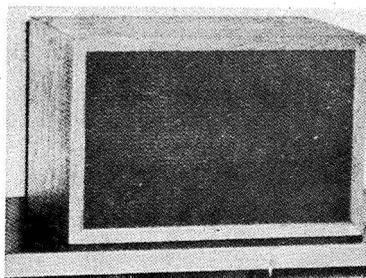


*Heco P5000*

★ Indicates entry is illustrated



Howland-West Narvik



Howland-West Bergen

pedance: 8 ohms. Size:  $13\frac{1}{2} \times 8\frac{3}{4} \times 7$ in. Weight: 16½lb. Finish: teak, rosewood, oak or white. Price: £38.

**P3000 ★**

Infinite baffle enclosure with units. 7in bass driver, 4in mid-range unit, 1in dome tweeter. Crossover: 800Hz, 2-5kHz. FR: 40Hz-25kHz (DIN). HC: 35W RMS. Impedance: 8 ohms. Size:  $15\frac{3}{4} \times 8\frac{3}{4} \times 7$ in. Weight: 18½lb. Finish: teak, rosewood, oak or white. Price: £40.

**P4000 ★**

Infinite baffle enclosure with units. 8in bass driver, 1½in mid-range unit, 1in dome tweeter. Crossover: 800Hz, 3kHz. FR: 30Hz-25kHz (DIN). HC: 40W RMS. Impedance: 8 ohms. Size:  $18 \times 10 \times 8$ in. Weight: 24½lb. Finish: teak, rosewood, oak or white. Price: £48.

**P5000 ★**

Infinite baffle enclosure with units. 9½in bass driver, 5in mid-range unit, 1½in tweeter, 1in dome super tweeter. Crossover: 250Hz, 800Hz, 3kHz. FR: 25Hz-25kHz (DIN). HC: 50W RMS. Impedance: 8 ohms. Size:  $23\frac{1}{2} \times 12\frac{5}{8} \times 9\frac{3}{4}$ in. Weight: 46lb. Finish: teak, rosewood, oak or white. Price: £75.

**P6000**

Infinite baffle enclosure with units. 12in bass

driver, 5in mid-range unit, 1½in tweeter, 1in dome super tweeter. Crossover: 250Hz, 800Hz, 3kHz. FR: 20Hz-25kHz (DIN). HC: 60W RMS. Impedance: 8 ohms. Size:  $31 \times 14 \times 10\frac{1}{2}$ in. Weight: 57lb. Finish: teak, rosewood, oak or white. Price: £110.

■ **THOMAS HEINITZ**

35 Moscow Road, Queensway, London, W2.  
Tel: 01-229 2077.

**C.Q. Junior**

Controlled Q reflex enclosure. Special Goodmans  $10 \times 6$ in unit. FR: 45Hz-15kHz, depending on unit. Finishes: teak, walnut, mahogany, all-white (others to order at no extra charge). Size:  $16\frac{1}{2} \times 9\frac{1}{2} \times 9\frac{1}{4}$ in. Weight: 7lb. Price: £10-55.

■ **HITACHI SALES (UK) LTD**

Park House, Coronation Road, Park Royal, London, NW97QS.  
Tel: 01-965 9861. Telex. 932268.

New range of speaker enclosures being introduced shortly. Details of prices and specifications not available at time of going to press.

■ **HOWLAND-WEST LTD**

2 Park End, South Hill Park, London, NW3.  
Tel: 01-794 6666/6033.

**Narvik ★**

Infinite baffle enclosure with speakers. 12in bass driver, mid-range unit and tweeter. Crossover network included. FR: 35Hz-22kHz. HC 25W. Size:  $23\frac{1}{2} \times 17\frac{3}{4} \times 12$ in. Weight: 32½lb. Finish: teak. Price: £29-75.

**Bergen ★**

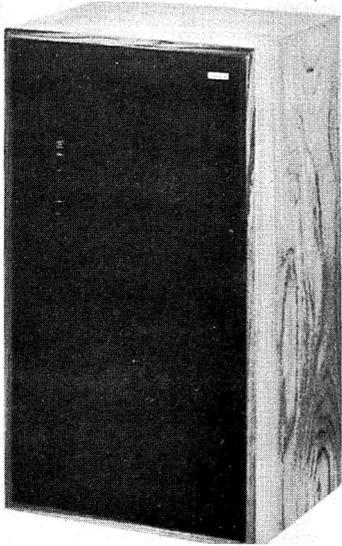
Infinite baffle enclosure with speakers. 6½in high compliance bass driver and tweeter. FR: 50Hz-22kHz. HC 12W. Size:  $13\frac{3}{4} \times 9 \times 8\frac{3}{8}$ in. Weight: 10½lb. Finish: teak. Price: £13-50 (plus £3-29 PT).

■ **IMF PRODUCTS (GB)**

62-68 Silver Street, Reading, Berks.  
Tel: Reading 861471.

**IMF Studio (export)**

Transmission line enclosure with four units and crossover. 8in plastic cone bass driver, 5in mid-range unit in separate line, 1½in tweeter with chemical diaphragm, ¾in super tweeter with chemical dome. Four-way crossover at 375Hz, 3-5kHz and 13kHz. FR: 25Hz to beyond audibility. Driving power: 20-60W RMS. Impedance: 8 ohms. Size:  $36 \times 14 \times 15$ in. Calibrated level controls ( $\pm 2$ dB) for mid- and high-frequencies. Finish: supplied in matched 'mirror image' pairs in teak or walnut. Weight: 68lb each. Price: £79-75



Imhof Junior Mk II

**IMF Monitor**

Transmission line enclosure with four units and crossover. 13 × 9½ in flat polystyrene diaphragm bass driver, 6in plastic cone mid-range unit, 1½ in tweeter with chemical diaphragm, ¾ in super tweeter with chemical dome. Four-way crossover at 375Hz, 3.5kHz and 13kHz. FR: 20Hz to beyond audibility. Driving power: 25-60W RMS. Impedance: 8 ohms. Size: 40 × 17½ × 19¾ in. Mounted on castors. Weight: 120lb. Finish: supplied in matched 'mirror image' pairs in teak or walnut (other finishes to order). Price: £116.

**IMF Monitor (export)**

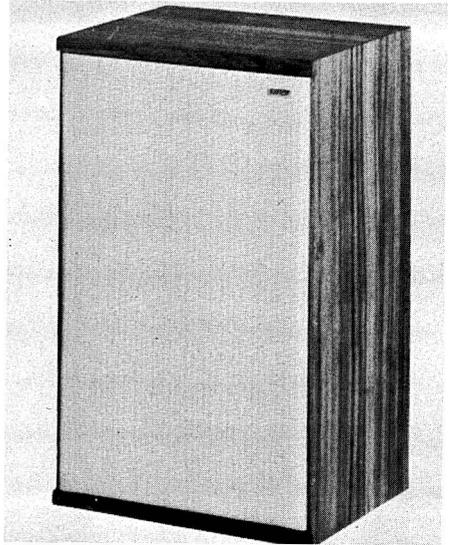
Same specification as the Monitor but with the addition of separate calibrated level controls providing ±2dB for mid- and high frequencies. Price:

**IMF Professional**

Similar specification as the Monitor but with high-power crossover allowing use of up to 100W amplifiers. FR: 17Hz to beyond audibility. Made from high density material and finished in plastic laminate. Size: 42 × 17½ × 19¾ in. Fitted with castors. Handles optional extra. Supplied to order in matched 'mirror image' pairs. Finishes include natural wood laminates, wood facimile laminates and standard plain colours. Weight: approx 140lb. Price: £150-£160.

**IMF Professional Studio**

As Export Studio but with higher power handling crossover and fully laminated finish. Handles



Imhof IM.100

and castors optional extras. Weight: 70lb. Price: from £97.50.

**Calrec/IMF Monitor**

Transmission line enclosure with single Tannoy 12in unit. Size 42 × 17½ × 19¾ in. Weight: 135lb. Fitted castors and handles. Finish: laboratory grey plastic laminate with aluminium trim. Price: to be announced.

**IMHOFS LTD**

112-116 New Oxford Street, London, WC1.  
Tel: 01-636 7878.

**Junior Mk II ★**

Infinite baffle enclosure with units. 13 × 8in bass driver, 3in treble unit. Crossover 5kHz. FR: 50Hz-20kHz. HC: 10W RMS. Impedance: 8 ohms. Finish: teak veneer with black fabric grille. Size: 12½ × 24 × 9¾ in. Weight: 15lb. Price: £16-80.

**IM.100 ★**

Infinite baffle enclosure with units. 13 × 8in bass driver, 1½ in treble unit. Crossover 1kHz. FR: 50Hz-20kHz. HC: 15W. Impedance: 8 ohms. Finish: teak or walnut veneer. Size: 11¾ × 19 × 7½ in. Weight: 15lb. Interchangeable fabric grilles in a variety of patterns. Price: (teak or walnut) £25-90; (slatted front, in teak only) £28-40.

**IM.200**

Infinite baffle enclosure with units. 13 × 9in bass driver, 1½ in treble unit. Crossover 1kHz. FR:

★ Indicates entry is illustrated

40Hz-20kHz. HC: 25W. Impedance: 8 ohms. Finish: teak or walnut veneer to choice. Size:  $15\frac{1}{2} \times 24\frac{1}{2} \times 10\frac{1}{2}$ in. Weight: 28lb. Interchangeable fabric grilles in a variety of patterns. Price: (teak or walnut) £38-85.

#### ■ ITT-KB

Consumer Products Division, Footscray, Sidcup, Kent. Tel: 01-300 7733.

#### KS654

Infinite baffle enclosure with special  $18 \times 8$ in bass driver,  $6 \times 4$ in mid-range unit in separate compartment, cone tweeter with sealed back. Crossover: 500Hz and 2.5kHz. HC: 10W. Impedance: 4 ohms. FR: 40Hz-15kHz  $\pm 5$ dB. Size:  $28 \times 16 \times 9$ in (including plinth). Finish: teak veneer with grey fabric speaker grille and black plinth. Price: £31-50.

#### ■ JORDAN-WATTS

Distributors: Boosey and Hawkes (Sales) Ltd, Sonorous Works, Deansbrook Road, Edgware, Middlesex. Tel: 01-952 7711.

#### Jumbo ★

Infinite baffle. Power handling 12W. Forward facing. Shelf or wall mounting. Incorporates one Jordan-Watts modular unit. FR: 80Hz-20kHz. Size:  $16\frac{1}{2} \times 8 \times 3\frac{1}{2}$ in. Weight: 13lb. Finish: teak. Price: £18-50.

#### Janet

Infinite baffle. One full-range Jordan-Watts module. FR: 70Hz-20kHz. HC 12W RMS. Compact shelf-mounting full range speaker system. Finish: teak with green Vynair. Size:  $12 \times 8 \times 6\frac{1}{2}$ in. Weight: 13lb. Price: £18-50.

#### Juno ★

Reflex enclosure. Power handling 12W. Forward facing. Incorporates one Jordan-Watts modular unit. FR: 40Hz-20kHz. Size:  $24\frac{1}{2} \times 12\frac{1}{2} \times 6\frac{1}{2}$ in. Weight: 27lb. Price: £25-50.

#### Juliet

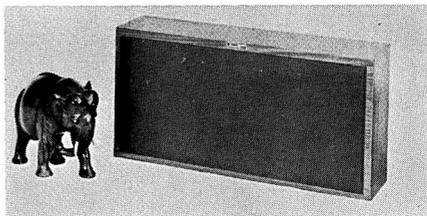
Reflex cabinet. One full-range Jordan-Watts module. FR: 40Hz-20kHz. HC 12W RMS. Compact shelf-mounting full range speaker system. Finish: teak with green Vynair. Size:  $16 \times 10 \times 9$ in. Weight: 28lb. Price: £25-50.

#### Gemini ★

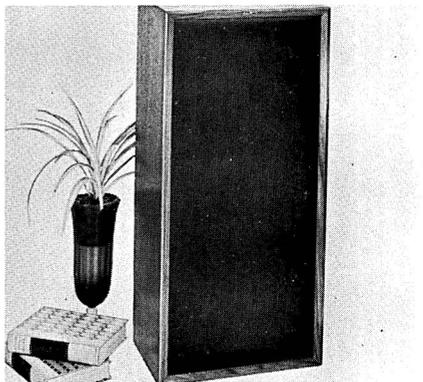
Reflex enclosure. Power handling 25W. Forward facing. Incorporates two Jordan-Watts modular units. FR: 40Hz-20kHz. Size:  $30 \times 13\frac{1}{2} \times 7\frac{1}{2}$ in. Weight: 50lb. Price: £39-75.

#### Jupiter ★

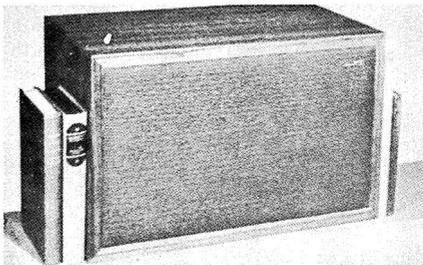
Reflex enclosure. Power handling 25W. Forward facing. Incorporates two Jordan-Watts modular units. FR: 20Hz-20kHz. Size:  $34 \times 5 \times 10\frac{1}{2}$ in. Weight: 70lb. Price: £54-50.



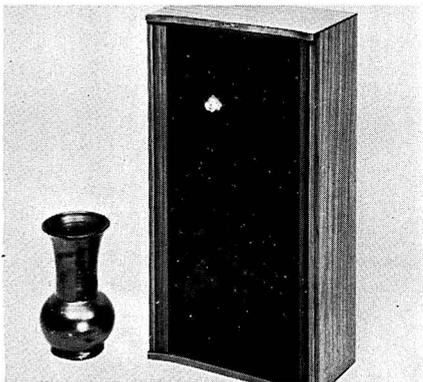
Jordan-Watts Jumbo



Jordan-Watts Gemini



Jordan-Watts Jupiter



Jordan-Watts Juno

## ■ KEF ELECTRONICS LTD

Tovil, Maidstone, Kent.

Tel: Maidstone 57258. Cables: KEF, Maidstone.

### Cresta II

Compact two-unit enclosure. 6in bass driver, 1in tweeter. Integrated electrical crossover at 3.5kHz. HC 15W. FR 45Hz-30kHz. Impedance: 8 ohms. Size:  $12\frac{1}{2} \times 7\frac{1}{2} \times 8\frac{3}{8}$ in. Finish: teak, walnut or white. Price: £20.85 (plus £5.08 PT).

### Chorale ★

Compact model in choice of walnut, teak or white. Size:  $18\frac{1}{2} \times 11 \times 8\frac{5}{8}$ in. B200 and T27 units. HC 20W. FR 35Hz-30kHz. Impedance: 8 ohms. Price: £28.50 (plus £6.95 PT).

### Celeste

Compact model in choice of walnut or teak with brown or white grille cloth. Size:  $18 \times 10\frac{1}{2} \times 6\frac{1}{2}$ in. HC 20W. FR 40Hz-20kHz. Impedance: 8 ohms. Price: £30.

### Concord

Walnut or teak with black metal grille. Size:  $24 \times 15 \times 10$ in. B139 and T15 units. HC 25W. FR 35Hz-20kHz. Impedance: 8 ohms. Price: £43.50.

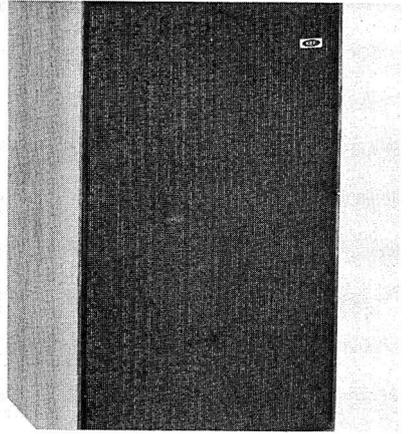
### Cadenza

Reflex design in walnut, teak or white with brown, grey or beige grille cloth. Size:  $24 \times 14 \times 12$ in. B200, D300 and T27 units. HC 35W. FR 35Hz-30kHz. Impedance: 8 ohms. Price: £42.50.

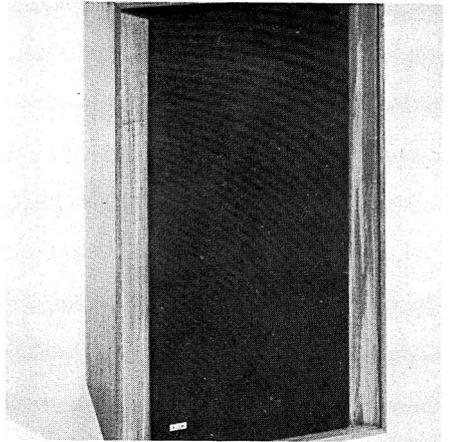
### Concerto ★

Reflex design in walnut, teak or white. Size:  $28 \times 17 \times 12$ in. B139, B110 and T27 units. HC 30W. FR 30Hz-30kHz. Impedance: 8 ohms. Price: £58.50.

See also Constructional Kits section for Kefkits.



KEF Chorale



KEF Concerto

## ■ KF PRODUCTS LTD

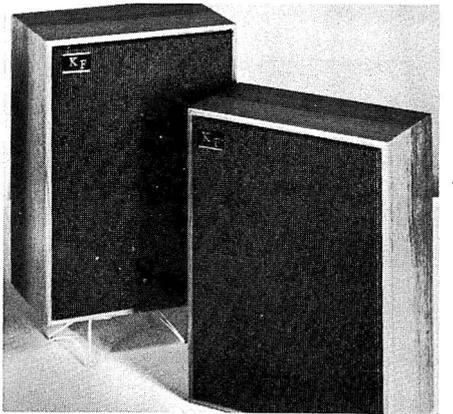
Brookfield House, Hopes Carr, Stockport, Cheshire. Tel: 061-480 7428 and 1761.

### PF8-S ★

Infinite baffle enclosure with single unit. One 8in dual-cone, high-flux full-range unit with ceramic magnet and long-throw bass driver. FR: 80Hz-17kHz. HC: 8W RMS. Impedance: 8 or 15 ohms. Finish: teak veneer with matching Vynair front grille. Size:  $15 \times 10\frac{1}{2} \times 5\frac{3}{4}$ in. Price: £7.32 (plus £1.78 PT).

### E138S ★

Infinite baffle enclosure with single unit. One EMI 13 × 8in dual-cone driver. FR: 75Hz-13 kHz. HC: 10W RMS. Impedance: 3, 8 or 15 ohms. Finish: teak veneer with matching Vynair front grille. Size:  $18 \times 13\frac{1}{2} \times 9$ in. Packed in matched pairs for stereo. Price: (each speaker) £12.98 (no PT).



K.F. Products PF8/S

★ Indicates entry is illustrated

### LP6-S ★

Infinite baffle enclosure with unit. One 6½in dual-cone, long-throw unit with roll surround. FR: 65Hz-20kHz. HC: 10W RMS. Impedance: 8 ohms. Finish: teak veneer with matching Vynair front grille. Size: 13 × 8 × 10in. Packed in matched pairs for stereo. Price: (each speaker) £13-68½ (plus £3-26½ PT).

### LP12S

Reflex enclosure with single unit. One Goodmans Axiom 301 full-range twin-cone driver. FR: 40Hz-16kHz. HC: 20W RMS. Impedance: 8 or 16 ohms. Finish: teak veneer with matching Vynair front grille. Size: 24 × 15 × 11¼in. Price: £35 (no PT).

### ■ KELETRON

Kelgrove (Sales) Ltd, 25-31 Roman Road, London, E2. Tel: 01-980 7494/1936.

### KN500

Infinite baffle bookshelf enclosure with three drive units and crossovers. One 6½in twin-cone bass, one 4in mid-range, one 2in tweeter. HC: 5W RMS. Impedance: 8 or 16 ohms. FR: 65Hz-18-5kHz. Size: 12 × 7½ × 6¼in. Finish: teak. Price: £11-50.

### KN700

Infinite baffle shelf or floor standing enclosure with three drive units and crossovers. One 8in bass, one 4in treble, one 2in tweeter. HC: 7W RMS. Impedance: 8 or 16 ohms. FR: 45Hz-18-5kHz. Size: 17¼ × 10 × 7¼in. Finish: teak. Price: £13-75.

### KN1000

Infinite baffle floor standing enclosure with three drive units and crossovers. One 10in twin-cone bass, two 4in treble. HC: 10W. Impedance: 8 or 16 ohms. FR: 40Hz-19kHz. Size: 21 × 11½ × 9¼in. Finish: teak. Price: £19-25.

### KN1500

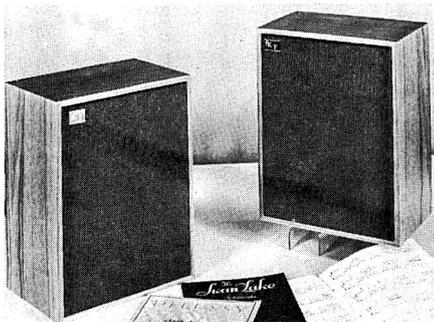
Infinite baffle floor standing enclosure with four drive units and crossovers. One 12in twin-cone, two 4in treble, one 3½in parasitic. HC: 15W RMS. Impedance: 8 or 16 ohms. FR: 30Hz-19kHz. Size: 21 × 15 × 7¼in. Finish: teak. Price: £24-75.

### KN2000

Infinite baffle floor standing enclosure with four drive units and crossovers. One 12in bass, two 4in treble, one 3½in parasitic tweeter. HC: 20W RMS. Impedance: 8 or 16 ohms. FR: 30Hz-19kHz. Size: 24 × 15 × 11¼in. Finish: teak. Price: £28-75.

### ■ KINGSTEREO

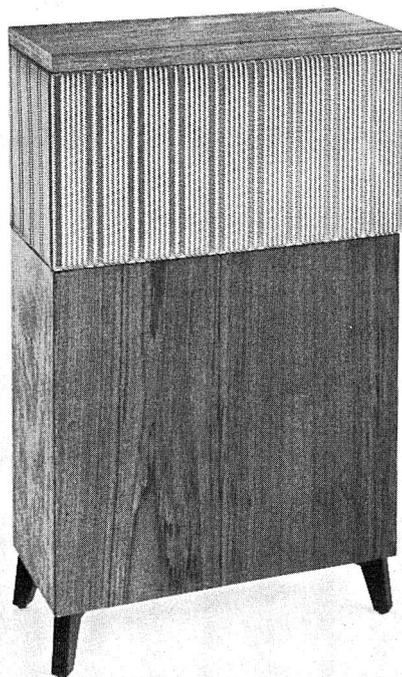
Distributors: Lionel Murray Ltd, 7 West Halkin Street, Belgrave Square, London, SW1. Tel: 01-235 6424-5-6.



KF Products EI 38-S



KF Products LP6-S



Kirkman Home Concert Hall Mk 2

Teak cabinet speaker enclosures. Price: £10 (including PT).

### ■ KIRKMAN (Crawley) LTD

40 The Broadway, Crawley, Sussex.  
Tel: Crawley 26670.

#### Home Concert Hall Mk 2 ★

Isothermal tapered reflex enclosure with speakers and crossover. Two Richard Allan CR5 bass units and STC 4001E tweeter. Two  $\frac{1}{4}$ -section crossovers at 3kHz and 4kHz. FR: 28Hz - 6dB; 20kHz - 3dB. HC: 20W music. Omni-directional throughout frequency range in horizontal plane. Inside and outside of enclosure employed to maintain non-resonant closely controlled acoustic load. Finish: teak with bronze grille. Size:  $31 \times 18 \times 8\frac{1}{2}$ in. Weight: 44lb. Price: £52.

### ■ KLEIN & HUMMEL

Sole UK agents: F. W. O. Bauch Ltd,  
49 Theobald Street, Boreham Wood, Herts.  
Tel: 01-953 0091.

#### K. & H. OY ★

Studio monitor speaker enclosure comprising two separate built-in 30W solid state bass and treble amplifiers and 4-unit drive system. Input: 0-775V and 1-55V at 4-7K to 500Hz dividing network filter. Speakers: 9in bass unit, two 5in mid-lift units and a 'top' horn. FR: 30Hz-20kHz. Complete equalisation controls for room and position matching. Dimensions:  $19 \times 12 \times 9$ in. Weight: 45lb. Finish: grey formica or walnut. Psn: mains. Price on application.

### ■ KLINGER CONTROLS LTD

Chalcot Centre, 7 Chalcot Road,  
London, NW1 8LU. Tel: 01-586 2922/3.

#### S24

Sealed enclosure with 5in bass drive unit and tweeter, with  $\frac{1}{4}$ -section crossover. HC: 10W, 15 ohms. Dimensions:  $13 \times 7 \times 8$ in. Price: (teak) £13-65; (rosewood) £15-75.

#### S32

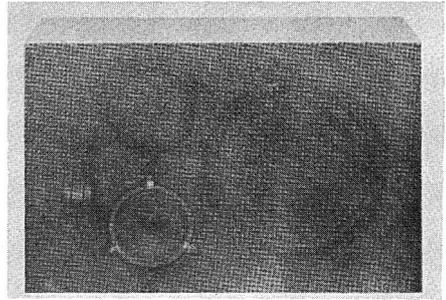
Sealed enclosure with  $8 \times 5$ in drive unit. HC: 5W, 15 ohms. Dimensions:  $13 \times 7 \times 8$ in. Teak finish. Price: £8-92 $\frac{1}{2}$ .

#### S40

Sealed enclosure employing  $8 \times 5$ in drive unit and tweeter, with  $\frac{1}{4}$ -section crossover. FR: 60Hz-18kHz. System resonance 120Hz. HC: 10W, 15 ohms. Dimensions:  $13 \times 7 \times 8$ in. Teak finish. Price: £10-50.

#### S42

Sealed enclosure with units.  $6\frac{1}{2}$ in bass driver,  $3\frac{1}{2}$ in and 2in tweeters. L/C crossover at 5kHz. FR: 40Hz-18kHz. HC: 12W RMS. Impedance:



*Klein and Hummel OY*

8 ohms. Size:  $17\frac{1}{2} \times 10 \times 8$ in. Weight: 9lb. Finish: teak with black/gold weave fabric grille. Price: £18-50.

#### S50

Reflex enclosure with units. 8in bass driver,  $3\frac{1}{2}$ in and 2in tweeters. L/C crossover at 5kHz. FR: 40Hz-18kHz. HC: 15W RMS. Impedance: 8 ohms. Size:  $18 \times 13 \times 7$ in. Finish: teak with chocolate-coloured basket weave grille and silver trim. Price: £20.

### ■ KORTING

Europa Electronics Ltd, Howard Place,  
Shelton, Stoke-on-Trent, ST1 4NW.  
Tel: Stoke-on-Trent 29316.

#### LSB 15, Type 30 851

Special speaker box, 5in bass and mid-range system. 12,000 gauss; and 4in tweeter system, 9,000 gauss. HC: 15W approx, music power. FR: 45Hz-18kHz. vci: 4-5 ohms. Natural walnut colour, satin finish. Dimensions:  $7 \times 11\frac{1}{2} \times 9\frac{1}{2}$ in. Supplied with 16ft patch cord with flat-pin plug. Price: approximately £17 (inc. PT).

#### LSB25, Type 29 860

Infinite baffle with bass and treble units. Speakers: 8in bass unit,  $5 \times 3$ in tweeter. FR: 40Hz-16kHz. HC: 15W music power. vci: 4-5 ohms. Size:  $22 \times 12 \times 5$ in. Finish: satin finish natural walnut. Supplied with 10ft lead and plug. Price: approximately £28 (inc. PT).

#### LSB 45, Type 30 865

Infinite baffle with bass and treble units. Speakers:  $9\frac{1}{2}$ in bass unit,  $7 \times 5$ in mid- and upper-frequency unit. FR: 30Hz-20kHz. HC: 25W music power. vci: 4-5 ohms. Size:  $25 \times 13 \times 7$ in. Finish: satin finish natural walnut. Supplied with 10ft lead and plug. Price: approximately £40 (inc. PT).

### ■ JAMES B. LANSING

Distributors: Feldon Audio Ltd,  
126 Great Portland Street, London, W1.  
Tel: 01-580 4314.

★ Indicates entry is illustrated

### JBL Aquarius 4 ★

Dual radial horn enclosure with units and crossover. One 8in bass driver, one 2in tweeter. Crossover: 3kHz. FR: 40Hz-20kHz (40Hz-16kHz  $\pm$  5dB). HC: 25W RMS. Impedance: 8 ohms. Omni-directional system with phase correction devices. Size: 40in high, 10  $\times$  10in square. Weight: 47lb. Finish: walnut or white. Price: £88.

### JBL Nova L88 ★

Reflex enclosure with units and crossover. One 12in bass unit with 3in-diameter voice coil, one 2in tweeter. Crossover: 1.2kHz (12dB/octave constant impedance). FR: 20Hz-20kHz (30Hz-18kHz  $\pm$  4dB). HC: 40W RMS. Impedance: 8 ohms. Bookshelf or free-standing design. Size: 24  $\times$  14  $\times$  12in. Weight: 48lb. Finish: walnut with geometric fabric grille. Price: £96.

### JBL Century L100 ★

Reflex enclosure with units and crossover. One 12in bass driver, one 4in mid-range unit, one 2in tweeter. Crossover: 2.5kHz, 7.5kHz (12dB/octave constant impedance). FR: 20Hz-20kHz (40Hz-15kHz  $\pm$  3dB). HC: 50W RMS. Impedance: 8 ohms. Domestic version of JBL control monitor. Size: 24  $\times$  14  $\times$  13in. Weight: 51lb. Finish: walnut with sculptured grille in blue, orange or brown. Price: £140.

### JBL Olympus ★

Reflex enclosure with drive units, passive radiator and crossover. One 15in bass driver, one 15in passive radiator, one 1in horn-loaded aluminium mid- and high-frequency unit with acoustic lens. Crossover: 800Hz (variable crossover, 12dB/octave constant impedance). FR: 20Hz-18kHz  $\pm$  3dB. HC: 75W RMS. Impedance: 8 ohms. Domestic version of JBL studio monitor. Rated 22% efficient in 10 cu ft enclosure. Size: 40  $\times$  27  $\times$  20in. Weight: 140lb. Finish: walnut with hand-carved walnut grille. Price: £380.

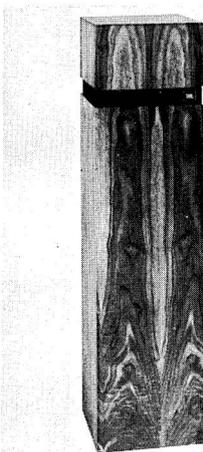
### JBL Lancer 101

Reflex enclosure with units and crossover. One 15in bass driver, one 1in horn loaded mid-high-frequency unit with 90% dispersion acoustic lens. Crossover: 2.5kHz (12dB/octave constant impedance). FR: 20Hz-20kHz (30Hz-20kHz  $\pm$  4dB). HC: 50W RMS. Impedance: 8 ohms. High efficiency system with high transient response HF unit. Size: 25  $\times$  18  $\times$  13in. Weight: 60lb. Finish: walnut sides, hand-carved front grille in walnut, marble top. Price: £208.

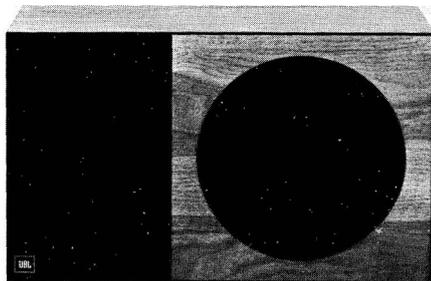
### ■ LEAK

Rank Wharfedale Ltd, Bradford Road, Idle, Bradford, Yorks.

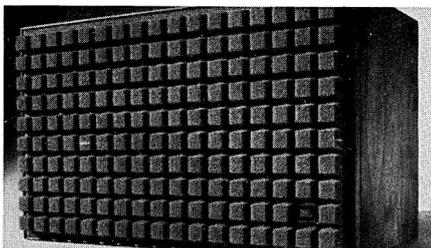
Tel: Bradford 612552. Telex: 51407.



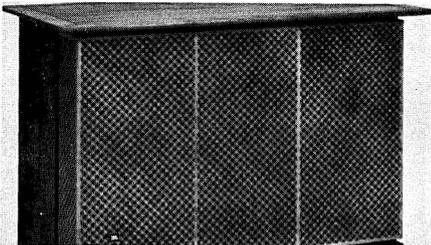
JBL Aquarius 4



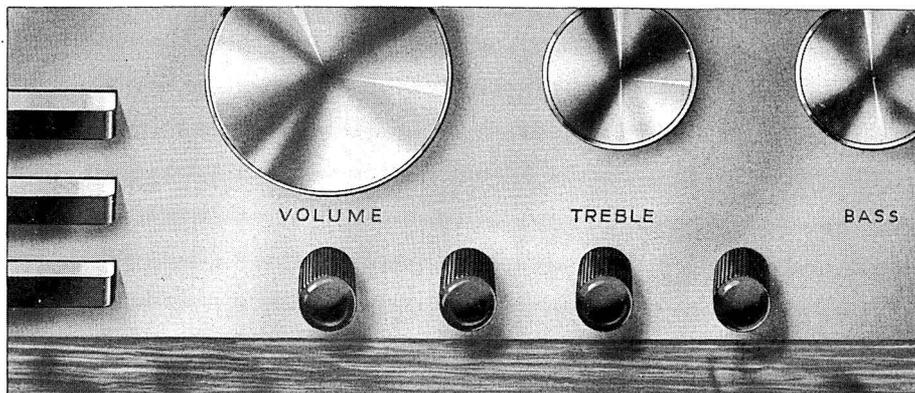
JBL Nova L88



JBL Century L100



JBL Olympus



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isation of what you have already, or a complete new installation. When you become a customer of E.M.G., you will find that service can go on long past the time of your purchase and that the Company identifies itself with your interests completely. There is no better way to ensure good listening. For a start, might we suggest, without obligation, a demonstration in our showroom? You will find our approach to high fidelity very much what you have always wanted.

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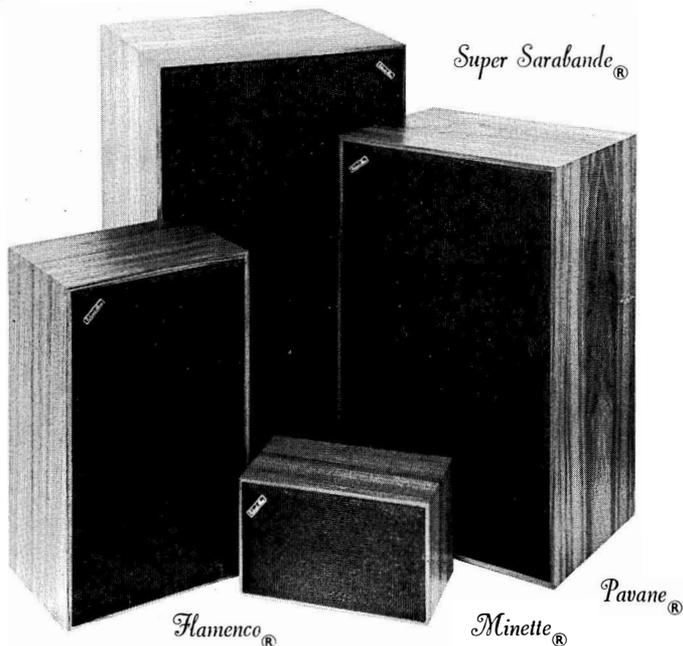
Telephone 01-734 4311

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# Richard Allan

## HIGH FIDELITY ENCLOSURES

for CONCERT HALL PERFORMANCE



- The enclosures designed with the requirements of the High Fidelity enthusiast in mind.
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**Richard Allan**

**Richard Allan Radio Limited**, Bradford Road, Gomersal,  
Cleckheaton, Yorkshire, England.  
Telephone Cleckheaton 2442/3



**Sandwich 200 ★**

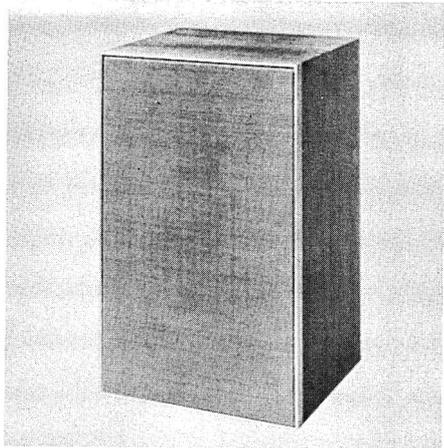
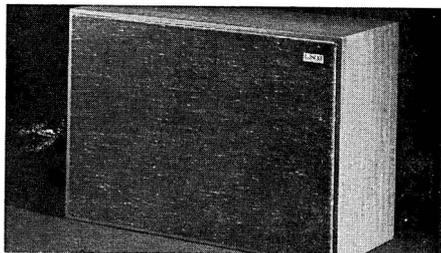
Infinite baffle enclosure with units and cross-overs. 6½in sandwich bass driver, 2½in mid-range unit, 2½in multi-directional tweeter. All units forward-facing. Three-way seven-element crossover at 1.5kHz and 5kHz. FR: 60Hz-18kHz. HC: 18W RMS. Impedance: 8 ohms (nominal). Size: 15½ × 10 × 8½in. Finish: teak or walnut with stainless steel woven mesh grille cloth. Fitted with DIN speaker plugs and 5 metres cable in recessed back. Price: (sold in matched pairs only) £49.90 per pair.

**Sandwich 300**

Infinite baffle enclosure with units and cross-overs. 8in sandwich bass driver, 2½in mid-range unit, 2½in multi-directional tweeter. All units forward-facing. Three-way six-element crossover at 1.5kHz and 5kHz. FR: 50Hz-18kHz. HC: 18W RMS. Impedance: 8 ohms (nominal). Size: 19½ × 11 × 10in. Finish: teak or walnut with stainless steel woven mesh grille cloth. Fitted with DIN speaker plugs and 5 metres cable in recessed back. Price: (sold in matched pairs only) £65 per pair.

**Sandwich 600**

Infinite baffle enclosure with units and cross-overs. 12in sandwich bass driver, 4in sandwich mid-range unit, 1in multi-directional tweeter. All units forward-facing. Three-way 10-element crossover at 1kHz and 4kHz. FR: 40Hz-20kHz. HC: 40W RMS. Impedance: 8 ohms (nominal). Size: 26 × 15 × 11½in. Finish: teak or walnut with woven mesh grille cloth. Price: £49.50 each.

*Leak Sandwich 200**LNB Audio Para-Lab 6***■ LEWIS AUDIO**

Louis and Lewis (Electronics) Ltd,  
154-155 High Street, Brentford, Middlesex.  
Tel: 01-560 1161.

**LS16**

Enclosure with units. One 13 × 8in bass driver, two tweeters. Impedance: 8 ohms. Finish: walnut. Size: 16½ × 10½ × 6½in. Price: £11.70.

**LS17/LS17T**

Enclosure with units. One 6in bass driver, one mid-range unit, one tweeter. Impedance: 8 or 15 ohms. Size: 16 × 8 × 6½in. Price: (LS17 in walnut) £10.80; (LS17T in teak) £10.80.

**LS18/LS18T**

Enclosure with units. One 8in bass driver, one mid-range unit, one tweeter. Impedance: 8 or 15 ohms. Size: 17½ × 10 × 7in. Price: (LS18 in walnut) £12.60; (LS18T in teak) £12.60.

**■ L.N.B. AUDIO LTD**

25 Cambridge Street, Loughborough, Leics.  
Tel: Loughborough 61229.

**Para-Tran 6 ★**

Infinite baffle two-way system. 6½in long-throw

bass driver with membrane compensator, 3½in tweeter. Damping material: long fibre wool. FR: 50Hz-17kHz. Impedance: 8 ohms at 400Hz. HC: 10W RMS, 20W peak. Size: 15½ × 11 × 8in. Weight: 15lb. Finish: oiled teak with complementary baffle. Price: £17.

**Para-Lab 6**

Labyrinth three-way system. Goodmans long-throw 6½in unit in labyrinth, two 3½in tweeters. Three-way crossover. System resonance 45Hz. FR: 40Hz-17kHz. Impedance: 8 ohms at 400Hz. HC: 12½W RMS, 25W peak. Size: 23½ × 10½ × 9in. Weight: 23lb. Finish: oiled teak with complementary baffle. Price: £24.

**Para-Lab-Super**

Similar construction to Para-Lab 6 but employing higher flux bass unit and studio quality tweeters. Goodmans long-throw 6½in unit in labyrinth, plus KEF T27 tweeter and STC ultra HF unit. Three-way crossover. FR: 40Hz-25kHz. Impedance: 8 ohms at 400Hz. HC: 12½W RMS, 25W peak. Size: 23½ × 10½ × 9in. Weight: 26lb. Finish: oiled Burma teak with complementary baffle. Price: £32.

★ Indicates entry is illustrated

■ **LOCKWOOD & CO (Woodworkers) LTD**

63 Lowlands Road, Harrow, Middx.

Tel: 01-422 3704/0768.

**Mini-slim**

Reflex, forward facing, 12in units. Rec. Tannoy 12in dual concentric, Tannoy III LZ dual concentric. Size:  $27\frac{1}{2} \times 19 \times 9\frac{1}{8}$ in. Price (with specified units): from approximately £45.

**Minor Slim**

Reflex, forward facing, 12 or 15in units. Rec. Tannoy 12 or 15in dual concentric, and units listed for Mini-slim. Size:  $33\frac{1}{2} \times 20 \times 11\frac{1}{4}$ in. Price (with specified units): from approximately £50.

**Major Slim**

Reflex, forward facing, 12 or 15in units. Rec. Tannoy 12in and 15in dual concentric. Size:  $38 \times 24 \times 11\frac{1}{4}$ in. Price: from approximately £64.

■ **LOWTHER MANUFACTURING CO**

Lowther House, St Mark's Road, Bromley, Kent, BR29HQ.

Tel: 01-460 5225. Cables: Lowther, Bromley.

**Corner Reproducer TP1**

Folded bass horn/direct HF horn type. One specially designed 6in pressure unit PM3. Acoustical crossover. FR: 40Hz-22kHz. Size:  $47 \times 32 \times 31$ in from corner. Weight: 70lb. Price: (Standard Model) £165; (Model B) £180; (Model D) £145.

**Acousta Cabinet**

Model FH/V. Folded horn type, forward facing, with rear folded horn. Vertical on runners. Designed for use with single 6in or 8in unit. Rec. Lowther PM6. FR: 40Hz-18kHz. Size:  $32 \times 18\frac{1}{4} \times 14\frac{1}{2}$ in. Weight: 60lb. Price (without unit) £30 (plus PT).

**Mini Acousta**

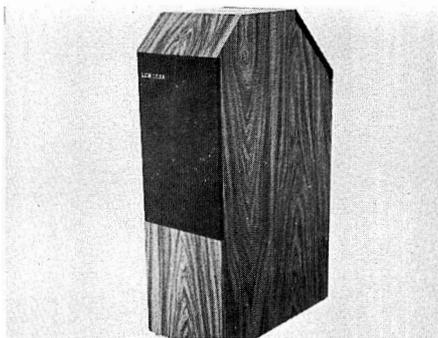
Model FH/V (vertical). Folded horn type. Forward facing with rear folded horn. Veneered all round. Designed for use with one 6-8in unit. Rec. Lowther PM6 or PM7. FR: 40Hz-20kHz. Size:  $27 \times 15 \times 13$ in. Price (without unit) £30 (plus PT).

**Audiovector**

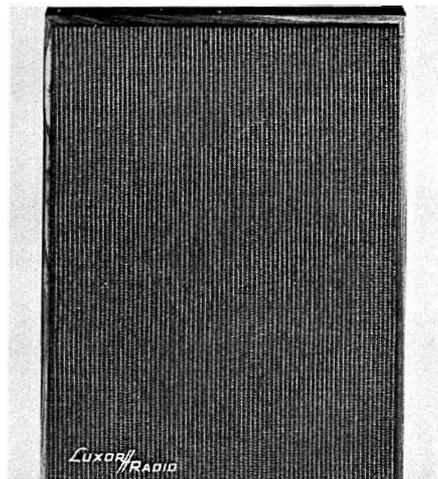
Compound horn. Upward facing mid- and high-frequency horn with rear folded horn. Designed for use with single 6in unit. Acoustic crossover. FR: 40Hz-22kHz. Rec. PM2, PM2 Mk II or PM4. Size:  $26\frac{1}{2} \times 19 \times 34$ in. Weight: 75lb. Price: (Model A without unit) £75; (Model B without unit) £70.

**Dual Position Acousta**

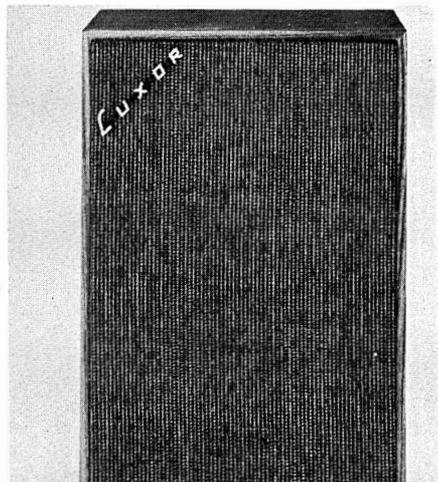
Folded horn. Rearward facing into corner or along wall at 45 degrees. Bass outlets coupling into corner of room or along wall. Designed for use with single 6in high flux unit. Rec. Lowther



Lowther Auditorium-Acousta



Luxor KH820



Luxor KH520

PM6 or PM7. FR: 40Hz-18kHz. Size: 32 × 9½ × 18in. Price (without unit) £30 (plus PT).

#### L.I.B. Acosta

Lowther Ideal Baffle is a special enclosure in the Lowther range of folded rear and compound horn designs. It has closed back with anti-phase slave membrane to overcome resonance. Membrane is coupled to drive unit by compliance and matched via a short labyrinth. Effect is that drive unit frequency response, say 30Hz-20kHz, such as PM6, becomes 25Hz-20kHz. Veneered teak, walnut or sapele finish. Grille cloth: grey. Dimensions: 19 × 14 × 7½in. Price: (without unit) £15 (plus PT).

#### Auditorium Acosta ★

Twin channel enclosure. Based on design of Dual Position Acosta with forward-facing drive unit. Variable preset level control. Rear unit only using folded horn. Designed for use with two 6-8in units (Lowther PM6, PM6 Mk I and/or PM7). Size: 32 × 9½ × 19in. Weight: (less units) 39½lb. Price: (without units) £40 (plus PT).

#### Auditorium Audiovector

Twin channel enclosure. Improved version of Audiovector with forward-facing drive unit (PM2 Mk 1). Variable preset level control. Size: 34 × 25½ × 19in. Weight: 108lb. Price: (Model A) £185; (Model B) £175.

### ■ LUXOR

Distributors: Luxitone Ltd,  
84 Bolsover Street, London, W1.  
Tel: 01-636 2901.

#### KH820 ★

Incorporates one 8in bass unit, two 2in tweeters. FR: 40Hz-18kHz. HC: 20W. vci: 4 ohms. Dimensions: 10 × 16 × 8½in. Weight: 14lb. Finish: teak and rosewood. Price: £18.

#### KH520 ★

Incorporates one 5in bass unit and one 2½in tweeter. FR: 45Hz-18kHz. HC: 15W. vci: 4 ohms. Dimensions: 10 × 7½ × 8½in. Weight: 7lb. Finish: teak and rosewood. Price: £16-50.

#### KH500

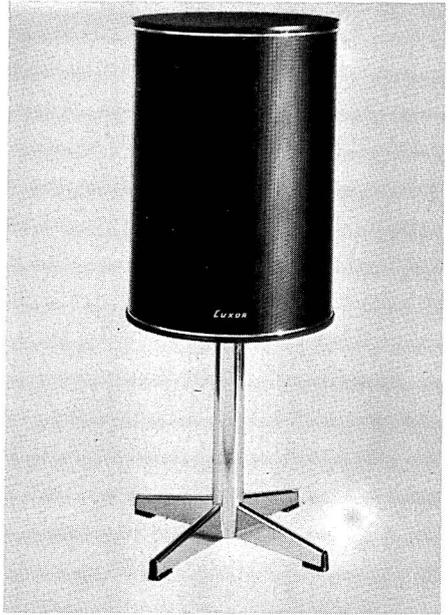
Infinite baffle enclosure with unit. One special 4in driver. FR: 50Hz-16kHz. HC: 10W RMS. Impedance: 4 ohms. Size: 7¾ × 4¾ × 5¾in. Finish: teak or rosewood. Price: £11-50.

#### SH104

Infinite baffle enclosure with units. One 10in bass driver, two 2in tweeters. FR: 20Hz-20kHz. HC: 40W RMS. Impedance: 4 ohms. Size: 12½ × 10 × 22in. Finish: teak or rosewood. Price: £32.

#### SH835 ★

Cylindrical type omni-directional speaker enclosure with units. On stand with cruciform base.



Luxor SH835

Four 5in bass drivers, four 2½in tweeters. Crossover: 1.5kHz. FR: 35Hz-20kHz. HC: 40W RMS. Impedance: 4 ohms. Finish: teak with black grille and chrome stand. Price: £55.

### ■ METRO SOUND

Metrosound Manufacturing Co Ltd,  
Audio Works, Cartersfield Road,  
Waltham Abbey, Essex.  
Tel: Waltham Cross 31933.

#### Metrosound HFS103

Infinite baffle enclosure with units and crossover. One 10¾ × 6½in bass driver, two 2½in tweeters. Crossover: 5kHz. FR: 50Hz-15kHz. HC: 10W RMS. Impedance: 8 ohms. Size: 14 × 9 × 7in. Weight: 9lb. Finish: teak veneer cabinet and slatted grille, silver trim. Price: £25 a pair.

#### Metrosound HFS202

Infinite baffle enclosure with units and crossover. One 13½ × 8½in bass driver, one 3½in tweeter. Crossover: 5kHz. FR: 40Hz-18kHz. HC: 20W RMS. Impedance: 8 ohms. Size: 23 × 11½ × 11in. Weight: 22¾lb. Finish: teak veneer cabinet (¾in thick) with slatted grille and silver trim. Price: £21-50 each.

### ■ EDWARD MICHELSEN CUSTOM CABINETS

153 Plumstead Road, London, SE18.  
Tel: 01-854 2369.

★ Indicates entry is illustrated

### **Paraline**

Unique design by Rex Baldock. Size: 41 × 16 × 7in. Made in left-hand or right-hand versions. Recommended drive units: Elac 8N/185 or Lowther PM6. Price: in white wood £8; finished in teak or mahogany £18-50.

### **Paramid**

Designed by Edward Michelsen as a vertical version of the Paraline, Performance, units and prices as for the Paraline.

### **Paraline Tweeter Kit**

Comprising special Elac tweeter with 2μF capacitor. Price: £1-75 complete with instructions.

### **A.C.E.**

Acoustic coupled enclosure, a new concept in column loading. Size: 36in high, 16in wide, 9½in deep. FR: (with Elac 8N/185) 40Hz-12kHz; (with Lowther PM6) 40Hz-17kHz. HC: 6W with high electro-acoustic efficiency. Layered damping. Full specification on request. Price: in white wood £10-50; finished in teak or mahogany £14; diffuser unit for PM6 £3-75.

### **Bookshelf Horn**

Small enclosure designed to give performance near to that of the Paraline. Complete with Elac 8N/185. Price: in white wood £13-50; ready finished £17-75.

### **Bassette**

A bass reproducer designed by Trevor Atwell. Performance goes down below 30Hz. Window seat type styling. Dimensions: 5ft 6in × 17in × 15in. Drive units: 4 × Elac 8N/185. Price complete in teak, mahogany or pine veneer: £46-43.

### **Three-speaker infinite baffle**

Incorporating KEF B139, B110, T27 and DN12 crossover. As described in *Hi-Fi Sound* (Sept. 1969). Price: (in whitewood with units) £38; (finished in teak, mahogany or pine with units) £43.

Comprehensive range of speaker enclosure kits from simple infinite baffle types to elaborate horn systems. Also from small restricted-range models to large bass-only versions. Cabinets built to special order from customer's own drawings. Full details and prices on request.

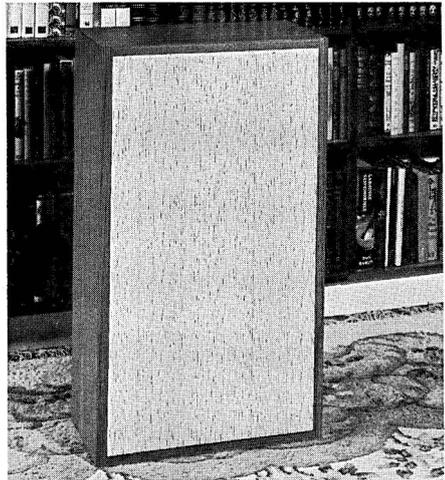
Kit prices are from £6-90 to £12-60 and include pre-cut timber, veneer, damping material (where required), screws, pins, glue, grille material, speaker terminals and instructions.

## **■ MMG ASSOCIATES**

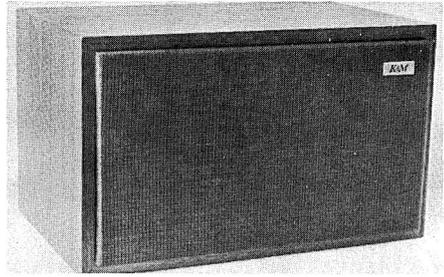
8 Watford Heath Farm, Oxhey, Watford, Herts. WD14ER. Tel: Watford 21754.

### **Emperor 101 ★**

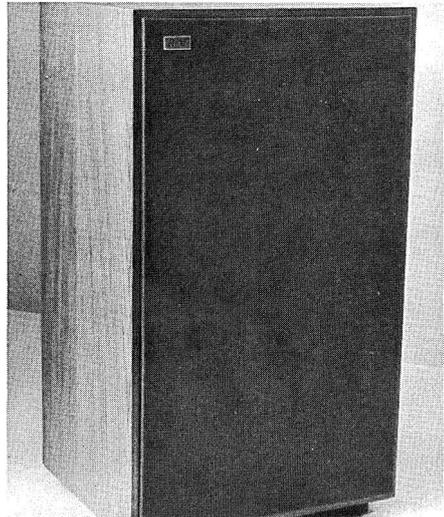
Infinite baffle type enclosure. 13 × 8in elliptical driver with coaxially mounted high frequency unit. Crossover: 5kHzchoke-capacitor network.



**MMG Emperor 101, 102**



**Keith Monks Elf**



**Keith Monks KM70**

FR: 50Hz-16kHz. HC: 20W. vci: 8 ohms. Adjustable high frequency balance. Finish: teak effect in Melamine plastic, with other finishes to order. Size: 31 × 17 × 9in. Weight: 39½lb. Price: £33.

**Emperor 102 ★**

As Emperor 101 but vci is 16 ohms. Price: £33.

**Emperor Mk III**

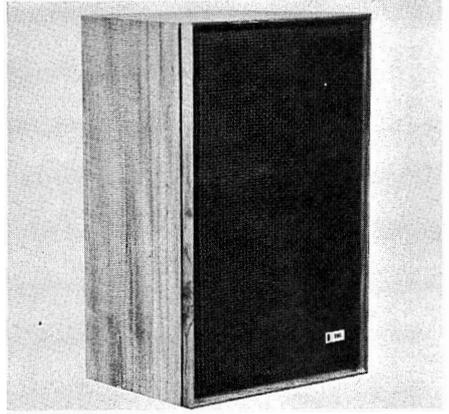
Full specification and prices of the Emperor Mk III Series available on request.

**Emperor Studio Monitor**

Full specification and prices of the Emperor Studio Monitor systems available on request.

**Emperor Custom Series**

Speaker systems manufactured to customer's own design and specifications. Full details of service on request.



*Kmal Super Elf*

■ **KEITH MONKS (Audio) LTD**

5 Fleet Road, Fleet, near Aldershot, Hants.

Tel: Fleet 7316.

**Elf ★**

Bookshelf reflex enclosure with three units. Built-in filter system. 6½in bass driver, two 3in tweeters. HC: 12W RMS. FR: 40Hz-16kHz. Finish: teak (formica to order). Price: £21 (no PT).

**D15/40 Minor**

No-compromise bookshelf speaker system. Incorporates one TCL module. Cabinet designed as low friction phase inverter to provide optimum load to driver. HC: 15W RMS over specified range (30W music rating). Finish: teak. Size: 17½ × 11 × 8½in. FR: 40Hz-22kHz. Weight: 20lb. Price: £30.

**D30/30 Major**

Free-standing home speaker system. Designed for larger rooms. Electrical delay circuit to shape sound distribution. HC: 30W RMS over specified range (60W music rating). FR: 30 Hz-22kHz. Finish: teak. Size: 33 × 19½ × 9½in. Weight: 51lb. Price: £70.

**KM70 ★**

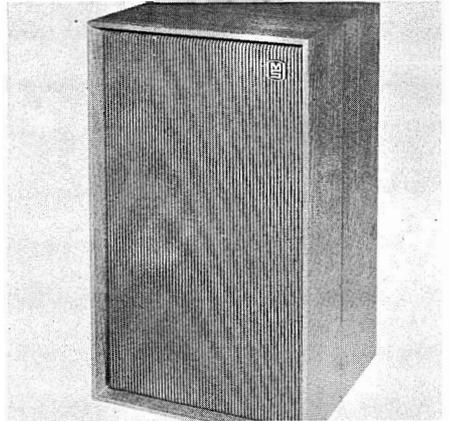
Floor-standing acoustic labyrinth system. KEF bass driver, tweeter and modified TCL unit. HC: 30W RMS (requires at least 15W RMS to drive system efficiently). FR: 25Hz-22kHz. Finish: teak. Price: £86.

**KM70/F**

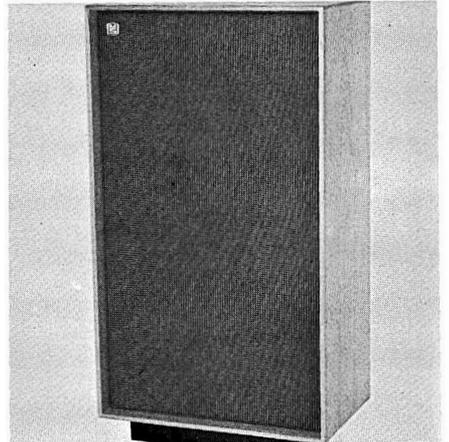
Similar specification to KM70 but with special finish in formica. Also available to special order in white, teak or rosewood finish. Price: £92.

**KMAL Super Elf ★**

Bookshelf enclosure with units and crossover. One 8in long-throw bass driver, two 4in-high response tweeters. FR: 40Hz-18kHz. Impe-



*Mordaunt-Short MS077*



*Mordaunt-Short MS400*

★ Indicates entry is illustrated

dance: 8 ohms. HC: 15W RMS. Size:  $17\frac{1}{2} \times 11 \times 8\frac{1}{2}$ in. Finish: hard waxed teak veneer with Vynair grille. Price: £29-50.

### ■ MORDAUNT-SHORT LTD

The Courtyard, Heath Road, Petersfield, Hampshire. Tel: Petersfield 4761/2.

#### MS 077 ★

Infinite baffle compact bookshelf enclosure with three units.  $6\frac{1}{2}$ in bass driver, 3in mid-range unit, 2in tweeter. Crossover: 1kHz and 5kHz. FR: 40Hz-20kHz. HC: 15W music rating. Impedance: 8 ohms. Size:  $15\frac{3}{4} \times 9\frac{1}{2} \times 8$ in. Weight:  $14\frac{1}{2}$ lb. Finish: teak or walnut veneer, including rear of cabinet. Other finishes to special order. Price: £29.

#### MS 400 ★

Infinite baffle enclosure with one 12in bass driver, one 3in melinex diaphragm mid-range unit and one STC high frequency tweeter. Crossover: 2-25kHz and 1kHz. Printed circuit network. FR: 35Hz-25kHz. HC: 25W. vci: 8 ohms. Dimensions:  $27 \times 15 \times 9$ in, on  $1\frac{3}{4}$ in plinth. Weight: 43lb approx. Finish: teak or walnut veneer (including rear of cabinet). Other finishes to special order. Price: £56.

#### MS 700

Infinite baffle enclosure with 12in bass driver, 5in mid-range unit and Decca-Kelly 30W ribbon tweeter. Crossover: 750Hz and 4-5kHz. Multi-stage crossover network. FR: 25Hz-25kHz. HC: 30W. vci: 8 ohms. Dimensions:  $33 \times 17 \times 12$ in on  $1\frac{3}{4}$ in plinth. Weight: 52lb approx. Finish: teak or walnut veneer, including rear of cabinet. Other finishes to special order. Price: £78.

■ NICHOLS ACOUSTIC See Derwent.

### ■ NIVICO

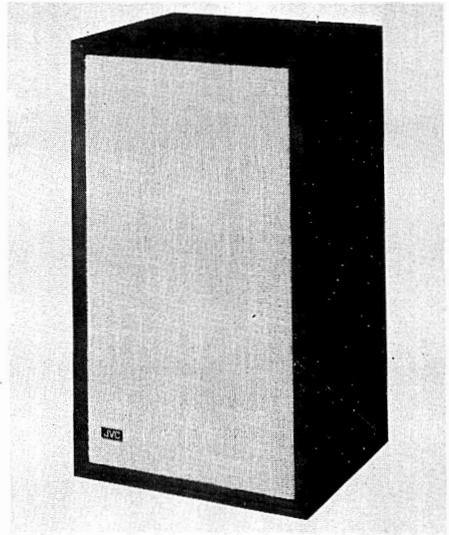
Denham & Morley Ltd, Denmore House, 453 Caledonian Road, London, N7. Tel: 01-607 6568.

#### GB-1E

Omni-directional speaker system suitable for suspension from a ceiling or fitted to a floor stand. Infinite baffle enclosure. Four 5in free-edge bass drivers, four horn tweeters. Crossover: 5kHz. FR: 20Hz-20kHz. HC: 40W RMS. Impedance: 8 ohms. Dimensions:  $13\frac{1}{2}$ in diameter approximately. Weight:  $26\frac{1}{2}$ lb. Finish: perforated black metal case. Price: £84.

#### GB-2E

Omni-directional speaker system suitable for suspension from a ceiling or fitted to a floor stand. Six 3in long-throw drivers. HC: 15W RMS. FR: 120Hz-20kHz. Impedance: 8 ohms.



Nivico 5390U

Dimensions:  $11\frac{1}{2}$ in diameter approximately. Weight:  $8\frac{3}{4}$ lb. Finish: wood appearance plastic material. Price: £39-95.

#### 5390U ★

Speaker enclosure with units. One  $6\frac{1}{2}$ in free rolled-edge bass driver, one 2in cone tweeter. FR: 40Hz-20kHz. Impedance: 8 ohms. HC: 15W RMS. Size:  $16 \times 9\frac{1}{4} \times 7\frac{1}{2}$ in. Weight:  $7\frac{3}{4}$ lb. Sold in matched pairs. Price: (per pair) £42-67.

### ■ NORDMENDE

Distributors: TAK Continental Importers, 16a High Street, Stone, Staffordshire. Tel: Stone 3232, 3233.

#### LB31

Bookshelf type in natural walnut or white. HC: 15W RMS. FR: 45Hz-20kHz. vci: 5 ohms. Dimensions:  $6\frac{1}{4} \times 7 \times 10\frac{1}{2}$ in approx. Price: £18-90 (including PT).

#### LB32

White/eggshell paint with offset front panel in red or walnut or Rio rosewood with offset front panel in radiant black. HC: 7W RMS. FR: 70Hz-18kHz. vci:  $4\frac{1}{2}$  ohms. Dimensions:  $9 \times 8 \times 5\frac{1}{2}$ in approx. Price: £18-90 (including PT).

#### LB33

Natural walnut, teak, Rio rosewood or elm. HC: 10W RMS. FR: 48Hz-20kHz. vci: 5 ohms. Dimensions:  $7 \times 8 \times 10\frac{1}{2}$ in approx. Price: £18-90 (including PT).

#### LB41

Walnut with white front or matt black. HC: 7W RMS. FR: 70Hz-18kHz. vci:  $4\frac{1}{2}$  ohms. Dimen-

sions: 7×7×8in approx. Price: £18-90 (including PT).

### LB60

Finished in red, white, radiant black, green, walnut, teak or Rio rosewood and available with elegant chromium-plated stand for tilting. HC: 20W RMS. FR: 35Hz-20kHz. vci: 8 ohms. Dimensions: 30×15×7in approx. Price: £40-95 plus £3-15 for stand (including PT).

### ■ PEAK SOUND

Peak Sound (Harrow) Ltd, 32 St Judes Road, Englefield Green, Egham, Surrey.  
Tel: Egham 5316.

#### Speaker system

Baxandall speaker. Price: £19-28 (including PT). ES 10-15 speaker unit. Price: £2-91 (inc. PT). ES 10-15 equalisers, chokes and components. Price: £2. ES 10-15 pack-flat cabinet. Price: £9. Further details on request.

### ■ PHILCO-FORD

Philco-International Ltd, 42 Leicester Square, London, WC27LR. Tel: 01-930 7667.

#### 1600

Infinite baffle enclosure with units and crossover. One 13½×8¼in bass and mid-range driver, one 2½in tweeter. Crossover: 8-5kHz. FR: 55Hz-13kHz. HC: 12W RMS. Impedance: (at 1kHz) 8 ohms. Finish: white satin with black grille cloth and brushed aluminium trim. Size: 16×10×8in. 10ft connecting lead with DIN plug. Price: £16.

### ■ PHILIPS ELECTRICAL LTD

Century House, Shaftesbury Avenue, London, WC2.

Tel: 01-437 7777. Cables: Phillamps, London.

#### RH402

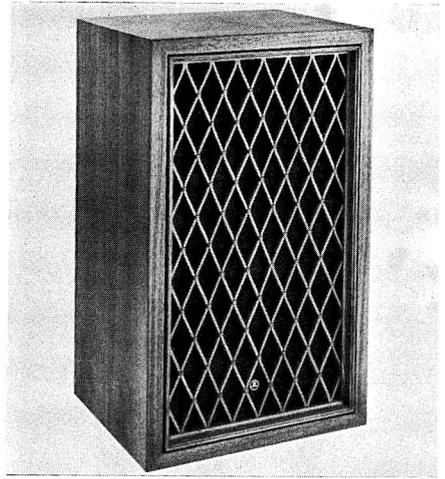
Infinite baffle enclosure with units and crossover. One 7in bass driver, one 1in tweeter. Crossover: 1-2kHz. FR: 50Hz-20kHz. HC: 20W RMS. Resonant frequency: 90Hz. Impedance: 8 ohms. Finish: teak veneer. Size: 10½×10½×4in. Price to be announced.

#### RH406

Infinite baffle enclosure with units and crossovers. One 8in bass driver, one 5in mid-range unit and one 1in tweeter. Crossover: 700Hz and 3kHz. FR: 35Hz-20kHz. HC: 25W RMS. Impedance: 8 ohms. Finish: teak veneer. Size: 13½×18½×8⅞in. Price: £34 (no PT).

#### RH407

Infinite baffle enclosure with units and crossovers. One 10in bass driver, one 5in mid-range unit and one 1in tweeter. Crossover: 700Hz and 3kHz. FR: 40Hz-20kHz. HC: 40W RMS.



Pioneer CS66

Impedance: 8 ohms. Contour switch to adjust top response. Finish: teak veneer. Size: 21¼×16¼×8⅞in. Price: £42 (no PT).

#### RH411

Enclosure with drive unit. One dual-cone 5in driver. HC: 10W. FR: 60Hz-16kHz. Impedance: 8 ohms. Finish: teak veneer. Size: 10½×7¼×7¼in. Price: to be announced.

#### RH412

Enclosure with drive unit. One 7in dual-cone driver. HC: 10W. FR: 50Hz-16kHz. Impedance: 8 ohms. Finish: teak veneer. Size: 13½×10×7¼in. Price: to be announced.

### ■ PIONEER

Distributors: Shriro (UK) Ltd, 42 Russell Square, London, WC1B 5DF.  
Tel: 01-580 6996.

#### CS53

Reflex enclosure with two units. One 12in bass driver, one 3½in tweeter. FR: 45Hz-20kHz. HC: 40W. Impedance: 8 ohms. Size: 22½×16½×11⅞in. Weight: 28lb. Finish: walnut. Price: £41-13.

#### CS63DX

Infinite baffle enclosure with six units. One 15in bass driver, two 5in mid-range units, one horn tweeter, two horn super tweeters. Crossover: 770Hz, 3-3kHz, 12kHz. FR: 20Hz-22kHz. HC: 80W RMS. Impedance: 8 ohms. Size: 28⅞×18⅞×13⅞in. Finish: walnut. Price: £120-14.

#### CS66 ★

Infinite baffle enclosure with three units. One 10in bass driver, one 6½in mid-range unit, one 3½in cone tweeter. Crossover: 1-85kHz, 6-85

★ Indicates entry is illustrated

kHz. FR: 35Hz-20kHz. HC: 40W RMS. Impedance: 8 ohms. Size:  $12\frac{1}{4} \times 22 \times 11\frac{1}{2}$ in. Weight: 29lb. Finish: walnut. Price: £53.17.

#### CSE500

Infinite baffle enclosure with three units. One 10in bass driver, one 5in mid-range unit, one 3in cone tweeter. Crossover: 650Hz-5kHz. FR: 37Hz-20kHz. HC: 50W RMS. Impedance: 8 ohms. Size:  $13 \times 22\frac{1}{2} \times 11\frac{1}{8}$ in. Designed for two-channel or three-channel stereo systems. Finish: walnut with fabric grille. Price: £56.76.

#### CSE700

Infinite baffle enclosure with three units. One 12in bass driver, one 5in mid-range unit, one multi-cellular horn tweeter. Crossover: 500Hz, 4-5kHz. FR: 35Hz-20kHz. HC: 60W RMS. Impedance: 8 ohms. Size:  $15 \times 26 \times 11\frac{7}{8}$ in. Weight: 35lb. Designed for use with two or three power amplifiers direct and with electronic crossover independent of crossover in cabinet. Finish: walnut with fabric grille. Price: £79.73.

#### ■ QUAD

Acoustical Manufacturing Co Ltd,  
St Peter's Road, Huntingdon, Hunts.  
Tel: Huntingdon 2561/2. Cables: Acoustical.

#### Quad Electrostatic ★

Full range doublet covering 45Hz-18kHz. Attenuation outside band asymptotic to 18dB/8ve. Total integrated radiation at max output equivalent to 95 phons in rooms of up to 5,000 cu ft with average reverberation. Dispersion approx 70 deg horizontal; 15 deg vertical. Imp 30-15 ohms, 40Hz to 8kHz, falling above 8kHz. Designed for use with standard Quad 303 Amplifier. Suitable for AC supplies 100-120 or 200-250V 50-60Hz. Free-standing unit requires no enclosure or cabinet. Weight: 35lb. Price: £66 complete.

#### ■ RADFORD

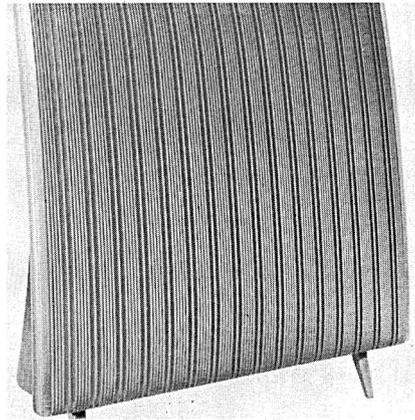
Radford Acoustics Ltd, Ashton Vale Road,  
Bristol, BS32HZ. Tel: Bristol 662301.

#### Bookshelf II

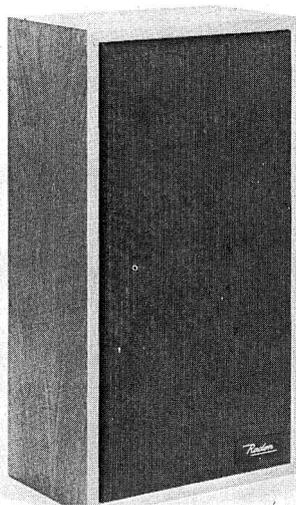
Cabinet with speakers and crossover. 12in bass driver,  $1\frac{3}{8}$ in tweeter. Infinite baffle. Crossover: 1.5kHz. FR: 55Hz-14kHz. HC: 30W RMS. Impedance: 8-16 ohms. Finish: afrormosia veneer. Size:  $21 \times 12 \times 9$ in. Weight: 30lb. Price: £32.50.

#### Monitor II

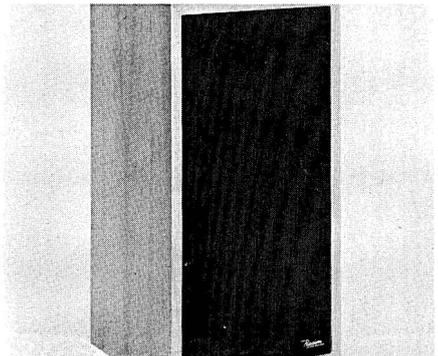
Cabinet with speakers and crossover. 12in bass driver, 3in mid-range unit,  $1\frac{3}{8}$ in tweeter,  $\frac{3}{4}$ in super HF. Bass unit in infinite baffle, mid-range acoustic line loading. Crossover: 500Hz, 4.2kHz, 10kHz. FR: 45Hz-25kHz. HC: 50W. Impedance: 8-16 ohms. Dimensions:  $30 \times 12 \times 10\frac{1}{2}$ in. Finish: afrormosia veneer. Weight: 43lb. Price: £60.



Quad Electrostatic



Radon Amethyst



Radon Opal

**Auditorium II**

Cabinet with speakers and crossover. 12in bass driver, 3in mid-range unit, 1 $\frac{3}{8}$ in tweeter,  $\frac{3}{4}$ in super HF. Bass unit infinite baffle. Crossover: 500 Hz, 42kHz. 10kHz. FR: 35Hz-25kHz. HC: 50W. Impedance: 8-16 ohms. Finish: afrormosia veneer. Size: 35 $\frac{1}{4}$  × 16 × 13in. Weight 70lb. Price: £80.

**Studio 12**

Cabinet with speakers and crossover. 12in bass driver, 3in mid-range unit, 1 $\frac{3}{8}$ in tweeter and  $\frac{3}{4}$ in super HF. Crossover: 500Hz, 4.2kHz, 10kHz. FR: 45Hz-25kHz. Transmission line loading on bass driver. HC: 50W. Impedance: 8-16 ohms. Finish: afrormosia veneer. Size: 45 $\frac{1}{4}$  × 17 × 15in. Weight: 98lb. Price: £100.

**Tri-Star 50**

Cabinet with speakers and crossover. One 12in bass driver, one 3in mid-range unit, one 1 $\frac{3}{8}$ in tweeter. Bass unit in infinite baffle enclosure. Crossover: 500Hz, 4.2kHz. FR: 55Hz-25kHz. HC: 50W RMS. Impedance 8-16 ohms. Finish: afrormosia veneer. Size: 21 × 12 × 9. Weight: 32lb. Price: £42.50.

**Studio 270**

Cabinet with speakers and crossover. Two 12in bass drivers, three 3in mid-range units, three 1 $\frac{3}{8}$ in tweeters. Crossover: 500Hz and 4.2kHz. FR: 30Hz-25kHz. HC: 100W RMS. Impedance: 8 ohms. Finish: afrormosia veneer or walnut. Size: 45 × 17 × 15in. Weight: 110lb. Price: £125.

## ■ RADON INDUSTRIAL ELECTRONICS CO LTD

Brooklands Trading Estate, Orme Road, Worthing, Sussex. Tel: Worthing 34904.

**Jewel Range**

Range of six speakers in hand-built teak enclosures. Finished in satin lacquers and charcoal-coloured fronts. Brass key plates for wall mounting. Impedances: 8 or 15 ohms.

**Amethyst SC/1 ★**

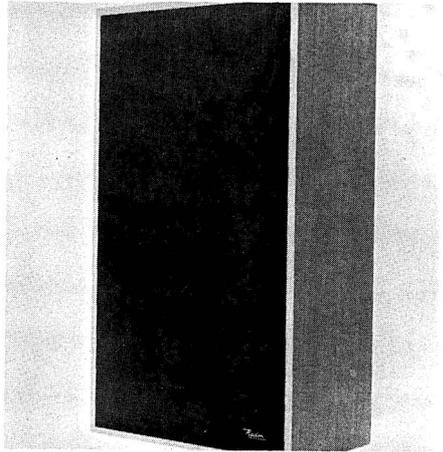
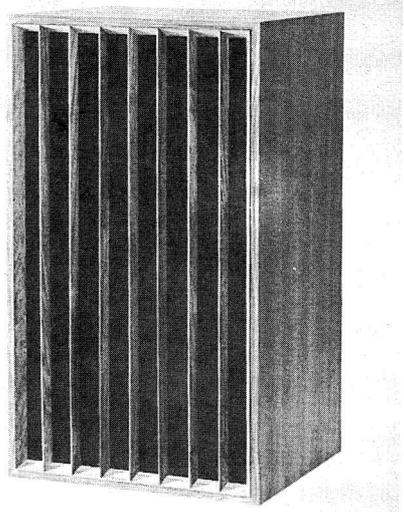
Infinite baffle. HC: 10W maximum. FR: 60Hz-17kHz ± 6dB. System comprises 6 $\frac{1}{2}$ in woofer with ceramic magnet of 10,000 gauss and 1in voice coil; and 4in tweeter with crossover. Size: 19 × 10 × 6in. Price: £13.90 (including PT).

**Emerald SC/2**

Infinite baffle. HC: 12W maximum. FR: 50Hz-10kHz ± 5dB. 10 × 6in woofer with aluminium centre cone and high compliance PVC suspension; tweeter and crossover. Price: £20.22 (including PT).

**Opal SC/3 ★**

Infinite baffle. HC: 15W maximum. FR: 20Hz-20kHz ± 8dB. Speakers: 13 × 8in woofer using ceramic magnet of 11,000 gauss, high compli-

*Radon Sapphire**Radon Topaz*

ance PVC surround, aluminium centre cone; tweeter with 10,000 gauss ceramic magnet, driven from crossover network at 5kHz. Dimensions: 23 × 12 × 11in. Price: £24.

**Sapphire SC/4 ★**

Enclosure with 12in woofer using ceramic magnet of 15,500 lines and 1 $\frac{3}{4}$ in speech coil. 4 × 4in tweeter assembly on heavy diecast alloy-frame for non-directional sound. HC: 25W maximum. FR: 20Hz-18kHz ± 2dB. Cabinet size: 30 × 16 × 9in. Price: £34.

**Topaz SC/5 ★**

Infinite baffle enclosure with units. 14 × 9in bass driver, 5in mid-range unit, 3 $\frac{3}{8}$ in tweeter. FR:

★ Indicates entry is illustrated

50Hz-20kHz. HC: 20W RMS. Impedance: 8 ohms. Size: 28 × 16 × 13in. Weight: 32lb. Finish: natural teak satin lacquer. Special cross-over provides control to mid-range and HF frequencies. Bass unit fitted with laminated glass fibre cone and diecast chassis. Price: £60.

#### Pearl SC/6

Labyrinth enclosure with units. 10in Goodmans Axiom bass driver, two 3 $\frac{3}{4}$ in tweeters. Cross-over: LC network. FR: 40Hz-18kHz. HC: 10W RMS. Impedance: 8 or 15 ohms. Size: 25 × 16 $\frac{1}{2}$  × 15 $\frac{1}{2}$ in. Weight: 28 $\frac{1}{2}$ lb. Finish: teak. Cabinet fitted with acoustic resistance and special baffle system for level response. Price: £40.

#### System 500

Infinite baffle enclosure with unit. 6 $\frac{1}{2}$ in long-throw bass driver with PVC surround. FR: 40Hz-18kHz. HC: 6W. Impedance: 8 or 15 ohms. Size: 8 × 11 × 6in. Weight: 6lb. Finish: teak. Price: £10.11 (including PT).

### ■ RECTAVOX COMPANY

Central Buildings, Wallsend, Northumberland.  
Tel: Wallsend 624845.

#### Omni Mk II

Reflex enclosure with special shape giving low resonant frequency and unique versatility of positioning. Units: K.E.F. B139 foil-stressed expanded polystyrene diaphragm bass and mid-range driver, K.E.F. T15 hemispherical dome tweeter. Crossover five-element  $\frac{1}{2}$ -section 1kHz. FR: 30Hz-20kHz ± 3dB. vci: 15 ohms. HC 15W. Finish: Teak, walnut or mahogany laminated plastic wood grain veneers. Tygan fret material, satin-chrome brass frame. Size: 24 $\frac{1}{2}$ in maximum dimension, fret front 18 $\frac{3}{4}$  × 11 $\frac{1}{2}$ in. Weight: 40lb. Price: to be announced.

Comprehensive information available on matching to transistor amplifiers.

### ■ ROGERS DEVELOPMENTS

#### (Electronics) LTD

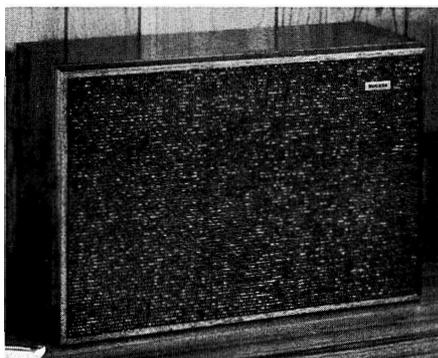
4/14 Barmeston Road, Catford, London, SE6.  
Tel: 01-698 7424/4340. Cables: Rodevco, London, SE6.

#### Wafer System

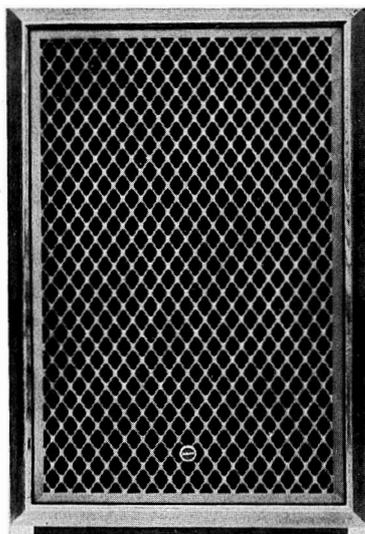
Infinite baffle enclosure with two units. One 5in bass driver plus tweeter. FR: 40Hz-16kHz. HC: 12W. Impedance: 15 ohms. Finish: solid afrosmosia frame with black fret material. Size: 13 $\frac{3}{8}$  × 16 $\frac{3}{8}$  × 2 $\frac{1}{2}$ in. Price: £16 (plus £4.01 PT).

#### Ravensbourne Compact

Infinite baffle enclosure with units. 8in high-flux bass driver, 3 $\frac{1}{2}$ in. HF 1300 tweeter. Crossover 2.5kHz. FR: 50Hz-14kHz. HC 10-15W RMS. Finish: teak veneer. Size: 22 × 11 $\frac{1}{2}$  × 8 $\frac{1}{2}$ in. Price: £32.



Rogers Ravensbrook 3



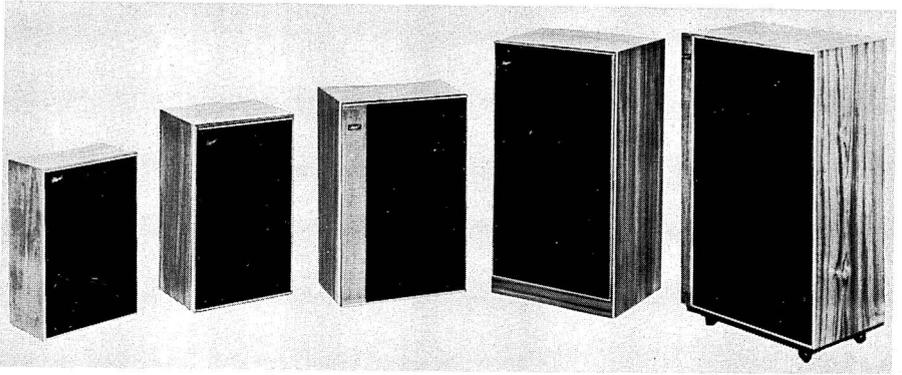
Sansui SP30: SP50: SP300

#### Ravensbrook 3-Speaker System ★

Infinite baffle enclosure with three units. One high-flux 8in bass driver, two 3in tweeters. Cross-over: 2kHz (12dB per octave). FR: 40Hz-20 kHz. HC: 15W (20W speech and music). Impedance: 8 ohms. Size: 19 × 13 × 7 $\frac{1}{2}$ in. Weight: 18 $\frac{1}{2}$ lb. Finish: teak with black/gold acoustically transparent grille cloth. Supplied in matched pairs. Price: (per pair) £49.50.

#### Monitor

Built to conform to BBC specification for monitor speakers. Full specification not available at time of going to press. Price expected to be £85-£90.



Shepard Audio range

■ **ROLA-CELESTION** See Celestion

■ **SANSUI**

Vernitron Ltd, Thornhill,  
Southampton SO9 5QF.  
Tel: Southampton 448 11.

**Sansui SL5**

Slim line speaker enclosure with units and crossover. One 6½in bass driver, one 2in tweeter, one 6½in passive radiator. HC: 20W. Impedance: 8 ohms. FR: 35Hz-20kHz. Finish: teak or soft pearl white. Size: 20 × 14½ × 5½in. Price: £39.11.

**Sansui SL7**

Slim line speaker enclosure with units and crossover. One 8in bass driver, one 1in dome tweeter, one 8in passive radiator. HC: 25W. Impedance: 8 ohms. FR: 35Hz-20kHz. Finish: teak or soft pearl white. Size: 21½ × 16½ × 6½in. Price: £42.38.

**Sansui SP30 ★**

Pipe-duct bass reflex enclosure with 6½in cone type woofer and 2in horn tweeter. HC: 20W. vci: 8 ohms. FR: 50Hz-20kHz. Crossover: 7kHz. Dimensions: 16½ × 10½ × 7½in. Weight: 9.9lb. Price: £27.11 (plus £6.63 PT).

**Sansui SP50 ★**

Horn type enclosure with units. 8in bass driver, 2in horn tweeter. Crossover: 7kHz. FR: 50Hz-20kHz. HC: 25W. Impedance: 8 ohms. Dimensions: 12½ × 9¾ × 19¾in. Weight: 19.8lb. Finish: American walnut, hand carved grille. Price: £43.13 (plus £10.54 PT).

**Sansui SP300 ★**

Reflex enclosure with four units. 12in bass driver, 5in mid-range unit, two 2in horn tweeters. Crossover: 1.5kHz and 6kHz. FR: 30Hz-20kHz. vci: 8 ohms. Special pipe ducted bass reflex design. HC: 50W RMS. Finish: American walnut. Size: 18 × 27½ × 16½in. Weight: 78½lb. Price: £97.50.

■ **SANYO**

Sanyo Marubeni (UK) Ltd,  
Sanyo House, Bushey Mill Lane,  
Watford, Herts. Tel: Watford 25354/6.

**SX-X**

Speaker enclosure with units and crossover. 8in bass driver, 2½in tweeter. Crossover frequency: 4kHz. Impedance: 8 ohms. HC: 15W. FR: 40Hz-20kHz. Size: 14½ × 8½ × 11½in. Price: £17.95.

■ **SHEPPARD AUDIO LTD**

31 Newberries Parade, Radlett, Herts.  
Tel: Radlett 5440.

**Chesham Slimline**

Infinite baffle enclosure with unit. FR: 60Hz-15kHz. HC: 10W RMS. Finish: teak. Size: 15 × 7 × 4½in. Impedance: 8 ohms. Price: £9.75.

**Chesham De Luxe**

Infinite baffle three-way system with units and crossover. HC: 10W. FR: 60Hz-20kHz. Impedance: 8 ohms. Finish: teak. Price: £18.50.

**Chesham Bookshelf**

Infinite baffle enclosure with units and crossover. Three-way system. HC: 15W RMS. FR: 40Hz-20kHz. Impedance: 8 ohms. Finish: teak, walnut or mahogany. Size: 21 × 12 × 9in. Price: £33.

**New Aldenham**

Infinite baffle enclosure with units and crossover. Four-way system employing 13½ × 8½in bass driver. HC: 20W RMS. FR: 40Hz-20kHz. Impedance: 8 ohms nominal. Finish: teak, walnut or satin mahogany. Size: 23½ × 15½ × 10in. Price: £42.50.

**Aldenham De Luxe**

Infinite baffle enclosure with units and crossover. Three-way system employing 13½ × 9in

★ Indicates entry is illustrated

bass driver, 6½in mid-range unit and HF tweeter. HC: 20W RMS. FR: 40Hz-20kHz. Impedance: 8 ohms nominal. Size: 23½ × 15 × 10in. Weight: 42lb. Finish: teak, walnut or satin mahogany. Price: £52-50.

#### **Waltham Monitor ★**

Infinite baffle cabinet with speakers and crossover. 13 × 9in bass driver, 5in mid-range unit, 1½in upper frequency unit, T27 tweeter. Crossover: 800Hz, 3-5kHz, 6-5kHz. FR: 25Hz-25kHz. HC: 25W. Impedance: 8 ohms. Size: 29½ × 15½ × 12½in. Weight: 52lb. Finish: teak or walnut (mahogany to order). ±5dB controls on mid-range and upper frequency units. Special BAF and rubber fibre acoustic damping. Optional extra: black vynide base and castors. Price: (speaker system) £65.

#### **Waltham Monitor Elite ★**

Infinite baffle cabinet with speakers and crossover. 13 × 9in bass driver, 5in mid-range unit, 1½in upper frequency unit, T27 tweeter. Crossover: 800Hz, 3-5kHz, 6-5kHz. FR: 20Hz-25kHz. HC: 30W. Impedance: 8 ohms. Size: 29½ × 17½ × 12½in. Weight: 57lb. Finish: teak or walnut (mahogany to order). Controls on mid-range and upper frequency units. Special BAF loading and rigid construction. Price: £75.

### ■ SINCLAIR RADIONICS LTD

London Road, St Ives,  
Huntingdonshire, PE174HJ.  
Tel: St Ives (Hunts) 4311.

#### **Q16**

Slim shelf-mounting enclosure with unit. High compliance full-range driver with aluminium speech coil and ceramic magnet. 11,000 gauss. HC: 14W RMS. Impedance: 8 ohms. FR: 60Hz-16kHz. Infinite baffle construction. Size: 9¾ × 9¾ × 4¾in. Finish: natural solid teak surround with black cellular foam front. Price: £8-98.

### ■ SONAB LTD

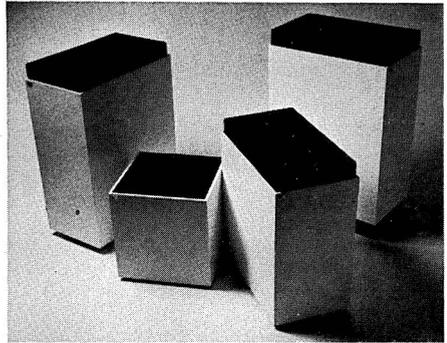
136 Mansfield Road, Acton, London, W3.  
Tel: 01-993 0849.

#### **Sonab V-1 ★**

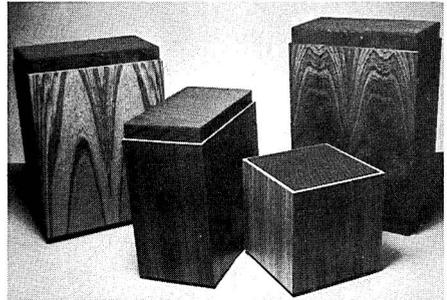
Enclosure with one upward-facing 8½in unit. FR: 49Hz-17kHz (DIN). HC: 35W (DIN). Impedance: 8 ohms. Size: 12 × 12 × 12½in. Weight: 10lb. Finish: rosewood, teak, white, red, yellow or blue. Price: £38-50 (including PT).

#### **Sonab OA-4 ★**

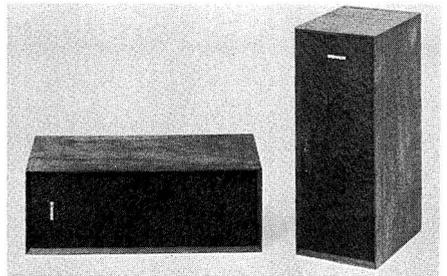
Enclosure with upward-facing 8½in bass/middle driver and three 2in tweeters. Crossover: 3-5kHz. FR: 44Hz-18kHz (DIN). HC: 35W (DIN). Impedance: about 7 ohms. Size: 11½ × 17 × 17½in. Weight: 20lb. Finish: rosewood, teak, walnut, oak or white. Price: £45.



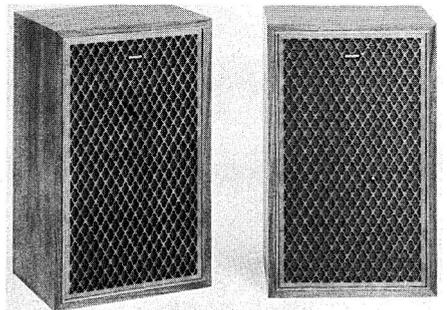
Sonab Enclosures



Sonab Enclosures



Sonics AS-57



Sonics AS-330

**Sonab OA-5 ★**

Enclosure with 8½in upward-facing bass/middle driver and four 2in tweeters. Crossover: 2.7 kHz. HC: 40W (DIN). FR: 37Hz-18kHz (DIN). Impedance: about 7 ohms. Size: 9½ × 17 × 24in. Weight: 22lb. Finish: rosewood, teak, walnut, oak, deal, white, red, blue or green. Price: £58-50.

**Sonab OA-6 ★**

Enclosure with six units and built-in bass amplifier. Units: 8½in bass driver, 8½in mid-range unit, four 2in tweeters. Bass speaker driven by 26W RMS built-in amplifier. Distortion 0.1%. Crossover: 200Hz and 2.7kHz. FR: 26 Hz-18kHz (DIN). HC: 50W (DIN). Impedance: about 7 ohms. Size: 9½ × 17 × 27in. Weight: 44lb. Finish: rosewood, walnut, teak, oak, deal or white. Price: £137-25.

**SONICS CORPORATION**

UK distributor: B. H. Morris & Co (Radio) Ltd, 84-88 Nelson Street, Tower Hamlets, London, E12DY. Tel: 01-790 4824.

**AS-57 ★**

Bookshelf speaker system with 7 × 5in unit. HC 10W (music power). vci: 8 ohms. FR: 70Hz-18kHz. Finish: walnut. Dimensions: 15¼ × 5⅞ × 8¼in. Weight: 5.06lb. Price: £15 per pair (inc. PT).

**AS-303**

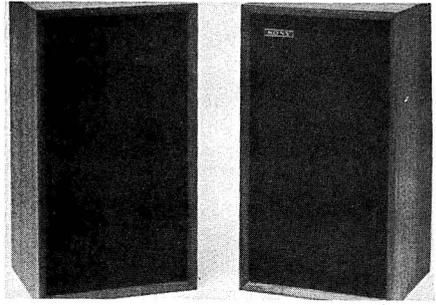
Bookshelf enclosure with three units: 12in extra low resonance woofer with a long travel voice coil; 6½in sealed back mid-range unit; and exponential horn-type super tweeter. HC: 30W (music power). vci: 8 ohms. FR: 35Hz-20kHz. Finish: walnut, hand-rubbed oil finish. Dimensions: 25 × 14¼ × 11⅞in. Weight: 26.4lb. Price: £31-50 each.

**AS-330 ★**

Five-speaker system in reflex enclosure with precision tuned pipe ducted port design. Speakers: 12in high compliance, long throw voice coil woofer; two 6½in acoustically isolated mid-ranges; and two horn-type HF tweeters. Crossover network: 3-way 12dB/oct LC type network, 600Hz and 5kHz. HC 40W (music). vci: 8 ohms. FR: 30Hz-20kHz. Rear-mounted push-button tone control. Finish: walnut, hand-rubbed oil finish. Size: 26 × 15⅞ × 11⅞in. Weight: 37.4lb. Price: £59-50 each.

**AS-440**

Pipe ducted ¾in hardwood reflex enclosure with glasswool acoustic insulation with six speakers in 4-way system. Speakers: 16in low resonance woofer; two 6½in high efficiency sealed back mid-range units; two 3½in cone type low treble units; and horn-type super high treble unit. Crossover network: 4-way 12dB/oct LC type

*Sony SS-1000*

network, 600Hz, 3.5kHz and 10kHz. HC 60W (music). vci: 8 ohms. FR: 25Hz-20kHz. Finish: walnut hand-rubbed oil finish. Dimensions: 28 × 18⅞ × 13in. Weight: 48.4lb. Price: £72 each.

**SONY (UK) LTD**

Pyrene House, Sunbury Cross, Sunbury on Thames.

Tel: Sunbury on Thames 87644/7.

**SS-1000 Monitor ★**

Infinite baffle type with three units. Bass radiator: 10 × 6in laminated glass-metal cone; upper-mid frequency unit of wide dispersion pressure type; ultra high-frequency unit with low-mass direct radiator extending response smoothly into supersonic region. HC: 10W. FR: (±5dB): better than 100Hz-25kHz. vci: 8 ohms. Weight: 15lb. Finish: walnut. Dimensions: 8 × 16½ × 8½in. Designed and made in Gt Britain by B & W Electronics to Sony specifications. Available only in matched pairs. Price (each): £32 (no PT).

**SS-2800**

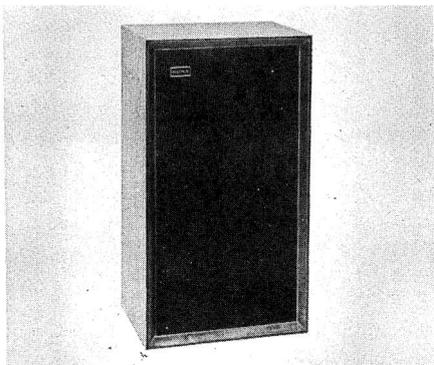
Infinite baffle type with 10in LF cone, 6½in mid-range and 2in HF horn unit. HC: 20W. FR: 40Hz-20kHz. vci: 8 ohms. Weight: 35lb. Crossover frequencies: 600Hz and 6kHz. Finish: walnut. Dimensions: 13¼ × 23¼ × 9¼in. Features high and mid-frequency level controls giving ±4dB. Price: £47-15.

**SS-3000 Monitor ★**

Infinite baffle type with three units: 13½ × 8½in bass radiator and pressure HF unit and ultra HF unit. HC 15W. FR: better than 60Hz-14 KHz (±3 dB) and 40 Hz-25 KHz (±5 dB). vci: 8 ohms. Weight: 53lb. Finish: walnut. Dimensions: 28½ × 15¼ × 11½in. Designed and made in Gt Britain by B & W Electronics to Sony specifications. Price (each): £63.

**SS-3100**

Infinite baffle type with 12in LF unit, 6½in mid-range unit and 2in horn type HF unit. Crossover frequencies: 400Hz and 5KHz. HC 30W. FR:



Sony SS-3000

30Hz-20kHz. vci: 8 ohms. Weight: 55lb. Finish: walnut. Features level controls, HF and mid-range,  $\pm 4$ dB. Price: £86.

**SS-3300 ★**

Infinite baffle type with 12in LF cone unit, 5in mid-range cone unit and 2in horn type HF unit. HC: 25W. FR: 30Hz-20kHz. vci: 16 ohms. Crossover frequencies: 500Hz and 3kHz. Weight: 90lb. Finish: eurAsian teak. Dimensions:  $22\frac{3}{4} \times 31\frac{1}{2} \times 14\frac{5}{8}$ in. Crossover unit can be switched out giving direct connections to the three units for three-channel systems. Price: £123-50.

**■ SOUND STUDIO LTD**

33-35 Camden Road, Tunbridge Wells, Kent. Tel: Tunbridge Wells 32153.

**Folded horn**

Horn type enclosure supplied with or without unit. Designed for single 8in driver. Wharfedale Super 8 RSDD or Elac 8 RM271 recommended units. FR: 40Hz-16kHz. HC: 7W approximately. Impedance: 4-8 ohms or 10-15 ohms. Size:  $28 \times 16 \times 10$ in. Finish: teak veneer. Price: (including PT) (with Wharfedale Super 8 RSDD) £22-50; (with Elac 8 RM271) £18; (cabinet alone) £15-95.

**Opus**

Reflex enclosure supplied with or without units. Designed for single 8in dual-cone or 8in with tweeter. Crossover at 3kHz when using two units. FR: 45Hz-16kHz. HC: 7W RMS. Impedance: 4-8 ohms or 10-15 ohms. Size:  $30 \times 12 \times 12$ in. Various finishes including hessian and velvet pile, gold top and frame with printed grille fabric, etc. Price: from £21.

**■ STE-MA**

Distributors: Kelgrove (Sales) Ltd, 25 Roman Road, London, E2. Tel: 01-980 1936.

**Type 300**

Infinite baffle enclosure with units and cross-overs. One 10in bass driver, one 5in mid-range unit, one  $2\frac{1}{2}$ in tweeter. Crossovers: 750Hz, 4kHz. FR: 40Hz-20kHz. HC: 18W RMS. Impedance: 8 ohms. Wall mounting brackets supplied. Size:  $25 \times 15\frac{1}{4} \times 10$ in. Finish: teak. Price: £33-60.

**Type 400**

Infinite baffle enclosure with units and cross-overs. One 8in twin cone bass and mid-range driver, one  $2\frac{1}{2}$ in tweeter. Crossover: 4kHz. FR: 50Hz-18kHz. HC: 12W RMS. Impedance: 8 ohms. Wall mounting brackets supplied. Size:  $19\frac{1}{2} \times 11\frac{1}{2} \times 9\frac{1}{2}$ in. Finish: teak. Price: £24.

**Hi-Fi 3**

Infinite baffle enclosure with units and cross-overs. One 8in bass driver, one 5in mid-range unit, one  $2\frac{1}{2}$ in tweeter. Crossovers: 1-5kHz, 6kHz. FR: 35Hz-20kHz. HC: 30W RMS. Impedance: 8 ohms. Wall brackets supplied. Conform to DIN 45 500. Size:  $19\frac{1}{2} \times 11\frac{1}{2} \times 9\frac{1}{2}$ in. Finish: teak or rosewood. Price: £44-10.

**Hi-Fi 4**

Infinite baffle enclosure with units and cross-overs. One 10in bass driver, one  $8 \times 5$ in mid-range unit, two  $2\frac{1}{2}$ in tweeters. Crossovers: 1-5 kHz, 6kHz. FR: 30Hz-20kHz. HC: 35W RMS. Impedance: 8 ohms. Teak wall brackets supplied. Size:  $25 \times 15\frac{1}{4} \times 10$ in. Finish: teak or rosewood with aluminium surround. Price: £50-40.

**■ STENTORIAN**

Whiteley Electrical (Radio) Co Ltd, Victoria Street, Mansfield, Notts. Tel: Mansfield 24762.

**C14 Thoresby Bass Reflex Corner Console**

Designed to utilise acoustic properties of walls. Takes 8in or 10in units with provision for tweeter. Size:  $31 \times 19\frac{3}{8} \times 17$ in. Choice of mahogany (C14) or walnut (C14A) finish. Price: (C14 mahogany) £22-38 (plus £2-22 PT); (C14A walnut) £22-85 (plus £2-27 PT). Cabinet only without speaker units.

**C15 Thoresby Bass Reflex Console**

Designed for 8in or 10in units with provision for tweeter. Size:  $31 \times 19\frac{3}{8} \times 18$ in. Choice of mahogany (C15) or walnut (C15A) finish. Prices: (C15 mahogany) £24-25 (plus £2-41 PT); (C15A walnut) £24-98 (plus £2-48 PT). Cabinet only without speaker units.

**LC93**

Infinite baffle enclosure with unit. One 9in HF912-67 speaker unit. FR: 60Hz-20kHz. HC: 10W RMS. Impedance: 15 ohms. Acoustically loaded cabinet. Speaker has graded melaminated c14 with silicon rubber-over-cambic suspen-

sion. Size:  $19 \times 12\frac{1}{2} \times 8\frac{1}{2}$ in. Weight: 20lb. Finish: teak or rosewood veneer. Price: (teak) £16.83 (plus £4.16 PT); (rosewood) £18.13 (plus £4.48 PT).

**LC94**

Labyrinth enclosure with unit. One 9in HF912-67 speaker unit. FR: 45Hz-20kHz. HC: 10W RMS. Impedance: 15 ohms. Acoustic labyrinth with acoustic resistance incorporated in pipe. Special 9in speaker as fitted in LC93. Size:  $29\frac{1}{2} \times 23\frac{3}{4} \times 6\frac{1}{8}$ in. Weight: 39lb. Finish: oiled teak or rosewood veneer. Price: (teak) £25.90 (plus £6.40 PT); (rosewood) £27.60 (plus £6.82 PT).

**LC95**

Reflex enclosure with units. One 12in HF1214-67 bass driver, one 8in T812-67 mid- and upper-frequency speaker. Crossover:  $\frac{1}{4}$ -section L/C 1kHz. FR: 27Hz-20kHz. HC: 15W RMS. Impedance: 15 ohms. Acoustically loaded bass reflex cabinet. 12in unit melamine treated paper cone with cambric surround, 8in unit melamine treated paper ribbed cone and surround. Size:  $31\frac{1}{2} \times 20\frac{1}{2} \times 13\frac{1}{2}$ in. Weight: 62lb. Finish: oiled teak or rosewood veneer. Price: (teak) £58.59; (rosewood) £61.05.

**■ TANDBERG**

Farnell-Tandberg Ltd, 81 Kirkstall Road, Leeds, LS3 1HR.  
Tel: Leeds 35111.

**Tan 7 ★**

Infinite baffle in teak or rosewood with  $6 \times 10$ in and 2in units. HC: 20W music power. FR: 60Hz-16kHz. vci: 3.2 ohms. Dimensions:  $20\frac{1}{2} \times 10 \times 10\frac{1}{4}$ in. Prices: (teak) £28.50 (including PT); (rosewood) £30.80 (including PT).

**Tan 10 and Tan 11**

Infinite baffle speakers in teak with  $6\frac{1}{2}$ in and 2in units. HC: 20W music. FR: 60Hz-16kHz. vci: 4 ohms. Dimensions: Tan 10,  $7\frac{1}{8} \times 9\frac{1}{8} \times 9\frac{1}{4}$ in; Tan 11,  $12\frac{5}{8} \times 6 \times 8\frac{1}{2}$ in. Price: (teak) £19.30 (including PT); (rosewood—Tan 11 only) £21.50 (including PT).

**Tan 12 ★**

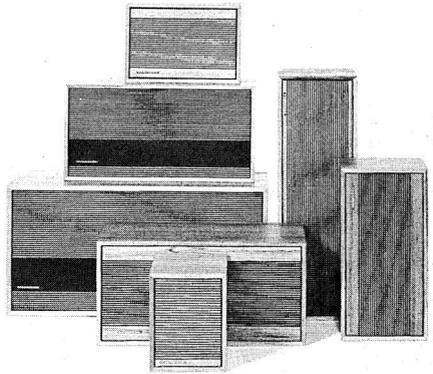
Infinite baffle with  $6\frac{1}{2}$ in and 2in units. HC: 20W music. FR: 50Hz-16kHz. vci: 4 ohms. Dimensions:  $17\frac{1}{4} \times 7\frac{1}{2} \times 8\frac{1}{2}$ in. Price: (teak) £21.80 (including PT).

**Tan 13**

Infinite baffle with  $6 \times 10$ in and 2in units. HC: 20W music. FR: 60Hz-16kHz. vci: 3.2 ohms. Dimensions:  $25 \times 9\frac{1}{4} \times 8\frac{1}{4}$ in. Price: (teak) £29.80 (including PT).

**Tan 15 ★**

Infinite baffle with 12in, 5in and  $2\frac{1}{2}$ in units. HC: 45W music. FR: 35Hz-16kHz. vci: 4 ohms.



*Tandberg speaker enclosures*

Dimensions:  $27\frac{1}{2} \times 11 \times 13\frac{3}{4}$ in. Prices: (teak) £45 (no PT); (rosewood) £47.30 (no PT).

**Tan 17**

Infinite baffle with 8in,  $4 \times 7$ in and  $2\frac{1}{2}$ in units. HC: 30W. FR: 35Hz-16kHz. vci: 4 ohms. Dimensions:  $20\frac{1}{2} \times 10 \times 10\frac{1}{4}$ in. Prices: (teak) £37.30 (no PT); (rosewood) £39.50 (no PT).

**Tan 18**

(Teak) £21.50 (including PT); (rosewood) £23.30 (including PT).

**Tan 19**

(Teak) £23.80 (including PT); (rosewood) £25 (including PT).

**Tan 20**

(Teak) £24.50 (including PT); (rosewood) £27 (including PT).

**■ TANNoy**

Tannoy Products Ltd, West Norwood, London, SE27.

Tel: 01-670 1131. Cables: Tannoy, London.

**III.LZ Mk II ★**

Infinite baffle forward facing. Monitor Gold III. LZ dual concentric unit with crossover network. FR: 30Hz-20kHz. Size:  $14 \times 10\frac{3}{4} \times 23\frac{1}{4}$ in. Price: £41.

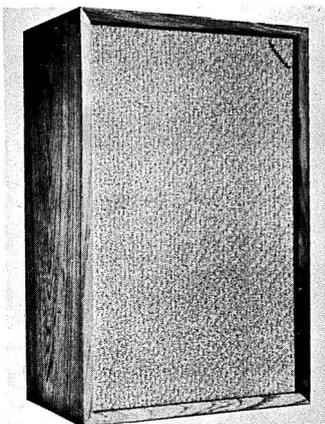
**Lancaster ★**

Reflex (single port) forward facing. Free-standing. One Monitor Gold 12in with crossover network. Size:  $33\frac{1}{2} \times 21\frac{1}{2} \times 12\frac{1}{2}$ in (including 2in plinth). Price: £56.50.

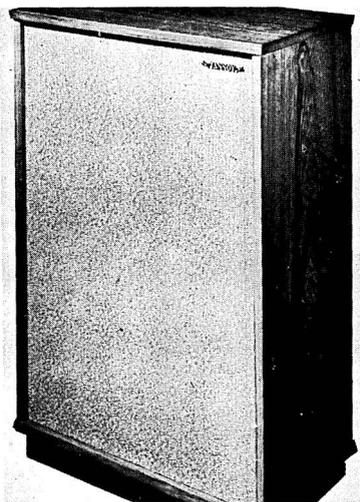
**Lancaster**

Reflex (single port) forward facing. Corner placing. One Monitor Gold 12in with crossover network. Size:  $33 \times 25 \times 16\frac{1}{2}$ in (including 2in plinth). Price: £56.50.

★ Indicates entry is illustrated



Tannoy Monitor III.LZ Mk II



Tannoy Lancaster 12 or 15

#### Lancaster

Aperiodic free-standing enclosure. One Monitor Gold 15in with crossover network. Size:  $33\frac{1}{2} \times 21\frac{1}{2} \times 12\frac{1}{2}$ in (including 2in plinth). Price: £63.25.

#### Lancaster

A periodic corner-standing enclosure. One Monitor Gold 15in unit with crossover. Size:  $33 \times 25 \times 16\frac{3}{4}$ in (including 2in plinth). Price: £63.25.

#### Rectangular York

Reflex (single port) enclosure. Forward facing. Complete with Monitor Gold 15in dual concentric unit with crossover. Crossover: 1kHz.

FR: 23Hz-20kHz. Size:  $15 \times 23\frac{1}{2} \times 42$ in. Price: £80.75.

#### York

Reflex enclosure. Forward facing unit. Dual throated ports. Corner placing. One Monitor Gold 15in dual concentric unit with crossover. FR: 35Hz-20kHz. Size:  $45\frac{1}{2} \times 32 \times 22\frac{1}{2}$ in. Price: £80.75.

#### Rectangular GRF

Single folded horn. Forward facing with front exits. Complete with one Monitor Gold 15in dual concentric unit. Crossover: 1kHz. FR: 23Hz-20kHz. Size:  $17\frac{1}{4} \times 23\frac{1}{2} \times 42$ in. Price: £110.75.

#### Corner GRF ★

Folded horn. Rear loaded horn, forward facing unit. Corner placing. One Monitor Gold 15in dual concentric unit. FR: 20Hz-20kHz. Size:  $48 \times 38 \times 29$ in. Price: £127.75.

#### Guy R. Fountain Autograph

Folded horn. Front and rear horn loaded unit. Corner placing. One Monitor Gold 15in unit with crossover. FR: 20Hz-20kHz. Size:  $58\frac{1}{2} \times 43 \times 26\frac{1}{2}$ in. Price: £170.75.

Tannoy III.LZ Mk II and Lancaster speakers available in various finishes including teak, mahogany and walnut. York, GRF and Guy R. Fountain Autograph available in walnut only.

#### ■ TELEFUNKEN

Distributors: AEG (Great Britain) Ltd, AEG House, Chichester Rents, Chancery Lane, London, WC2. Tel: 01-242 9944.

#### RB40/41

System comprising two units:  $5\frac{1}{2}$ in bass driver and  $5 \times 3$ in mid/treble unit. vci: 4 ohms. HC: 15W. FR: 50Hz-20kHz. Finish: walnut. Dimensions:  $9\frac{3}{4} \times 6\frac{3}{4} \times 6\frac{3}{4}$ in. Price: £12.78 (plus £2.97 PT).

#### WB60/61

Enclosure comprising two units:  $5\frac{1}{2}$ in bass driver and  $5 \times 3$ in mid/treble unit. HC: 15W. FR: 45Hz-18kHz. Finish: teak. Dimensions:  $18\frac{1}{2} \times 6\frac{1}{2} \times 10$ in. Price: £19.18 (plus £4.45 PT).

#### RB70H

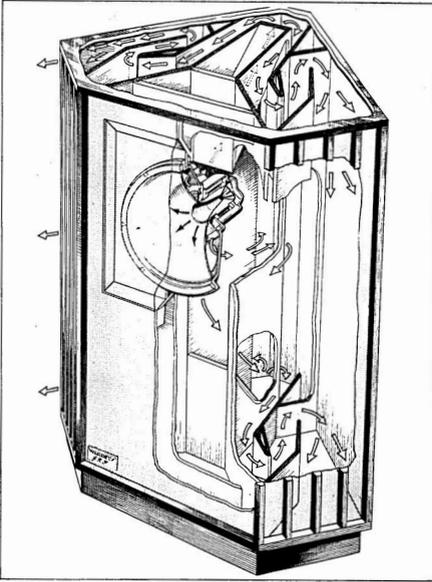
Enclosure comprising two units: 8in bass driver and  $7 \times 5$ in mid/treble. vci: 4ohms. HC: 25W. FR: 40Hz-18kHz. Finish: teak. Dimensions:  $21 \times 10\frac{1}{4} \times 9\frac{1}{4}$ in. Price: £23.44 (plus £5.44 PT).

#### L250 Hi-Fi

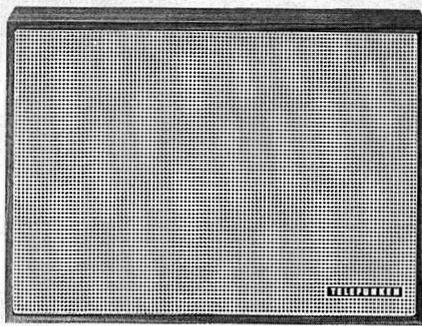
Enclosure comprising three units: 8in bass driver and two  $5 \times 3$ in mid/treble units. vci: 4 ohms. HC: 35W. FR: 35Hz-20kHz. Finish: walnut. Dimensions:  $18 \times 7\frac{1}{2} \times 12\frac{3}{4}$ in. Price: £34.52 (plus £8.01 PT).

#### WB50 ★

Speaker system comprising enclosure with units.



*Tannoy Corner G.R.F.*



*Telefunken WB.50*

5½in bass driver, 5 × 3in mid-range/treble unit. vci: 4 ohms. HC: 15W. FR: 45Hz-18kHz. Finish: Stradivari. Dimensions: 16¼ × 12 × 4¼in. Price: £17.47 (plus £4.05 PT).

■ **TELETON**

Teleton Electro (Distributors) Co Ltd, Teleton House, Robjohns Road, Widford, Chelmsford, Essex. Tel: Chelmsford 62442. Telex: 993338.

**SA 1003**

Closed compact box. 4in unit. Impedance: 4 ohms (1003/4 model) or 8 ohms (1003/8). HC: 8W max, 5W RMS. FR: 70Hz-16kHz. Finish:

walnut. Dimensions: 6¼ × 9¼ × 5in. Price: £5.25. (including PT).

**SB 1202**

Closed compact box. 5in woofer, 3in tweeter. Impedance: 4 or 8 ohms. HC: 15W max, 10W RMS. FR: 50Hz-20kHz. Finish: walnut. Dimensions: 7¼ × 12¼ × 6¼in. Price: £11.50 (including PT).

**SB 1602**

Open compact box. Four special 6½in units and 2½in tweeter. HC: 20W max, 15W RMS. Impedance: 4 or 8 ohms. FR: 50Hz-20kHz. Finish: walnut. Dimensions: 18¼ × 22¼ × 4in. Price: £18 (including PT).

**SB 25**

Closed compact box. 10in woofer, 2½in tweeter. Impedance: 8 ohms. HC: 20W max, 15W RMS. FR: 50Hz-20kHz. Finish: walnut. Dimensions: 12¼ × 22¼ × 10½in. Price: £32 (including PT).

**SD 2100**

Closed compact box. 12in woofer, 6in mid-range, 2½in cone tweeter. Impedance: 8 ohms. HC: 50W max, 35W RMS. FR: 40Hz-20kHz. Finish: walnut. Dimensions: 14¾ × 25 × 11¾in. Price: £35.50 (including PT).

■ **TRIPLETONE MANUFACTURING CO LTD**

Factory No. 1, 138 Kingston Road, Wimbledon, SW19. Tel: 01-542 1189.

**Concerto Mk II ★**

Bass reflex enclosure employing twin-cone full-range 8in driver and 4in tweeter. FR: 40Hz-18kHz. HC: 10W RMS. vci 2-3 ohms, 8 ohms or 15 ohms. Size: 19½ × 13¼ × 9in. Weight: 19lb. Finish: teak. Suitable for horizontal or vertical mounting. Price: £15.30 (no PT).

■ **VIDEOTON**

Distributors: Radio and Electronic Distribution Co, 55-63 Goswell Road, London, EC1. Tel: 01-253 1802.

**D132E**

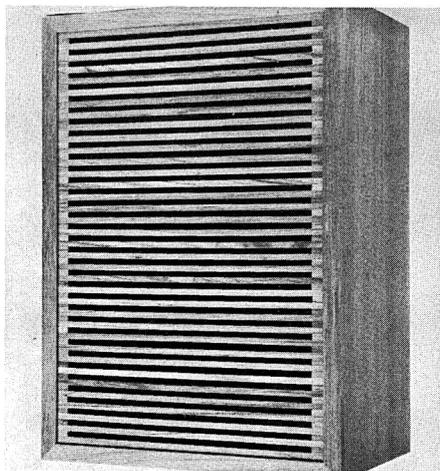
Bookshelf enclosure with units. One 5½in bass driver, one 4in tweeter. HC: 15W RMS. FR: 45Hz-20kHz. Impedance: 4 or 8 ohms. Finish: teak, walnut or coloured. Size: 10¼ × 8¾ × 6in. Weight: 9lb. Price: to be announced.

**DP202E**

Bookshelf enclosure with units. One 8in bass driver, one 4in tweeter. HC: 20W RMS. FR: 40Hz-20kHz. Impedance: 4 ohms. Finish: teak, walnut or coloured. Size: 14 × 9½ × 8¾in. Weight: 17lb. Price: to be announced.

**DF202E**

Wall mounting enclosure with units. One 8in bass driver, one 4in tweeter. HC: 20W RMS.



Tripletone Concerto Mk II

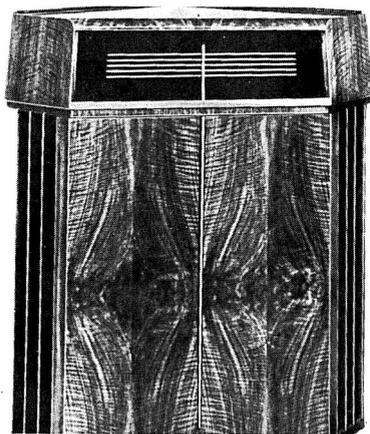
FR: 45Hz-20kHz. Impedance: 4 ohms. Finish: teak, walnut or coloured. Size: 21 × 13 × 4½ in. Weight: 17lb. Price: to be announced.

**D252E**

Floor-standing enclosure with units. Screw-on legs. One 10in bass driver, one 4in tweeter. HC: 20W RMS. FR: 35Hz-20kHz. Impedance: 4 or 8 ohms. Finish: teak, walnut or coloured. Size: 23½ × 13½ × 12½ in. Weight: 35lb. Price: to be announced.

**D253E**

Floor-standing enclosure with units. Screw-on legs. One 10in bass driver, two 4in tweeters. HC: 25W RMS. FR: 35Hz-20kHz. Impedance: 4 or 8 ohms. Finish: teak, walnut or coloured. Size: 23½ × 13½ × 12½ in. Weight: 35 lb. Price: to be announced.



Vitavox Klipschorn

■ **VITAVOX LTD**

Westmoreland Road, London, NW99RJ.  
Tel: 01-204 4234. Cables: Vitavox, London.

**Klipschorn ★**

Double channel horn system. Folded LF horn with AK155 drive unit. Forward-facing HF horn with S2 pressure unit. Filter network incorporated. Crossover: 500Hz., FR: 30Hz-15 kHz. High translational efficiency. Size: 51 × 30 × 27in. Price: £400.

**Bitone Series 3200**

Double channel sound system comprising three-cell horn (distribution 60° wide × 20° high) with 12in LF driver in vented enclosure. Filter network 1kHz crossover attenuation 12dB per octave. HF balance control 0-8dB attenuation. HC: 20W. FR: 50Hz-15kHz. Size: 24 × 20 × 19in. Price: on application.

**Bitone Series 6200**

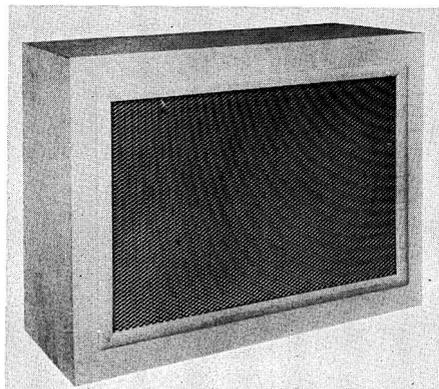
Similar specification to 3200 but with six-cell horn giving distribution 60° wide × 40° high. Size: 29 × 20 × 20in. Price: on application.

**Bitone Major**

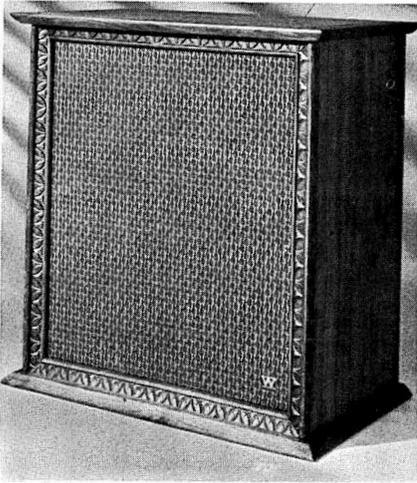
Double channel sound system comprising HF dispersive horn and S.2 HF pressure unit (distribution 90° wide × 20° high) with 15in LF driver in special reflex enclosure. Filter network 500 kHz. Crossover attenuation 12dB/octave. HF balance control 0-8dB attenuation. HC: 30W. FR: 35Hz-16kHz. Size: 42 × 30 × 24in. Price: (whitewood) £252; (studio) £272.

**Mini Bitone ★**

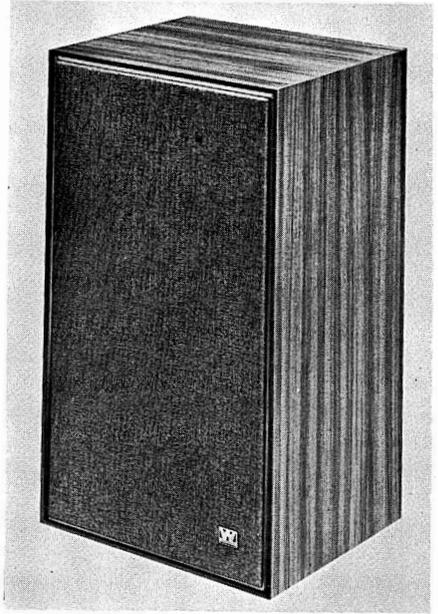
Double channel sound system comprising horn and infinite baffle enclosure. 12in AK124 cone type bass driver, GP2 high frequency pressure unit. Crossover: 1kHz. FR: 50Hz-15kHz. HC: 20W RMS. Impedance: 100V line. Finish: teak. Size: 24 × 18 × 9in. Price: £110.



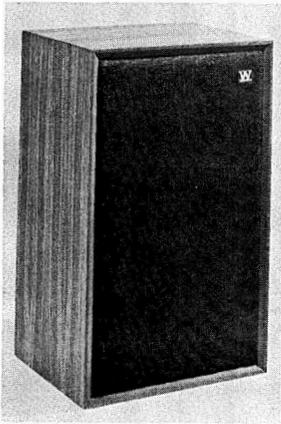
Vitavox Mini-Bitone



Wharfedale Rosedale



Wharfedale Dovedale III



Wharfedale Melton



Wharfedale Denton

■ WHARFEDALE

Rank Wharfedale Ltd, Bradford Road, Idle, Bradford, Yorks. Tel: Bradford 612552.

**Denton** ★

Two-unit enclosure. 8in bass driver, 3in tweeter. Crossover: 1.75kHz. FR: 65Hz-17kHz. vci: 4-8 ohms. HC: 15W RMS. Finish: oiled teak or polished walnut. Size:  $9\frac{1}{2} \times 14 \times 8\frac{3}{4}$ in. Price: (sold in pairs only) £31.92 (plus £7.98 PT) per pair.

**Dovedale III** ★

Infinite baffle enclosure with 1in tweeter, 5in mid-range and 12in bass speakers. Crossover: 450Hz and 3kHz. FR: 40Hz-20kHz. HC: 35W RMS. vci: 4-8 ohms. Dimensions:  $24 \times 14 \times$

12in. Finish: teak or walnut. Electro-mechanical crossover system. Price: £42.50.

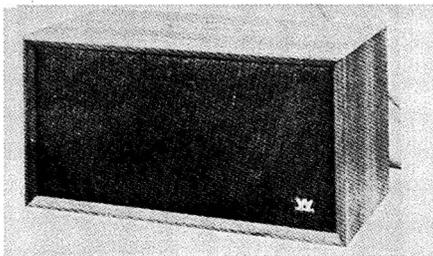
**Melton** ★

Infinite baffle enclosure with 3in tweeter and 12in bass speakers. Crossover: 1500Hz. FR: 45Hz-17kHz. HC: 25W RMS. vci: 4-8 ohms. Dimensions:  $21 \times 13 \times 10\frac{1}{4}$ in. Finish: teak or walnut. Price: £32.50.

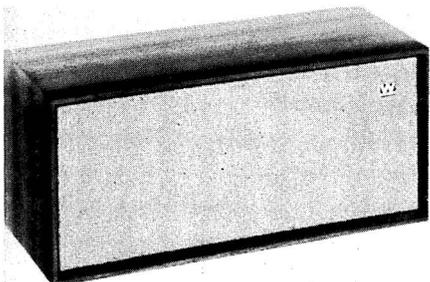
**Rosedale** ★

Infinite baffle enclosure with 1in tweeter, 5in mid-range and 15in bass speakers. Crossover: 450Hz and 3kHz. FR: 35Hz-20kHz. HC: 45W RMS. vci: 4-8 ohms. Dimensions:  $24 \times 23 \times 13\frac{1}{4}$ in. Finish: teak or walnut. Period style cabinet. Price: £65.

★ Indicates entry is illustrated.



Wharfedale Super Linton



Wharfedale Triton

#### Super Linton ★

Two-unit enclosure. 8in bass driver, 3in tweeter. Crossover: 1.75kHz. FR: 55Hz-17kHz. vci: 4-8 ohms. HC: 15W RMS. Finish: oiled teak or polished walnut. Size: 19×10×10in. Price: (sold in pairs only) £39.92 (plus £9.98 PT) per pair.

#### Triton ★

Infinite baffle enclosure with units and crossover. One 8in bass driver, one 5in mid-range unit, one 1in CAB dome multi-directional tweeter. All units forward-facing. Crossover: seven element three-way. FR: 55Hz-20kHz. HC: 18W RMS. Impedance: 4-8 ohms. Finish: teak or walnut. Floor-standing or bookshelf system. Size: 21¼×9¼×9in. Price: (sold in pairs only) £59.90 per pair.

#### ■ WHITELEY ELECTRICAL

See Stentorian.

#### ■ WOOLLETT AUDIOSTATICS

21 Anerley Station Road, London, SE20.

Tel: 01-778 9003.

#### Claremont ★

Electrostatic mid-range and HF system. Constant charge push-pull electrostatic unit. Crossover 1.6kHz, -6dB/octave. FR: 1.6kHz-20kHz. HC: 20W RMS. Impedance: 16 ohms.

Cabinet contains mains polarising unit, crossover, phase corrector for transistor amplifier: depolarising circuit, pre-set treble attenuator (12dB range). Mains 200-250V (100-125V to order). Finish: veneered wood, with Vynair. Size: 11½×8¾×8¼in. Weight: 4lb 12oz. Price: £22.75.

#### Kelsey Bass

Infinite baffle frontal-loaded enclosure intended for use as a bass speaker. Small/large room middle switching. Unit 12in foam surround. FR: 20Hz-5kHz. HC: 20W. vci: 16 ohms. Finish: veneered wood. Size: 33¼×18×14in. Weight: 52lb. Price: £44.

#### Frensham Bass ★

Similar specification to Kelsey Bass but in horizontal cabinet on 6in legs. Small/large room middle switching. Cabinet size: 31×14¼×16in. Price: £44.

#### Leven

Similar specification to Claremont but in bow-fronted cabinet 10×8½×8½in. Price: £21.50.

#### Grasmere Moderna

Infinite baffle enclosure with frontal-loading. 12in bass driver plus push-pull constant charge electrostatic. Crossover: 1.6kHz (¼-section). FR: 20Hz-20kHz. HC: 20W RMS. Impedance: 16 ohms (8-ohm transformer available). Variable treble and middle range. Size: 34×18×14in. Weight: 52lb. Finish: matt white, wood veneer and black fabric. Price: £58.75.

#### Grasmere Futura

Similar size and specification to the Moderna but with white front, teak and black fabric. Price: £58.75.

#### Como

Enclosure with units. 12in low-resonance bass driver, 2in treble, short horn loaded. FR: 60Hz-16kHz. HC: 16W. Finish: wood veneer and black. Size: 19½×14¼×12in. Weight: 24lb. Equalised duo-dynamic system. Price: £29.75.

#### Addabass

Add-on bass chamber for use with Como system. Gives large-speaker bass and serves as floor stand. Price: £12.80.

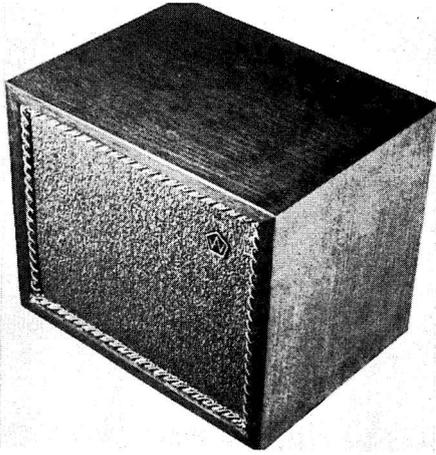
#### Esdiyn

A 'do-it-yourself' constant-charge electrostatic and 12in low-resonance dynamic driver supplied in-the-white for customer to finish to own requirements. FR: 40Hz-20kHz. HC: 20W RMS. Size: 31×18×14¼in. Weight: 48lb. Impedance: 16 ohms (transformer available for other impedances). Price: £41.

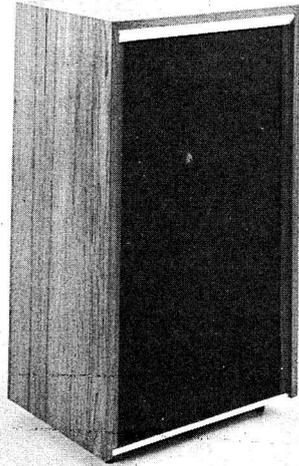
#### ■ WORDEN AUDIO DEVELOPMENTS LTD

54 Chepstow Road, London, W2.

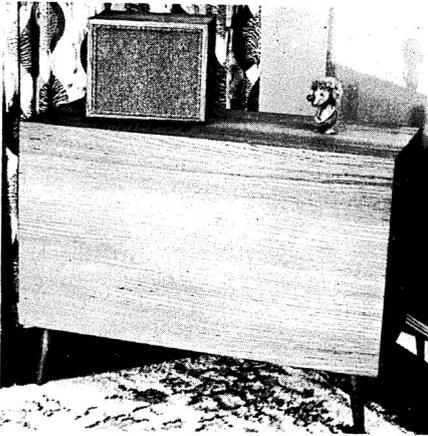
Tel: 01-229 4996.



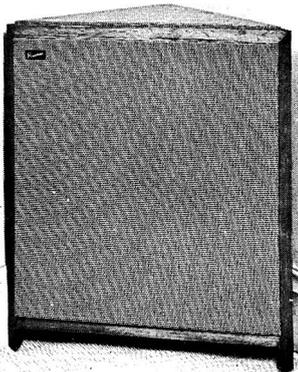
*Woollett Claremont*



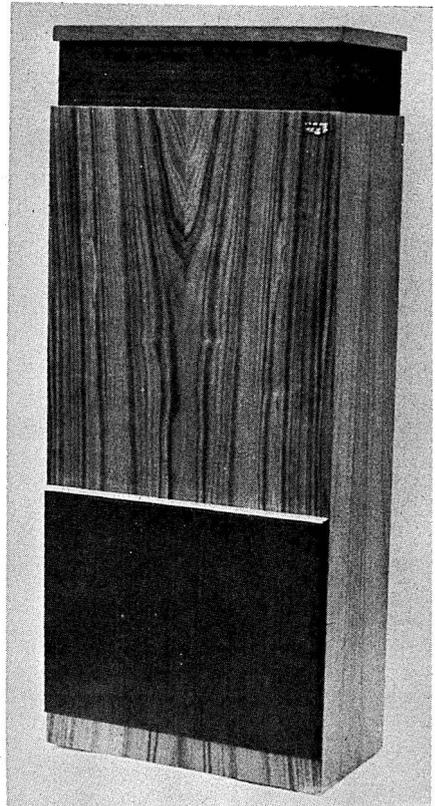
*Wye Electronics 500*



*Woollett Frensham and electrostatic*



*Worden Panosona-three versions*



*Wye Electronics 1300 column*

### Panasona Reproducer ★

Double horn with diffusing chamber. Corner reproducer, designed for near plane-wave distribution from single speaker unit. Available in three versions: (Model A) Size: 54in high, 24in wide, 14½in to corner. FR: (with Lowther PM6 or PM7) 20Hz to over 18kHz. (Model B) Size: 48in high, 21½in wide, 12½in to corner. FR: (with Richard Allan CG8T) 30Hz-17kHz; (Model C) Size: 27in high, 24in wide, 13in to corner. FR: (with Richard Allan CG8T) 30Hz-17kHz. Prices: Model A (speaker enclosure only) £56; Model B (enclosure only) £46; Model C (enclosure only) £36. Lowther PM6 £21.50; PM6 Mk I £24.50; PM7 £33; Richard Allan CG8T £7.36. All prices include PT where applicable.

### Panasona Bookshelf Speaker

Designed in accordance with the principles of the Panasona Corner Reproducers. Size: 16 × 9 × 9½in. Recommended drive units: Richard Allan CG8T £7.36 (including PT). Standard finish: teak. Other finishes to order. Contrasting Tygan or Vynair front covering. Price: (enclosure only) £21 including purchase tax.

### WYE ELECTRONICS LTD

Queen Street North, Whittington Moor,  
Chesterfield, Derbyshire.  
Tel: Chesterfield 51116.

### Stereo 500 ★

Compact two-unit enclosure. 6½in high flux bass driver, 3½in tweeter. Rear-mounted socket and

9ft connecting lead. Finish: rosewood or teak. Size: 13½ × 8½ × 8½in. Price: £14.11 (including PT)

### Stereo 525

Two-unit enclosure. 13 × 8in bass with aluminium centre cone and 3½in HF tweeter. FR: 25Hz-18kHz. HC: 10W RMS. vci: 4 ohms. Crossover: 5kHz. Size: 19½ × 12 × 8½in. Price: £19.95.

### 1300 Hi-Fi ★

Two-unit column enclosure speaker with 12in bass unit and HF1300 3in tweeter. FR: 25Hz-15kHz. vci: 4, 8, 16 ohms. Crossover: 3kHz. Size: 36 × 15 × 7½in. Price: £37.80.

### YAMAHA

Distributors: Jonathan Fallowfield Ltd,  
56-60 St John Street, London, EC1.  
Tel: 01-253 7591.

### NS10

Open baffle cabinet with units. One 18 × 12½in bass and mid-range driver, one 2in tweeter.

### NS15

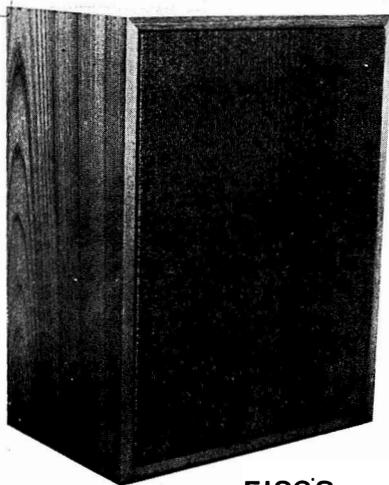
Open baffle cabinet with units. One 20 × 15in bass and mid-range driver, one 2in tweeter.

### NS20

Open baffle cabinet with units. One 27 × 20in bass driver, one 8in mid-range unit, one 2in.

### NS30

Open baffle cabinet with units. One 35 × 25in bass driver, one 12in mid-range unit, one 2in. Further details and prices on request.



**E138S**

13" × 8" TWIN CONE SPEAKER.

IMPEDANCE 15 ohms H. W. D.  
POWER HANDLING 18" × 13½" × 9"  
20 WATTS PEAK 258 × 342 × 228mm  
FITTED ACOUSTIC WADDING.

## PERFORMANCE AT ITS HIGHEST

That's the promise K.F. make on their range of Hi-Fi equipment designed to ensure the highest possible standard of reproduction when used within the designed power outputs as stated.

- High standard Teak Veneer.
- MELAMINE Finish.
- Guaranteed in finish & performance.
- £12.98

SEND FOR OUR LATEST BROCHURE  
AND PRICE LIST CONTAINING DETAILS  
OF OUR EXTENSIVE RANGE OF  
EXTENSION SPEAKERS, CABINETS AND  
PUBLIC ADDRESS EQUIPMENT.

**K. F. PRODUCTS LTD**  
**HOPESCARR**

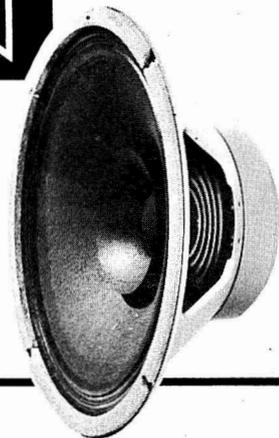
STOCKPORT, CHESHIRE. Tel: 061-480 7428.

# Celestion



## NEW CELESTION LOUDSPEAKERS

MODEL: PS12 TC-1798  
TYPE: DUAL CONE 12"  
RANGE: 40Hz - 12KHz  
POWER: 20 WATTS RMS  
FLUX: 128,000 MAXWELLS  
IMPEDANCE: 15 or 4-8 OHMS



\* recommended for Unilex



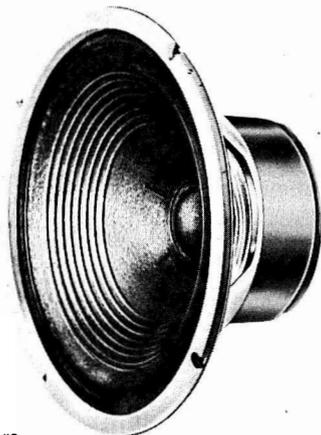
### *The Celestion "Ditton 120"*

Placed in top Hi-Fi class by reviewers  
Supplied in matched pairs — Teak or Walnut  
Superb Performance

## CELESTION 'POWER RANGE'

MODEL: G12M  
RANGE: 40Hz - 8KHz  
POWER: 25 WATTS RMS  
FLUX: 145,000 MAXWELLS  
IMPEDANCE: 8 or 15 OHMS

MODEL: G12H  
RANGE: 40Hz - 8KHz  
POWER: 30 WATTS RMS  
FLUX: 180,000 MAXWELLS  
IMPEDANCE: 8 or 15 OHMS



### **'POWER RANGE'**

The finest Loudspeakers made for electronic guitars

## ROLA CELESTION LIMITED

DITTON WORKS, FOXHALL ROAD, IPSWICH, SUFFOLK IP3 8JP

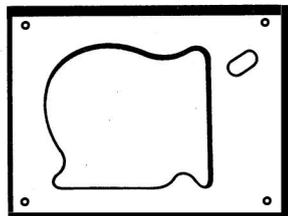
Telephone (0473) 73131

Telex 98365

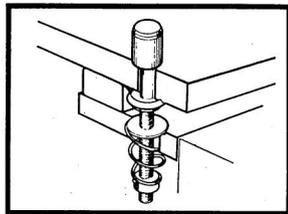


## MODEL 2000 PLINTH SYSTEM

The SME model 2000 plinth system is more than a handsome and convenient housing for your turntable and SME precision pick-up arm. It meets the mechanical requirements under which the best performance will be obtained. High-quality workmanship is combined with ease of assembly. The basic unit is finished in selected veneers of teak, straight-grained walnut, or rosewood. A one-piece hinged lid in heavy acrylic is reinforced with a polished stainless-steel trim.



*Motor boards in matching veneers are ready cut and drilled for screwdriver assembly with the appropriate pick-up arm and turntable. An uncut board is also available.*



*Four-point spring suspension adjustable for height and damping protects the motor board from acoustic feedback and external vibration.*

# SME

Write for details to: **SME LIMITED · STEYNING · SUSSEX · ENGLAND**

# Hi Fi Cabinets

system available. Full details and prices one request.

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ A. DAVIES & CO

56 Wellesley Road, London, NW5.  
Tel: 01-485 5775.

### Handmade cabinets

Cabinets for most makes of equipment and speaker units. Standard range of cabinets or individually designed units made to order. Standard finishes: sapele, oak, walnut, teak or veneer to choice. Polished or satin finish.

## ■ DYNATRON RADIO LTD

St Peters Road, Furze Platt, Maidenhead.  
Berks. Tel: Maidenhead 23331.

### RSU1 ★

Record storage and equipment console with rails to accommodate Dynatron models HFC30, HFC31, HFC32, TVR26 or P100. Inside has shelf which can accommodate TVR26, 45rpm records, tape or other accessories. Sectioned vertical space for approximately 150 LPs. Full-length lockable doors. Mounted on castors. Finish: teak. Price: £25 (inc. PT).

### RSU3 ★

Walnut-finish Queen Anne period cabinet with shelf for TVR26 tuner-amplifier and space for about 150 LPs. Mounted on castors. Size:  $23\frac{1}{2} \times 21\frac{1}{4} \times 14\frac{3}{4}$  in. Price: £39-50 (inc. PT).

### RSU2

Modern-style teak-veneered cabinet with drop-down front for sorting records. Top will accommodate audio units. Space for about 250 LPs. Price: £31-50 (inc. PT).

## ■ EATON AUDIO FITMENTS

Leopold Street, Long Eaton, Nottingham,  
NG104QF. Tel: Long Eaton 2662/2818.

Speaker, amplifier, tuner and record cabinets made to customers' requirements. Submit full details for quotation. See also Speaker Enclosure Section.

### Mullard Unilex system

Cabinets suitable for the Mullard Unilex stereo

## ■ A. R. FRANKLIN

(Audio Engineer), 4 Birch House, Penge,  
London, SE20. Tel: 01-659 0912.

### Custom Built cabinets

Equipment housings in teak veneer or white laminated plastic. Suitable for most transcription units, tape decks and amplifier units. Screw-on legs. Standard size:  $20 \times 16 \times 10$  in. Price: (standard size) £18, (special sizes) from £20.

### Period cabinets

Variations on the Queen Anne style. Chest includes front flaps, half lids, carved legs and shaped lid mouldings. Individually styled to suit customer. Prices from £60 according to specification.

## ■ HAMPSTEAD HIGH FIDELITY

91 Heath Street, Hampstead, London, NW3.  
Tel: 01-435 6377 and 0999.

### Hampstead ★

Low upright cabinet with split lift-up lids. Takes gram unit and tape deck. Pull out front hopper for tuner and control unit or integrated amplifier. Accommodates any control unit or integrated amplifier not exceeding 14in in depth. Available with well to hold complete tape recorder not exceeding 9in high. Space to take Ferrograph or Revox with professional spools. Size: (standard model)  $40 \times 26 \times 21$  in. Finish: teak or mahogany, other finishes to order. Price: (teak or mahogany) £58; quotations given for special finishes.

### Heath ★

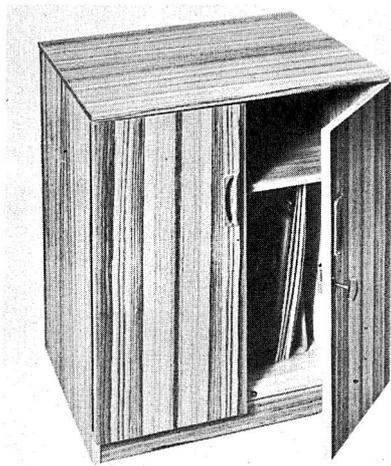
Equipment cabinet specially designed to accommodate Quad/Leak units mounted horizontally in top section, together with record deck. Base of cabinet will house 250 records or tape recorder and smaller number of records. Split lids with flap-back to expose amplifier control panel only. Size:  $34 \times 26 \times 20$  in. Finish: teak, larch, mahogany, walnut or other special finishes to order. Price: (teak) £49. Doors (optional extra) £8; dividers (optional extra) £4.

Special cabinets and fitments made to order. Designs and drawings prepared for complete room or house hi-fi schemes.

## ■ HOLDER PEARCE LTD

66 Grove Road, Eastbourne, Sussex.  
Tel: Eastbourne 26565.

\*Built-in or free-standing equipment cabinets designed and built to meet customers' exact



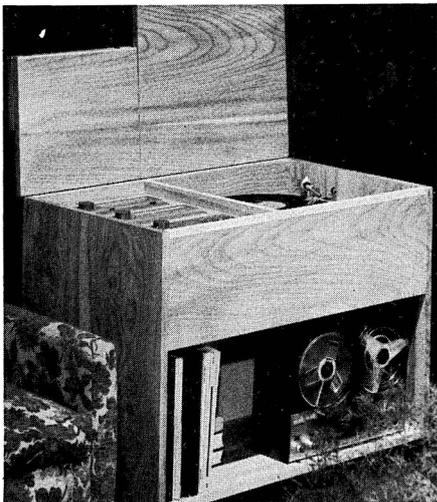
*Dynatron RSU1*



*Hampstead High Fidelity*



*Dynatron RSU.3*



*Hampstead Hi-Fi Heath Cabinet*

requirements. Lift-up or drop-down lids, accommodation to suit any equipment, all standard finishes and also special finishes to blend with furnishing. Details and prices on application.

■ **HOWLAND-WEST LTD**

2 Park End, South Hill Park, London, NW3.

Tel: 01-794 6666/6033.

**Clearview HW1**

Cabinet in teak, walnut or rosewood. Takes

gram unit or tape deck. Lift-off Perspex lid. Overall size:  $18\frac{1}{2} \times 16\frac{1}{2} \times 8\frac{1}{2}$  in. Clearance above board  $3\frac{3}{4}$  in, below board  $4\frac{1}{2}$  in. Price: £11 (plus £1 PT).

**Clearview HW12 ★**

Cabinet in teak. Takes gram unit or tape deck. Lift-off perspex lid. Overall size  $23\frac{1}{2} \times 19 \times 8\frac{1}{2}$  in. Clearance above board  $3\frac{3}{4}$  in, below board  $4\frac{1}{2}$  in. Price: £14 (plus £1.28 PT).

**Clearview HW14**

De luxe turntable or tape deck cabinet with Perspex cover. Teak or rosewood with black base. Size:  $18\frac{3}{4} \times 19\frac{1}{4} \times 9\frac{1}{2}$  in. Space above board

4in, below top of board 4½in. Fully-sprung anti-feedback base, adjustable feet for levelling, fitted with Bulgin mains socket and colour-coded phono sockets; supplied with Clearview lid stay and spirit level for fitting by user. Price: £21.75 (£1.99 PT).

**Clearview HW15LT ★**

Teak/black turntable cabinet with Perspex cover. Size: 17½ × 16¼ × 7¼in. Space above board 3¼in, below top of board 3¼in. LT version board uncut. 1LT version board cut for Garrard SP25, AT60, 3000 etc., 4LT version cut for Garrard AP75, SL75, SL95 etc. Price: £7.50 (plus 69p PT on LT or £.82 on 1LT and 4LT).

**Clearview HW15HT ★**

Teak/black turntable cabinet with Perspex cover. Size: 17½ × 16¼ × 9in. Space above board 5in, below top of board 3¼in. Cut-board versions. 1HT and 4HT, as above. Price: £8 (plus 73p PT on HT or £1.95 on 1HT and 4HT).

■ **IMHOFS**

112-116 New Oxford Street, London, WC1.  
Tel: 01-636 7878. Cables: Imcase, London, WC1.

**Type 10 ★**

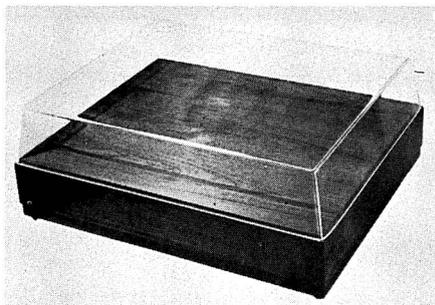
Trolley equipment cabinet. A larger version of the trolley L cabinet. A third compartment has been added to accommodate a tape recorder or to provide storage space for records. Three separate lids, each with a stay, give access to the compartments. Size: 54½in wide, 21in deep, 24in high (including 3in castors). Motor boards: left 17in wide, centre 18¾in wide, right 16in wide, all 19in deep. Finish: light or dark sapele mahogany, two-tone mahogany or walnut. Teak or Jacobean styling at slight extra cost. Price: £43.76 (plus £3.74 PT).

**HFU/12**

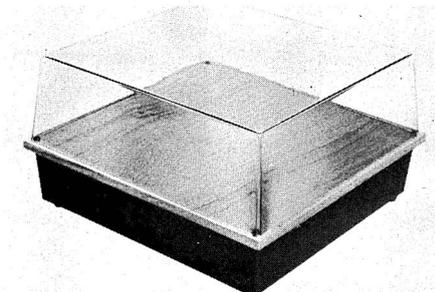
Modern sideboard style equipment cabinet with accommodation for tape deck, transcription motor, amplifier, tuner and over 250 records. Centre sliding section conceals instrument panel and two other panels give access to storage space. Centre portion of top surface hinges up to provide access to turntable or tape deck. Size: 60in wide, 22in deep, 30in high (including 6in base). Two 19 × 19in motor boards. Control panel 19in wide, 15½in high. Left-hand compartment 19in wide, 19in deep, 11in high. Right-hand compartment 19in wide, 19in deep, 18in high. Finish: teak, walnut, sapele. Price: £56.13 (plus £5.12 PT).

**HFU/12 Regency ★**

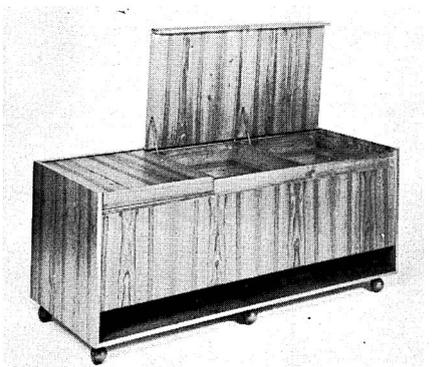
Similar to HFU/12 but in Regency styling. Size: 61in wide, 24in deep, 30in high (including 6in legs). Price: £77.70 (plus £6.80 PT).



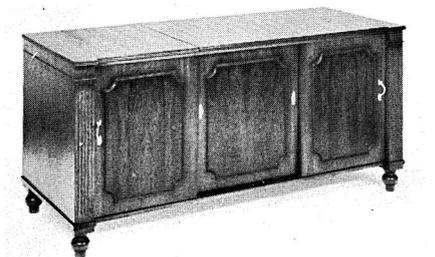
Howland-West HW12



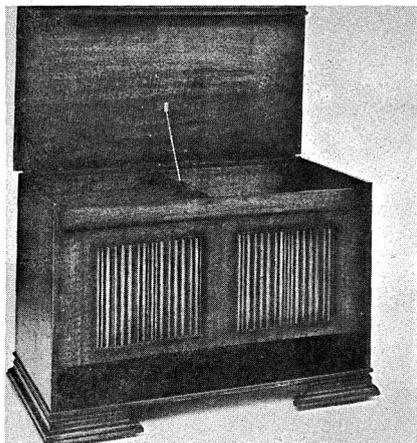
Howland-West HW15/LT



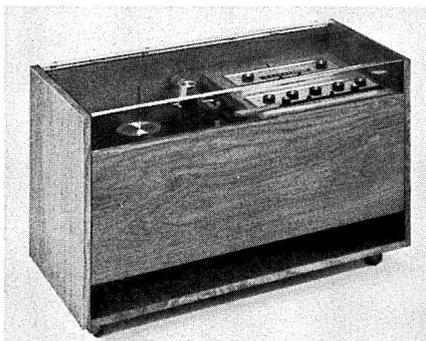
Imhofs Type 10 trolley



Imhofs HFU/12 Regency



*Imhofs Trolley L (Jacobean)*



*Imhofs Imflex Mini-trolley*



*Largs Olympic*

### **Type L**

Trolley cabinet with two compartments. Easy-running finger-tip movement. Finish: Light or dark sapele mahogany, two-tone mahogany, walnut, teak. Two lift-up lids. Size:  $35\frac{1}{2} \times 18 \times 24$ in (including castors). Compartments  $17\frac{1}{2}$ in. and  $15\frac{1}{2}$ in wide, both 16in deep. Price: £33-25 (plus £2-75 PT).

### **Type L Jacobean ★**

Similar to Type L but in Jacobean style. Size:  $36\frac{1}{2}$ in wide, 19in deep, 24in high (including 3in concealed castors). Internal sizes as trolley L. Price: £35-97 (plus £3-03 PT).

### **Imflex Mini Trolley ★**

Trolley control cabinet in contemporary styling. Lift-up Perspex lid. Designed to accept transistorised amplifier and tuner, also motor and turntable. Dimensions:  $20 \times 32 \times 15\frac{1}{2}$ in (inc. 2in castors). Motor board:  $16\frac{3}{8} \times 14\frac{1}{8}$ in. Equipment board:  $14\frac{1}{8} \times 14\frac{1}{8}$ in. Finish: teak, sapele mahogany, walnut, rosewood. Designed to enable the equipment module to be removed from the cabinet to allow ease of fitting and servicing equipment. Incorporates magazine/record storage shelf. Price: £33-56 (plus £2-44 PT).

## **■ LARGS OF HOLBORN**

76-77 High Holborn, London, WC1.

Tel: 01-242 2626 (PBX).

### **Olympic ★**

Upright cabinet with pull-out control panel in oiled teak, satin mahogany, walnut. Takes gram unit, tape deck, tuner and amplifiers. Lift-up lid with stay. Fitted with Shepherd castors. Overall size:  $40 \times 22 \times 29$ in. Particularly suitable for Quad, Leak and Ferrograph equipment. Price: £65.

### **Small Olympic**

Similar in style and appearance to Olympic but slightly smaller. Size:  $37\frac{1}{2}$ in long, 18in deep, 26in high (plus 3in castors). Finish: oiled teak, satin mahogany/walnut. Price: £55.

### **Quartette ★**

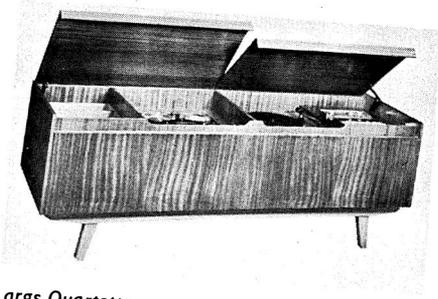
Lowline cabinet in oiled teak or mahogany/walnut satin. Two lift-up lids with tension stays. Takes gram unit, tape deck, tuner, control units and records. Size: 66in long, 18in deep, 26in high. Price: £75.

### **Large Quartette**

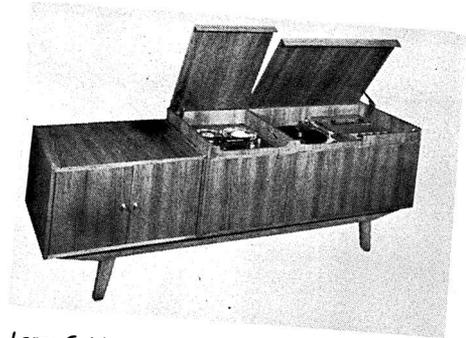
Similar in style and appearance to Quartette but especially suitable for larger equipment, i.e. Ferrograph, SME, etc. Size: 70in long, 26in high, 22in deep. Price: £85.

### **Classic**

Traditional style upright equipment cabinet with top lid for gram or tape unit and two



Largs Quartette



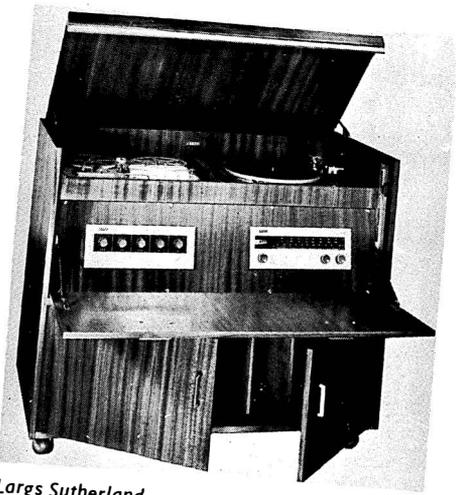
Largs Caithness



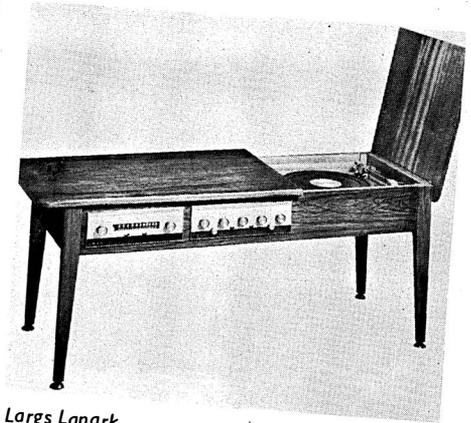
Largs Gresham



Largs Stirling



Largs Sutherland



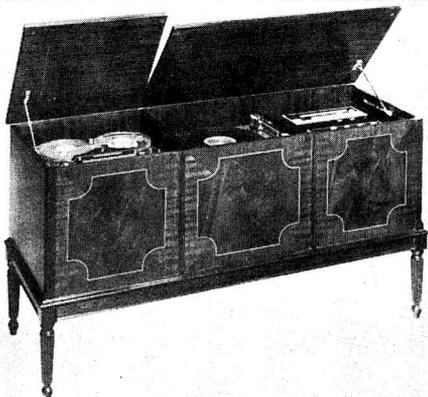
Largs Lanark



Largs Argyll



Largs Clarendon



Largs Sherborne

front opening doors giving access to front panel with record storage below. Overall size: 26in wide, 19½in deep, 39in high including plinth. Motor board 23½in wide, 16½in deep, 4in below lid. Control panel 23in wide, 9½in high. Finish: Walnut, sapele or mahogany veneer. Price: £60:

**Gresham ★**

Reproduction style cabinet in walnut or mahogany. Two front-opening doors with record storage. Lift-up lid. Space for tuner, control unit and turntable. Size: 40in long, 20½in deep, 33½in high including legs. Price: £120.

**Caithness ★**

Modern lowline cabinet made in three sections: main equipment cabinet, record and tape storage cabinet, plinth. Main cabinet will accommodate tuner, control unit, turntable and tape deck. Two lift-up lids. Storage cabinet has fixed top and being slightly lower than main cabinet provides ideal setting for ornament or flowers. Size: 78in long, 22in deep, 26in high including 9in plinth. Price: £115.

**Sutherland ★**

Designed to take large amount of big equipment together with comprehensive record library. Lift-up lid with two stays covers space for turntable and tape deck, drop-down front conceals panel for tuner and control unit. Two front-opening doors at bottom give access to record storage. Size: 40in long, 21½in deep, 35in high. Finish: oiled teak or satin mahogany/walnut. Price: £95.

**Stirling ★**

Compact-looking modern cabinet with room for tuner, control unit, turntable and smaller types of tape unit, also space for record storage. Lift-up lid with two stays and sliding doors at front. Size: 40in long, 20in deep, 27in high including 3in castors. Finish: oiled teak or satin mahogany/walnut. Price: £75.

**Trio ★**

Two lift-up lids cover three compartments, the third compartment being fitted for tape deck or record storage whilst first two accommodate turntable, tuner and control unit. Modern clean style cabinet finished in oiled teak, or satin mahogany/walnut. Size: 48in long, 18in deep, 26in high including 9in legs. Price: £58.

**Large Trio**

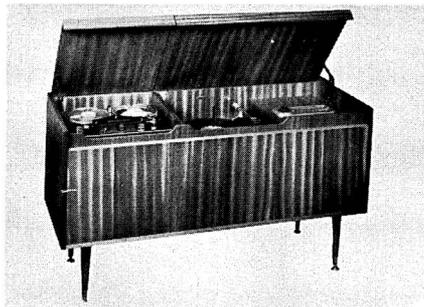
Similar in style and appearance to Trio but designed for larger equipment, i.e. Ferrograph, SME, etc. Size: 54in long, 22in deep, 26in high including 9in legs. Price: £63.

**Lanark ★**

Coffee table with lift-up lid concealing compartment for record unit. Accommodation for tran-



Largs Beaumont



Largs Trio

sistor tuner and amplifier. Specially designed for Leak equipment. Size: 54in long, 19½in deep, 22½in high. Price: £48.

#### Argyll ★

Miniature cabinet designed for transistor equipment. Right-hand section will accept all but the largest turntables. Removable transparent plastic dust cover. Left-hand section accommodates tuner and integrated amplifier. Open storage space for records. Size: 33½in long, 16½in deep, 11½in high plus 14in legs. Price: £45.

#### Clarendon ★

Elegant reproduction cabinet with accommodation for record unit, tape deck, tuner, amplifier and record storage. Single lift-up lid. Two front-opening doors. Size (overall): 38in wide, 36½in high (including 9½in legs), 19in deep. Motor and tape deck board: 36½in wide, 16in deep, 4in clearance below lid. Control panel: 17in wide, 15in high. Record storage: 18in wide, 15in high. Price: £125.

#### Beaumont ★

Traditional style with the same facilities as the

Olympic. Overall dimensions: 31 × 40 × 21½in. Motor board: 36 × 18½in, drop 4in. Control panel: 37¼ × 5in, drop 1¾in. Price: £130.

#### Beaumont storage cabinet

Overall measurements: 31 × 23½ × 17in. Storage compartments: 13½in high × 19½in long, 9in high × 21in long. Price: £45.

#### Sherborne ★

Period style cabinet with richly figured mahogany veneer finish. Will accommodate gram motor, radio and amplifier control unit, plus tape deck or gramophone record storage. Two lift-up lids. Overall measurements: 51½in long, 17in high (plus 12in legs), 18½in deep. Tape board: 16½in wide, 16½in deep, 7½in drop. Motor board: 17½in wide, 16½in deep, 4in drop. Control panel: 14in wide, 14½in deep, 2½in drop. Piano-type hinges on lids. Fitted two brass-nylon lid stays. Price: £100.

The high-fidelity equipment cabinets listed and illustrated represent only a small selection of Largs' tailor-made products. Largs operates its own cabinet factory and invites enquiries for cabinets to customers' own specifications.

Prices quoted include delivery within 20 miles of High Holborn.

### ■ EDWARD MICHELSEN CUSTOM CABINETS

153 Plumstead Road, London, SE18.

Tel: 01-854 2369.

#### Lowline Major

Designed to take the majority of modern equipment. Can be custom built to suit customer's requirements. Standard size: 41 × 17 × 8in (plus legs and Perspex lid). Finish: teak or mahogany. Price: (ready made) £15-75; (in kit form) £12-60.

#### Split-level cabinet

Designed to take modular amplifiers and tuners, with fixed position for turntable. Turntable on upper level covered with clear plastic top. Amplifier or tuner/amplifier sited below. Another lower level available for separate tuner and amplifier set-up. Record storage section alongside. Space for approximately 100 LPs. Clear plastic sliding doors. Cabinet finish: teak, mahogany or pine veneer. Available with wooden lid. Two sizes: (transcription) 36 × 16 × 20in with 6in legs; (auto-changer) 34 × 15 × 20in with 6in legs. Prices: (transcription) £20-50; (auto-changer) £19-50.

A comprehensive range of plinths to suit all motor units is available. Prices: (ready built) from £6-85 to £8-95; (in kit form) from £5-80 to £7-90.

Cabinets built to customer's specification at

★ Indicates entry is illustrated

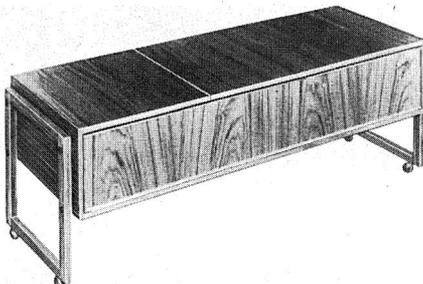
competitive prices. Wide range of woodworking and finishing materials stocked for the do-it-yourself cabinet maker. Full details on request.

### ■ PAGEENTRY RADIO & TV CO LTD

104 Felsham Road, Putney, SW15.

Tel: 01-788 5588.

Hand made cabinets to house hi-fi systems and speaker units designed and built to customers' specific requirements. Some standard models normally available from stock. Full details on request.



*Record Housing Cantilena*

### ■ RECORD HOUSING

Brook Road, Wood Green, London, N22.

Tel: 01-888 7487.

#### **Lowflex**

Lowline cabinet in teak. Takes gram unit, tape deck, tuner, amplifier, etc. Lift-up lids, one with pneumatic stay. Overall size: 59 × 21 × 14in (plus 9in for legs). Record storage on left. Partition removable if not required. Price: £55.

#### **Britten**

Upright style equipment cabinet with record storage. One lift-up lid. Accommodation for gram unit (or tape deck), tuner and amplifier plus 150 records. Size: 20in wide, 49½in deep, 36in high. Finish: teak, walnut or mahogany. Price: £37-80.

#### **Cantelina ★**

Lowline cabinet, teak leg frame fitted with black and chrome castors. One lid and one drop-down flap. Accommodation for turntable, amplifier and tuner. Dimensions: 22½ × 50½ × 17in; turntable section 18in wide × 15½in deep; amplifier section 28½ × 7½ × 14½in. Finish: teak. Price: £36.

#### **Playview Junior**

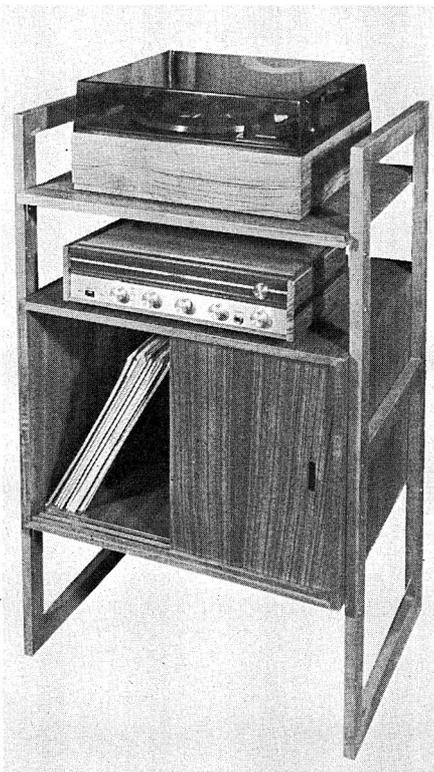
Shelf unit to house Garrard SP25, AP75 or other similar size motor units. Size 8in high, 16½in wide, 14in deep. Finish: teak. Mounting board 15½in wide, 13in deep. Clear plastic lid which will hinge back or can be lifted off. Cruciform stand optional extra. Price £8-95.

#### **Playview Senior**

Shelf unit to accommodate large turntables such as Garrard 301, 401, Goldring/Lenco, etc. Mounting board 17½in wide, 17½in deep. Finish: teak. Clear plastic lid which will hinge back or can be lifted off. Size: 8in high, 18½in wide, 18½in deep. Price: £11-95.

#### **Scan Plan ★**

Shelving and cabinet system for housing audio separates and records in a small place and at an economical cost. Has space for motor turntable



*Record Housing Scan Plan*

unit plus amplifier or tuner/amplifier. Compartment beneath will hold 150 records. Sliding doors. System adjustable to suit requirements and can be extended by adding further units alongside. Size: 36in high, 20in wide, 16½in deep. Price: £22-45.

#### Hi-Flex/Shelfframe system

Will accommodate shelf mounting motor and pick up, tape recorder, radio tuner and amplifier, plus 250 records in cabinet below. Sliding doors. Size: 33in wide, 36in high, 16½in deep. Price: £32-20.

#### Recaudio record/equipment cabinet

Adjustable cabinet and shelf system that will accommodate player unit, tape recorder, tuner and amplifier, plus 100 records. Cabinet mounted on castors. Two centre-opening full-length doors. Complete with two internal shelves and six removable record partitions. Keeps equipment free from dust (and safe from busy little fingers). Finish: teak. Size: 18in wide, 17in deep, 32in high (including castors). Price: £25.

#### Audio Trolley ★

Provides neat housing for tuner, amplifier, record deck and tape recorder, plus storage space for 150 records. Open front and back. Mounted on easy-run castors. Centre compartment measures 14in wide, 14in high and 17in deep. Overall size: 36in wide, 22in high and 17in deep. Finish: medium walnut or natural afromosia. Trolley is polished all round. Price: £21-50.

#### ■ SME LTD

Steyning, Sussex, BN4 3LN. Tel: Steyning 2228.

#### Model 2000 ★

Plinth system with one motor-board ready cut for SME pickup arm and turntable. The one-piece acrylic lid has a stainless steel reinforcing trim. Counter-spring hinges retain the lid open when required. Dimensions: 9 × 24 × 20in. Price: £34-45 (plus £8-42 PT) in teak, walnut or rosewood.

All parts of Model 2000 are available separately. These comprise the base, motorboard, acrylic lid, spring mounts (set of four), and left- or right-hand hinge (see constructional kits section).

#### ■ STAPLES & CO LTD

Staples Corner, Junction Edgware Road and North Circular Road, London, NW2.  
Tel: 01-452 1144/7.

#### Ladderax ★

Unit system hi-fi cabinet designed to fit Staples Ladderax assembly. Lift-up main lid giving access to space for tuner, control unit and record



Record Housing Audio Trolley



S.M.E. 2000 Plinth



Staples Ladderax Hi-Fi

★ Indicates entry is illustrated

or tape deck. Front panel removable to facilitate installation. Will accept most modern equipment. Size: 35in wide, 17in deep, 18½in high. Motorboard: 33½ × 16 × ½in, height above 5½in. Finish: teak or rosewood veneer. Full details of other matching units on request. Prices from about £41.

#### ■ STENTORIAN

Whiteley Electrical Radio Co. Ltd, Victoria Street, Mansfield, Notts.  
Tel: Mansfield 24762.

#### C16 Thoresby Equipment Console

Upright style equipment cabinet with lift-up lid. Takes most makes of gram unit or tape deck, amplifier, control unit and tuner. Available in mahogany or walnut. Supplied packed flat and easily assembled in a few minutes with a screwdriver only. Size: 19½ × 18 × 31in. Price: (C16 mahogany) £28.26 (plus £2.80 PT); (C16A walnut) £29.20 (plus £2.90 PT).

#### ■ TYSONS

41 Russell Street, Leamington Spa.  
Tel: Leamington Spa 24935.

#### Tysonic Dower Chest.

Lowline style in oak. Suitable for gram unit, tape deck, tuner, amplifier. Lift-up lid. Generally 36in to 48in long. Price: £40 to £55.

Equipment installed in antique or reproduction furniture to customers' requirements. Dower chests a speciality.

#### ■ VERO

Vero Electronics Ltd, Industrial Estate, Chandler's Ford, Eastleigh, Hants, SO5 3ZR.  
Tel: Chandler's Ford 2952. Telex: 47551.

Wide range of equipment cases suitable for hi-fi units, tuners, power supplies and test gear. Available in various panel heights and with or without anodised aluminium front handles. Made in light gauge steel finished in RAF blue/grey vinyl paint. Integral aluminium trim. Neat slim-line appearance. Ventilation slots incorporated. Full list of sizes, accessories and prices available on request. Ask for catalogue of Vero 'D' series cases.

■ WHITELEY ELECTRICAL See Stentorian.



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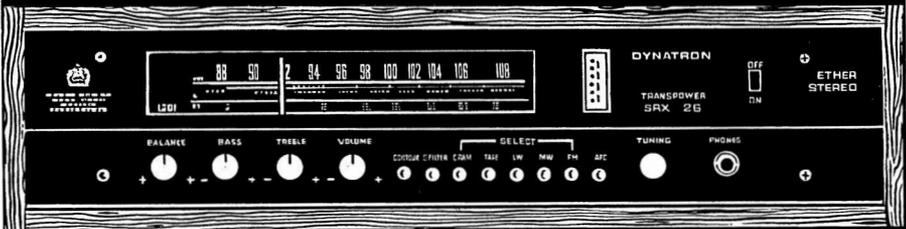
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# Complete Audio Systems

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

In this section manufacturers give details of audio systems marketed as complete packages or made up from individual units. Brief specifications only are quoted since many of the units listed are fully covered in the earlier sections of the book.

This list is not comprehensive and other makers who offer similar equipment are invited to submit details for inclusion in future editions of the book.

In order that a wide choice of systems can be shown the equipment in this special section ranges from medium priced unit audio up to top quality high fidelity. But in every case the following minimum requirements are met:

- 1 Fully stereophonic record reproduction and/or tape playback.
- 2 FM or AM/FM radio tuner.
- 3 Record turntable or tape deck (or both).
- 4 Matched units (electronically and aesthetically).
- 5 Marketed as a complete system by one manufacturer.
- 6 Ready for use by purchaser without fitting parts or wiring up (apart from plugging in mains supply and connecting speakers).
- 7 Speakers in separate acoustic enclosures.

## ■ ALPHA

Highgate Acoustics Ltd, 184-188 Great Portland Street, London, W1.  
Tel: 01-636 2901.

### Alpha Combination Unit

Stereo tuner/amplifier in cabinet with record deck. Range: 88-108MHz, 187-572 metres. Variable tuning. Stereo decoder fitted. Controls: volume, balance, bass, treble, input selector, tuning. Output: 5W RMS per channel. FR:

50Hz-15kHz + 2dB. Output impedance: 8 ohms. HD: 0.6% at 5W. Motor unit: Garrard SP25 Mk III. Cartridge: Orbit NM22 magnetic. Speakers: 6½in and 2½in dual-cone per channel. Finish: teak. Price: £81-30½ (plus £17-69½ PT).

### Alpha MR15

Stereo tuner/amplifier in cabinet with record deck. Range: 88-108MHz, 187-572 metres. Variable tuning. AFC. Stereo decoder fitted. Controls: (slider) bass, (slider) treble, speaker selector, volume, balance, tuning, input selector, on-off, AFC, high pass filter, loudness, stereo/mono, tape monitor. Output: 18W RMS per channel. FR: 20Hz-35kHz. Output impedance: 8 ohms. HD: 0.5% at 15W. Motor unit: Lenco 75. Magnetic cartridge. Size: 18½ × 18 × 5½in. Speakers: Alpha HT20 Mk II with three units in each. Finish: walnut. Price: (complete system with two speakers) £171-08 (plus £25-92 PT).

## ■ AVERINE ELECTRONICS

PO Box No. 6, Ruislip, Middlesex, HA48AT.

### STTA60

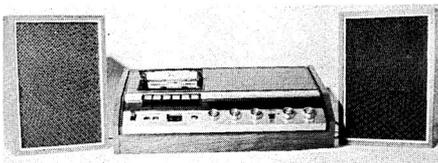
Tuner/amplifier with record deck and two speakers. Range: 88-108MHz. Variable tuning. AFC. Stereo decoder fitted. Controls: volume on-off, tuning, mono/stereo, balance, input selector, bass, treble, low-pass filter, AFC on-off, inter-station muting, decoder mono. Output: 30W RMS per channel. FR: 20Hz-20kHz ± 1dB. Output impedance: 8 ohms. HD: < 0.1% at all levels. Motor unit: Thorens TD150 and arm. Cartridge: Goldring 800 Super E. Speakers: Averine L60. Size: (main unit) 15¼ × 13½ × 6½in. Price: to be announced.

## ■ BIGSTON

J. Parkar & Co. (London) Ltd,  
Parkar House, 1 Paul Street, London, EC2.  
Tel: 01-628 4577.

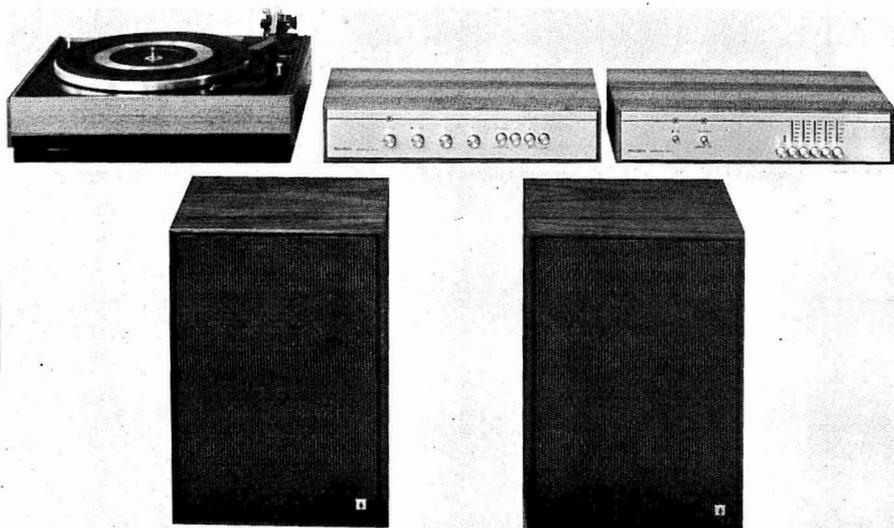
### BHS-100 ★

Stereo tuner/amplifier with cassette record deck and two separate speakers. Range: FM 88-108MHz, MW 187-750 metres. Variable tuning with AFC. Stereo decoder fitted. Controls: tuning, input selector, tone, right-channel volume, left-channel volume, mains on-off, monitor on-off, pushbutton tape recorder controls.

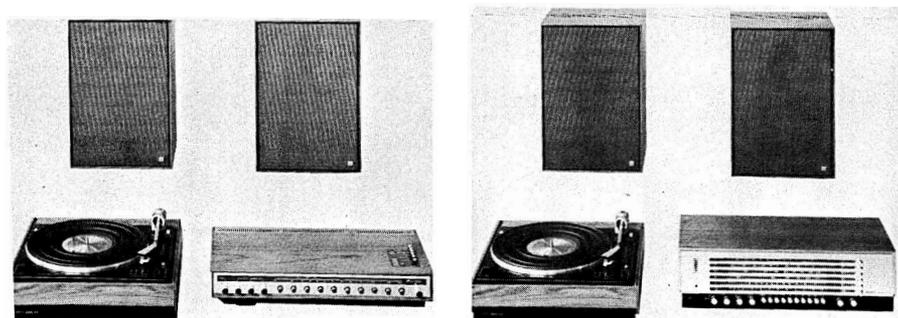


Bigston BHS-100

★ Indicates entry is illustrated



*Bush-Arena System 2*



*Bush-Arena System 3*

*Bush-Arena System 5*



*Bush-Arena System 4*

Output: 3W RMS per channel. FR: 80Hz-10k Hz. Output impedance: 8 ohms. Electronically controlled tape transport motor. 26 transistors, 14 diodes.  $\frac{1}{4}$ -track compact cassette deck. 5in high compliance speakers in infinite baffle cabinets. Jack sockets for two microphones (left and right channel). Outlet for stereo phones. Size: (main unit)  $10\frac{3}{8} \times 7\frac{1}{2} \times 5\frac{1}{2}$ in. Wood veneered cabinets. Price: £99 (inc. PT).

### ■ BUSH-ARENA

Rank Bush Murphy Ltd, Power Road, Chiswick, London, W4. Tel: 01-994 6491.

#### Bush-Arena System 2 ★

Stereo tuner and amplifier with record deck and speakers. Range: FM 87-108MHz. 31-transistor circuit. Switched preset tuning. AFC. Stereo decoder fitted. Controls: volume on-off, treble, bass, balance, mono-stereo, pushbutton input selector, stereo decoder switch, tuning buttons. Output: 10W RMS per channel. FR: 25Hz-20kHz - 3dB. Output impedance: 4 ohms. HD: <1% at rated output. Motor unit: Garrard SP25 Mk III. Cartridge: Goldring G800 magnetic. Speakers: three units (6 $\frac{1}{2}$ in bass driver, 2 $\frac{1}{2}$ in mid-range unit, 2 $\frac{1}{2}$ in tweeter). Crossover: 3kHz, 5kHz. Finish: teak veneer. Size: (radio tuner)  $13\frac{3}{4} \times 3 \times 7\frac{3}{8}$ in; (amplifier)  $13\frac{3}{4} \times 3 \times 7\frac{3}{8}$ in; (record unit)  $14\frac{1}{4} \times 6 \times 12\frac{1}{2}$ in; (speaker units)  $14 \times 9\frac{5}{8} \times 7\frac{3}{8}$ in. Price: (complete system) £122-33 (plus £13-67 PT).

#### Bush-Arena System 3 ★

Stereo tuner/amplifier with record unit and speakers. Range: FM 87-108MHz. 36-transistor circuit. Variable and preset switched tuning. AFC. Stereo decoder fitted. Controls: volume on-off, treble, bass, balance, loudness, rumble filter, mono/stereo switch, input selector, speaker selector, tuning buttons. Output: 15W RMS per channel. FR: 25Hz-20kHz - 3dB. Output impedance: 3-2 ohms. HD: <0.6%. Motor unit: Garrard AP76. Cartridge: Goldring G800E magnetic. Speakers: three units (8in bass driver, 2 $\frac{1}{2}$ in midrange unit, 2 $\frac{1}{2}$ in tweeter). Crossover: 3kHz, 5kHz. Finish: teak or rosewood veneer, or white. Size: (tuner/amplifier)  $19\frac{1}{2} \times 3\frac{1}{4} \times 9\frac{3}{8}$ in; (record deck)  $15\frac{1}{4} \times 15\frac{1}{8} \times 6\frac{1}{2}$ in; (speakers)  $17 \times 11 \times 9\frac{1}{2}$ in. Price: (complete system) £157-47 (plus £27-53 PT).

#### Bush-Arena System 4 ★

Stereo tuner/amplifier in cabinet with record deck plus two separate speakers. Range: FM 87-108MHz. 40-transistor circuit. Switched preset tuning. AFC. Stereo decoder fitted. Controls: volume on-off, treble, bass, balance, loudness, input selector, mono/stereo switch, tuning buttons. Output: 15W per channel RMS. FR: 25Hz-20kHz - 3dB. HD: <0.6%. Motor unit: Lenco B55. Cartridge: Goldring G800E mag-



#### Deptford Hi-Fi Design Centre System

netic. Speakers: three units (8in bass driver, 2 $\frac{1}{2}$ in mid-range unit, 2 $\frac{1}{2}$ in tweeter). Crossover: 3kHz, 5kHz. Finish: teak veneer. Size: (main unit)  $22\frac{3}{4} \times 12\frac{3}{4} \times 6\frac{3}{8}$ in; (speakers)  $17 \times 11 \times 9\frac{1}{2}$ in. Price: (complete system) £157-47 (plus £27-53 PT).

#### Bush-Arena System 5 ★

Five-waveband stereo tuner/amplifier with record deck and speakers. 38-transistor circuit. Range: FM 87-108MHz, MW 182-583 metres, LW 833-2000 metres, SW1 49 metre band, SW2 68.2-187 metres. Variable and preset switched tuning. AFC. Stereo decoder fitted. Controls: volume on-off, treble, bass, balance, loudness, speaker selector, input selector, tuning. Output: 15W RMS per channel. FR: 25Hz-20kHz - 3dB. HD: <0.6%. Motor unit: Garrard AP76. Cartridge: Goldring G800E magnetic. Speakers: three units (8in bass driver, 2 $\frac{1}{2}$ in mid-range unit, 2 $\frac{1}{2}$ in tweeter). Crossover: 3kHz, 5kHz. Finish: teak veneer. Size: (tuner/amplifier)  $19\frac{1}{2} \times 5\frac{1}{2} \times 9$ in; (record deck)  $6\frac{3}{8} \times 15\frac{1}{4} \times 15\frac{1}{8}$ in; (speaker units)  $16\frac{7}{8} \times 11 \times 9\frac{1}{2}$ in. Price: (complete system) £163-08 (plus £28-92 PT).

### ■ CROWN RADIO CO LTD

128/129 Shoreditch High Street, London, E1 6JE. Tel: 10-739 2382.

#### SHC51, FM500, CSP7 (2)

Transistorised. Range: 87-108MHz, 187-570m. AFC. Multiplex decoder fitted. Includes cassette recorder. Controls: bass, treble, balance, selector, record level, playback volume, push-buttons for on-off, record meter, tape play and speaker. Output: 15W RMS per channel. Response: 30Hz-20kHz. Output impedance: 8 ohms. Dimensions: (radio tuner)  $5 \times 15\frac{1}{2} \times 10\frac{1}{2}$ in; (amplifier and recorder)  $5 \times 15\frac{1}{2} \times 10\frac{1}{2}$ in. Speakers: two CSP7. Finish: oiled walnut. Price: (complete system) £154-78 (plus £38-22 PT).

### ■ DEPTFORD CAMERAS & HI-FI DESIGN CENTRE LTD

494 New Cross Road, London, SE14. Tel: 01-692 2981.

★ Indicates entry is illustrated

### Complete system ★

Comprises integrated stereo amplifier, stereo FM tuner and record deck in shelf-mounting cabinet with two separate speaker enclosures. System based on the Sinclair Project 60 amplifier and tuner. Range: FM 87.5-108MHz. Variable tuning. AFC. Decoder fitted. Stereo tuning indicator. Controls: pushbutton input selectors, bass  $\pm 15$ dB at 100Hz, treble  $\pm 15$ dB at 10kHz, volume, balance, rumble filter 12dB/octave 25-100Hz, scratch filter 12dB/octave 5-28kHz, tuning. Output: 30W RMS per channel into 8 ohms. FR: 30Hz-300kHz  $\pm 1$ dB. HD: 0.02% into 8 ohms. Output impedance: 3-8 ohms. Motor unit: Thorens TD150 Mk II. Cartridge: Shure M55E. Speakers: Thurston RS-10 column speakers. Price: (complete system) £181.61 (inc. PT).

### ■ DUAL ELECTRONICS LTD

St Georgen House, Mill Road, Stokenchurch, High Wycombe, Bucks.  
Tel: Radnage 3467/8.

#### KA50 Music Centre

Comprises CR50 tuner/amplifier, 1218 turntable, Shure M75 cartridge and two separate CL170 speaker enclosures. Equipment is housed in special base with dust cover for record deck. Range: LW, MW, SW1, SW2, VHF. Stereo decoder fitted. Stereo beacon, with auto switching. Variable tuning plus five preset FM stations. Output: 18W RMS per channel into 4 ohms. Inputs: magnetic PU, ceramic PU, tape. FR: 20Hz-40kHz  $\pm 0.6$ dB. HD:  $< 0.3\%$  at 1kHz at 18W. Three-speed record deck with lightweight tubular pickup arm. Fine speed adjustment. 10 $\frac{1}{2}$ in 4 $\frac{1}{2}$ lb turntable. Two matching speaker enclosures each fitted with three units. Price and full details upon application.

### ■ DYNATRON RADIO LTD

St Peters Road, Furze Platt, Maidenhead, Berks. Tel: Maidenhead 23331.

#### Cavalcade HFC31A system

Integrated stereo tuner/amplifier with record deck in cabinet plus matching speakers. Range FM 87-108MHz, MW 185-570 metres, LW 1100-2000 metres. Variable tuning. AFC incorporated. Stereo decoder fitted. Output: 8W RMS per channel. HD:  $< 1\%$  at rated output. FR: 40Hz-16kHz  $\pm 3$ dB. Output impedance: 4 ohms for speakers, 8 ohms or greater for phones. Controls: bass, treble, balance, volume, loudness, input selector, tuning, filter, AFC on-off. Motor unit: Garrard 2025TC. Cartridge: Sonotone 9TAHC. Size: 19  $\times$  16 $\frac{1}{2}$   $\times$  9 $\frac{3}{8}$ in. Finish: teak. Suggested speakers: LS1734 (other

types available). Price: (complete system including two speakers) £142 (inc. PT).

#### HFC31MT

Integrated stereo tuner/amplifier with record deck in cabinet plus matching speakers. Similar specification to HFC31A but with Garrard SP25S Mk III record deck and Goldring G850 cartridge. Suggested speakers: LS2034 (other types available). Size: (main unit) 19  $\times$  16 $\frac{1}{2}$   $\times$  9 $\frac{3}{8}$ in. Price: (complete system with two suggested speakers) £256 (inc. PT).

#### Cavalcade HFC32 system

Integrated stereo tuner/amplifier with record deck in cabinet plus matching speakers. Similar specification to HFC31A but with single-play transcription record unit. Record deck: Goldring-Lenco GL75. Cartridge: Goldring G800. Suggested speakers: LS2034 (other types available). Price: (complete system inc. two speakers) £178.

#### HFC91 system ★

Integrated stereo tuner/amplifier with record deck in cabinet plus two separate speakers. Range: FM (manual tuning) 87-101MHz, (preset tuning) 87.5-108MHz; MW 185-570 metres; LW 1100-2000 metres. Stereo decoder incorporated. AFC. Controls: main on-off, high filter, low filter, balance, volume, bass, treble, loudness contour, tape monitor, stereo/mono, channel reverse, speaker switching (A, A + B, B), tuning, four preset programme buttons, input selector buttons. Output: 45W RMS per channel into 3 ohms. FR: 30Hz-20kHz  $\pm 1$ dB. Output impedance: 3-16 ohms. HD: 0.2% at 0.5dB below rated output into 4-16 ohm load. Motor unit: Goldring-Lenco P75. Cartridge: G800. Finish: teak veneer. Suggested speakers: LS4038 (other types available). Size: (main unit) 19 $\frac{1}{2}$   $\times$  16 $\frac{1}{2}$   $\times$  5 $\frac{1}{2}$ in. Price: (complete system with two suggested speakers) £299 (including PT).

#### STA90 system

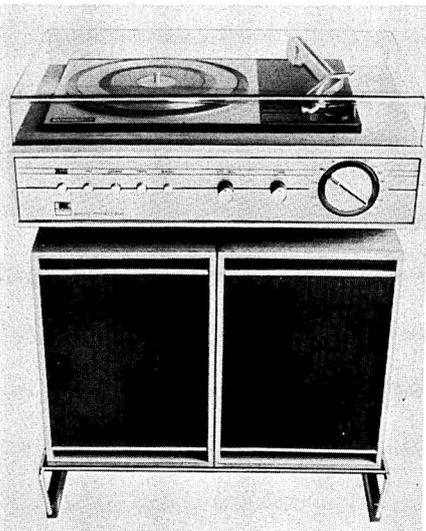
Integrated stereo tuner amplifier, record deck in separate cabinet, two matching speakers. Range: FM: (manual) 87-101MHz, (preset) 87.5-108MHz; MW 185-570 metres; LW 1100-2000 metres. AFC incorporated. Stereo decoder fitted. Controls: mains on-off, high filter, low filter, balance, volume, bass, treble, loudness contour, tape monitor, stereo/mono, channel reverse, speaker switching (A, A + B, B), tuning, four preset programme buttons, input selector buttons. Output: 45W per channel into 3 ohms. FR: 30Hz-20kHz  $\pm 1$ dB. HD: 0.2% at 0.5dB below rated output into 4-16 ohm load. Output impedance: 4-16 ohms. Dynatron P100 motor unit comprising Goldring-Lenco motor and G800 cartridge in teak cabinet. Suggested speakers: LS4038 (other types available). Size: (main unit) 19 $\frac{1}{2}$   $\times$  16 $\frac{1}{2}$   $\times$  5 $\frac{1}{2}$ in. Price: (complete



Dynatron HFC91



Ekco Sound Project ZU5



Ekco Sound Project ZU6

system comprising tuner/amplifier, record unit and two suggested speakers) £308 (inc. PT).

#### ■ EKCO

Pye Ltd, PO Box 49, St Andrews Road, Cambridge. Tel: Cambridge 58985

#### Sound Project ZU5 ★

Three-unit transistorised stereo unit. Radio coverage: 86.5-101MHz. Pushbutton varicap diode tuning with AFC. Stereo decoder fitted. Controls: volume, balance, bass, treble, on/off, input selector buttons, four radio programme buttons. Output: 17W RMS per channel. FR 40Hz-16kHz  $\pm 1.5$ dB (tone controls level). Output impedance: 4 ohms. HD: 1% at rated output. Motor unit: Philips GC017. Cartridge: Philips GP410. Size: 19 $\frac{7}{8}$ in wide, 6 $\frac{1}{2}$ in high, 13 $\frac{3}{4}$ in deep. Speakers: two LSE10/4 enclosures each having 8in drive unit and 3in tweeter. Finish: teak veneers. Price: (complete system) £133.57 (plus £31.43 PT).

#### Sound Project ZU6 ★

Three-unit transistorised stereo unit on stand. Radio coverage: 87.5-100MHz. Rotary tuning by varicap diodes. AFC. Stereo decoder optional extra. Controls: pushbutton input selector and on-off, two-position bass control, dual volume and balance control, treble, tuning. Output: 3W RMS per channel. FR 50Hz-20kHz. Output impedance: 4 ohms. Motor unit: Philips GC032. Cartridge: Philips AU1030. Size: (main unit) 15in wide, 6 $\frac{3}{4}$ in high, 11in deep. Speakers: two LSE4 enclosures, each with 6 $\times$ 4in unit. Finish: teak veneers. Price: (complete system less stand) £60.71 (plus £14.29 PT); (stand £4.41 plus 39p PT).

#### SRG609 ★

Three-unit transistorised stereo unit. Radio coverage: 87-108MHz, 185-572 metres, 1200-2000 metres. Variable tuning. Stereo decoder optional extra. Controls: pushbutton wavebands and function selector, on/off/treble, bass, volume, tuning. Output: 4W RMS per channel. Output impedance: 12 ohms. Motor unit: BSR MA65. Cartridge SC5M. Size: (main unit) 23 $\frac{1}{2}$ in wide, 9 $\frac{1}{2}$ in high, 14 $\frac{1}{2}$ in deep. Speakers: two matching 8 $\times$ 5in units in separate enclosures. Finish: teak veneer. Price: (complete system less stand) £71.65 (plus £16.85 PT); stand £4.05 (plus 95p PT).

#### ■ ELIZABETHAN

Lee Products (GB) Ltd, 10-18 Clifton Street, London, EC2. Tel: 01-247 1846.

#### Windermere Suite

Combined stereo amplifier and playing desk in teak veneered cabinet, with mono FM tuner in



Ekco SRG 609



Fidelity UA1

matching cabinet. Range: 88-108MHz. Variable tuning. AFC with  $\pm 250\text{kHz}$  pull-in. No decoder. Sensitivity:  $14\mu\text{V}$ . Audio output:  $100\text{mV}$  to amplifier input. Controls: bass  $+11\text{dB} - 18\text{dB}$  at  $60\text{Hz}$ , treble  $+11\text{dB} - 19\text{dB}$  at  $16\text{kHz}$ . Output:  $4\text{W RMS}$  per channel. Output impedance:  $12\text{ ohms}$ . Headphone socket (low impedance). Inputs: tape recorder  $100\text{mV } 200/300\text{K}$ , tuner  $100\text{mV } 200/300\text{K}$ . Signal-to-noise:  $-55\text{dB}$  (referred to maximum output at  $1\text{kHz}$  with all controls to maximum, balance to centre). Speakers:  $8 \times 5\text{in}$  full-range drivers. HC:  $5\text{W RMS}$ .  $12\text{ ohms}$  impedance. Record unit: Garrard 2025TC. Sizes: (main amplifier and record deck unit)  $24\frac{3}{8} \times 14\frac{3}{8} \times 8\frac{1}{2}\text{in}$ ; (FM tuner)  $13\frac{3}{8} \times 3\frac{3}{8} \times 7\frac{1}{4}\text{in}$ ; (speakers)  $12 \times 9 \times 6\text{in}$ . Price: (complete system)  $\pounds 55.86$  (plus  $\pounds 13.14$  PT).

## ■ FALCON

John Street (Manufacturers) Ltd,  
Falcon Works, Barmeston Road, Catford,  
London, SE6. Tel: 01-698 1177.

### JS-TR2

Stereo tuner/amplifier with record deck and two separate speaker enclosures. Range: FM, MW, SW and LW. Variable tuning. Sensitivity: FM better than  $5\mu\text{V}$ . Controls: bass  $\pm 12\text{dB}$  at  $40\text{Hz}$ , treble  $\pm 10\text{dB}$  at  $15\text{kHz}$ , volume, tuning, balance, input selector, mains on-off. Output:  $6\text{W RMS}$  per channel. FR:  $30\text{Hz}-20\text{kHz} \pm 3\text{dB}$ . HD:  $< 1\%$  at all outputs. BSR four-speed record deck. 17 transistors, four diodes. Speaker units:  $6\frac{1}{2}\text{in}$   $8\text{ ohms}$ . PU input:  $100\text{mV}$ . DIN input and output sockets. Provision for tape record and playback. Price:  $\pounds 89$  (inc. PT).

## ■ FANTAVOX

Distributors: Lasky's Radio Ltd,  
3-15 Cavell Street, Tower Hamlets, London,  
E12BN. Tel: 01-790 4821.

### SR-640

Tuner/amplifier with record deck mounted on top, plus two matched bookshelf speakers. Range: FM 88-108MHz, AM 187-560m. Sensitivity: FM  $10\mu\text{V}$  for  $500\text{mW}$ , AM  $300\mu\text{V}$  for  $500\text{mW}$ . SN: FM  $50\text{dB}$ , AM  $35\text{dB}$ . Output:  $5\text{W RMS}$  per channel. FR:  $50\text{Hz}-15\text{kHz}$ . Inputs: mag PU  $5\text{mV}$ , ceramic pickup  $40\text{mV}$ , aux  $200\text{mV}$ . Bass control:  $\pm 10\text{dB}$  at  $50\text{Hz}$ . Treble control:  $\pm 10\text{dB}$  at  $10\text{kHz}$ . Output impedance:  $8\text{ ohms}$ . Mains:  $230-240\text{V } 50\text{Hz}$ . Consumption:  $40\text{VA}$ . Motor unit: BSR autochanger. Speakers: Two AS-57 bookshelf type. Price: (complete system)  $\pounds 44$ .

## ■ FIDELITY RADIO LTD

6 Olaf Street, London, W11. Tel: 01-727 0131.

### Unit Audio One ★

Stereo tuner/amplifier and record deck with two matched speakers. 20 transistors, one integrated circuit, 7 diodes. Range: FM 87.5-108.2MHz, MW 185-555m, LW 1200-2000m. Variable tuning, separate scales and pointers for AM and FM. Multiplex decoder fitted. Stereo beacon. Switchable AFC. Controls: (pushbuttons) gram, LW, MW, FM, auxiliary, AFC; (rotary controls) bass  $+16\text{dB} - 13\text{dB}$  at  $70\text{Hz}$ , treble  $+12\text{dB} - 14\text{dB}$  at  $14\text{kHz}$ , volume  $+8\text{dB}$  at  $100\text{Hz}$  at  $30\text{dB}$  down from maximum volume. Output:  $6\text{W RMS}$  per channel into  $8\text{ ohms}$ . HD:  $< 1.5\%$  at rated output. FR:  $55\text{Hz}-23\text{kHz} \pm 1.5\text{dB}$  at  $1\text{W}$  with tone controls flat. Motor unit: Garrard SP25 Mk III. Cartridge: Acos GP104 ceramic. Speakers:  $10\text{in}$  bass driver and  $4\text{in}$  treble unit in each enclosure. Finish: teak. Size: (tuner/amplifier and record deck)



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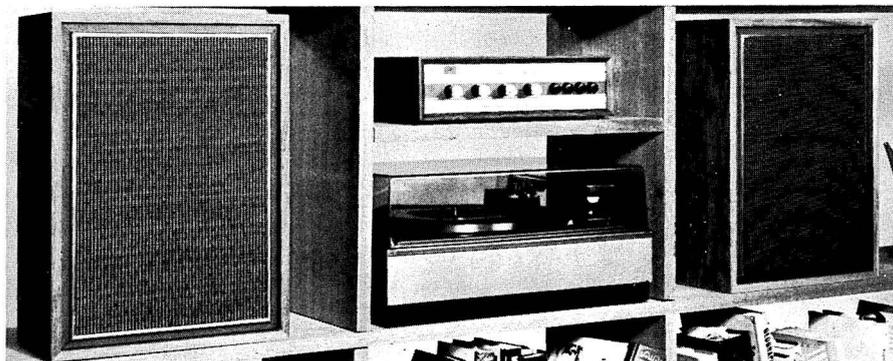
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70/71 Welbeck Street London W1  
01-486 2144



*Recommended retail prices, Teak finish, Beovox 2700 £57-90 (per pair),  
Beocord 1200 £108-75, Beogram 1200 £58-90, Beomaster 1200 £109-75.  
Rosewood finish a little extra.*



Francis Countdown system



GEC 2805

7in high, 17in wide, 15½in deep; (speakers) 13½in wide, 18½in high, 7¼in deep. Price: (complete system) £107.

#### ■ J. J. FRANCIS (WOOD GREEN) LTD

123 Alexandra Road, Hornsey, London, N8.  
Tel: 01-888 1662.

#### Countdown ★

Stereo tuner and stereo amplifier with gram unit and matching speakers. Range: 87-108MHz. Switched tuning. AFC. Multiplex decoder fitted. Controls: (tuner) on-off, mono-stereo, AFC on-off, preset tuning buttons; (amplifier) balance, volume on-off, bass, treble, mode, input selector buttons. Output: 10W RMS per channel. Output impedance: 4 ohms. Motor unit: Garrard SP25 MkII. Pickup cartridge: Orbit NM22 with diamond styli. Speakers: two Francis Countdown enclosures. Size: (radio tuner) 2¼ × 10 × 8in; (amplifier) 2¼ × 10 × 8in; (record deck) 7 × 12¼ × 14in. Finish: (plinth and speakers) solid teak. Price: (complete system) £105.40 (inc. PT).

#### ■ GEC (Radio & Television) LTD

Langley Park, Slough, Bucks.  
Tel: Slough 22201.



GEC 2807

#### 2805 ★

AM/FM stereo tuner/amplifier with record deck in cabinet plus separate speakers. Range: FM 87-108.5MHz, MW 186-572 metres, LW 1090-1950 metres, SW 18.2-52.2 metres. Variable tuning. Switched AFC. Stereo decoder optional extra. Controls: mains on-off/volume, treble, bass, tuning, balance. Pushbuttons for PU, LW, MW, SW, VHF, AFC. Output: 5W RMS per channel. FR: 30Hz-20kHz. Output impedance: 8 ohms. THD: 5% at rated output. Motor unit: BSR C141. Cartridge: Acos GP104. Size: (main unit) 15¼ × 10⅝ × 16½in; (speakers) 15¼ × 8 × 7¾in. Finish: teak veneer. Price: (complete system) £63.95 (plus £15.05 PT).

#### 2807 ★

FM/VHF stereo tuner/amplifier with record deck in cabinet plus two speakers. Range: FM 87-108.5MHz. Variable flywheel tuning. Switched AFC. Stereo decoder fitted. Controls: mains on-off, tuning, volume, treble, bass, balance, muting, AFC, mono/stereo, input selector. Output: 10W RMS per channel. FR: 30Hz-25kHz. Output impedance: 8 ohms. HD: <1% at rated output. Motor unit: Garrard SP25 Mk III. Cartridge: Acos GP104. Size: (main unit) 27 × 24 × 18¼in; (speakers) 16½ × 8¼ × 9¾in. Finish: teak. Price: (complete system) £101.19 (plus £23.81 PT).

★ Indicates entry is illustrated

### ■ HACKER RADIO LTD

Norreys Drive, Cox Green, Maidenhead,  
Berks. Tel: Maidenhead 22261/5.

#### **GAR500 Centurion ★**

Stereo transistorised tuner/amplifier in cabinet with record deck. Range: 87.5-101MHz. Variable tuning with AFC. Stereo decoder optional extra (Model GAR500/SRD). Controls: On-off, tuning, treble, bass, balance, volume, scratch filter, function selector, mono/stereo. Output: 10W RMS per channel into 8 ohms, 7W RMS per channel into 15 ohms. Class AB. FR 25Hz-30kHz  $\pm$  3dB. Output impedance: 8-15 ohms. HD: better than 0.4% at 8 ohms, 0.2% at 15 ohms. Motor: Garrard SP25 Mk III. Cartridge: Goldring G850 with diamond stylus. Size: 18in wide, 8½in high, 16in deep. Finish: teak veneer. Recommended speakers: Hacker LS1000B with three units and crossover. Price: (complete system including two speakers) £149 (inc. PT). Model with stereo decoder £10 extra.

#### **GAR1000A Tribune ★**

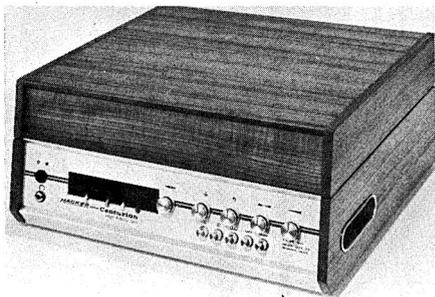
Stereo transistorised tuner/amplifier in cabinet with record deck. Range: 87.5-101MHz, 185-575 metres, 1070-1940 metres. Variable tuning with AFC. Stereo decoder optional extra (Model GAR1000A/SRD). Controls: on-off, bass, treble, balance, volume, function selector, rumble filter, scratch filter, mono/stereo, tuning, AM aerial, wavechange, AFC/muting. Output: 10W RMS per channel into 15 ohms (Class A); 15W RMS per channel into 8 ohms (Class AB). FR 20Hz-20kHz  $\pm$  2dB. Output impedance: 8-15 ohms. HD: 0.06% at 1kHz into 15 ohms with 10dB over rated input. Intermodulation distortion typically 0.06% at full power into 15 ohms. Motor unit: Lenco GL75. Cartridge: Goldring 800H with diamond stylus. Size: 13½in wide, 8½in high, 16½in deep. Finish: teak veneer. Recommended speakers: Hacker LS1500 with three units and crossovers. Price: (complete system with two speakers) £277 (inc. PT). Model with stereo decoder £10 extra.

### ■ HALCYON

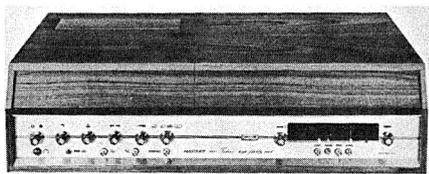
Distributors: Eurovox Ltd, The Power House,  
Headstone Lane, Harrow, Middlesex.  
Tel: 01-428 1021/4.

#### **Stereoplan 260 ★**

Stereo tuner/amplifier with built-in record deck and separate matched speakers. Range: FM 87.5-101MHz, MW 186-571m, LW 1170-2050 m. Variable tuning. Switchable AFC. Internal ferrite rod aerial for MW, socket for external FM dipole. Controls: treble and on-off, bass, volume, balance, mono/stereo, tape, gram, radio, AFC, tuning. 15 transistors, 6 diodes. Output: 4W RMS per channel. Output impedance: 12 ohms. Gram unit: Garrard 2025



*Hacker Centurion GAR500*



*Hacker Tribune GAR1000A*



*Halcyon Stereoplan 260*



*Heathkit AD-27 Compact*

TC. Lightweight tubular arm. Cartridge: Acos GP104 ceramic. Input/output socket for tape recorder. Speaker units: high-flux 8 × 5in full range in bass reflex enclosures. Finish: teak. Price: £71.43 (plus £16.57 PT).

### ■ HEATHKIT

Manufactured by Heath (Gloucester) Ltd, Bristol Road, Gloucester.  
Tel: Gloucester 29451.

#### Heathkit Stereo Compact ★

AD27 tuner/amplifier and record deck, Ambassador speakers (2). Transistorised. Range: FM 88-108MHz. Variable tuning. AFC. Multiplex decoder fitted. Controls: tuning, selector, volume, balance, bass, treble, phase (stereo radio), on-off, speakers on-off, stereo/mono. Output: 10W RMS per channel. FR 12Hz-60kHz ±1dB. Output impedance: 4-16 ohms. HD <1%. Gram motor: BSR MA-70. Pickup cartridge: Shure M44-MB. Finish: teak or walnut. Size: 7 $\frac{7}{8}$  × 21 $\frac{7}{8}$  × 14 $\frac{3}{4}$ in. Price: (in kit form) AD-27 £92, two Ambassador speakers £33 each. Total: £158.

### ■ HIS MASTERS VOICE

British Radio Corporation Ltd, 284 Southbury Road, Enfield, Middlesex. Tel: 01-366 1155.

#### HMV 2450 ★

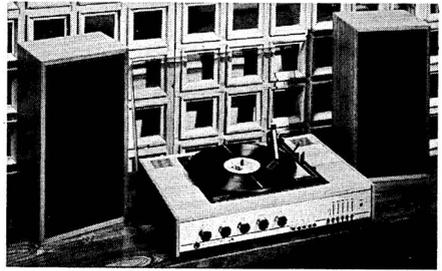
FM stereo tuner/amplifier with record deck and two separate speaker enclosures. Five preset FM stations with pushbutton selection. AFC. Stereo decoder fitted. Controls: mains on-off, bass, treble, balance, volume, pushbutton input selector, pushbutton station selector. Output: 15W RMS per channel. FR: 40Hz-16kHz ±1dB (30Hz-20kHz ±3dB). Output impedance: 4 ohms. HD: <0.5% at rated output. Motor unit: BSR P128. Cartridge: Goldring G800M magnetic. Size: (main unit) 21 $\frac{3}{4}$  × 7 $\frac{1}{2}$  × 14 $\frac{1}{2}$ in. Finish: walnut veneers. Speaker enclosures: two 5in high-compliance bass drivers and one 3 $\frac{3}{8}$ in tweeter in each cabinet. Crossover: L/C network at 1.5kHz. Size: (speakers) 18 $\frac{1}{2}$  × 9 $\frac{3}{4}$  × 8in. Price: (complete system) £139 (plus £26.47 PT).

### ■ HITACHI SALES (UK) LTD

Park House, Coronation Road, Park Royal, London, NW107QS.  
Tel: 01-965 9861. Telex: 932268.

#### KST3400

Three-piece audio system comprising AM/FM stereo radio with cassette recorder and two separate speaker enclosures. Range: MW and VHF. Tape speed: 1 $\frac{7}{8}$ i/s. Compact cassettes. Stereo decoder incorporated. Special 'black-out' dial with pilot light function indicators. AC



HMV 2450

mains. Size: (recorder/radio unit) 21 × 10 × 5 $\frac{1}{2}$ in; (speaker boxes) 10 × 10 × 5 $\frac{1}{2}$ in. Price: £126.

#### DPK310

Three-waveband stereo tuner/amplifier with record deck in plinth cabinet with separate speaker enclosures. Range: LW, MW and VHF. Stereo decoder fitted. Output: 5W per channel. Two-speed single record player. Separate bass and treble controls. Matching walnut finished cabinets. AC mains 220-240V 50Hz. Size: (main unit) 16 $\frac{1}{8}$  × 7 $\frac{1}{2}$  × 16in; (speaker boxes) 9 × 14 $\frac{1}{8}$  × 6 $\frac{1}{2}$ in. Price: £109.

New range of complete audio systems being introduced shortly. Details of prices and specifications not available at time of going to press.

### ■ ITT-KB

Consumer Products Division, Foots Cray, Sidcup, Kent. Tel: 01-300 7733.

#### KA650

Stereo tuner/amplifier with record deck and two omni-directional speakers. Stereo decoder optional extra. Range: FM/VHF. Variable tuning. Controls: mains on-off, volume, bass, treble, balance, input selector, tuning, low-level listening. Output: 15W per channel. Output impedance: 8 ohms. Stereo beacon. Record deck: BSR MA70. Ceramic cartridge with diamond stylus. Sockets for tape record and playback. Size: 18 × 18 $\frac{5}{8}$  × 8in. Finish: teak. Speakers: 6 $\frac{1}{2}$ in dual-cone units housed face-upwards in cylindrical cabinets. Price: £101 (inc. PT).

#### KA2010

AM/FM tuner/amplifier with record deck and choice of two speaker systems. Range: FM, LW, MW, SW. Slider type controls for bass, treble, volume and balance. Output: 10W per channel. Finish: teak with detachable hinged lid. Sockets for tape record and playback. Outputs for speakers (8 ohms) and stereo phones. BSR C116 four-speed changer. Ceramic cartridge with single-tip diamond stylus. Speakers: (KS653) 8 × 5in driver in bass reflex enclosure. Teak finish with slatted front. Size: 15 $\frac{3}{4}$  × 9 $\frac{7}{8}$  ×

★ Indicates entry is illustrated

6in; (KS651) 6½in upward-facing unit in omnidirectional cylindrical cabinet. Size: 13½in high, 10½in diameter. Price: (KA2010 with two KS653) £98; (KA2010 with two KS651) £107.

## ■ LUXOR

Distributors: Luxitone, 84 Bolsover Street, London, W1. Tel: 01-636 2901.

### Luxor 5002 ★

Transistorised. Range: 87-101MHz. Variable and preset tuning. AFC. Multiplex decoder optional. Controls: mains on-off, treble cut and boost. AFC on-off, volume, selector, preset tuning, balance, bass cut and boost. Output: 9W RMS per channel. FR 35Hz-18kHz. Output impedance: 3-5 ohms. HD 3% at rated output. Luxor motor. Luxor cartridge. Size: 6 × 20 × 12in. Speakers: Luxor KH500 (2). Price: (complete system) £90-95 (plus £21-40 PT).

As above but with Luxor KH520 speakers (2). Price: (complete system) £115.

## ■ MUSICRAFT

Musicraft Audio Products Ltd, 63 High Street, Hounslow, Middlesex. Tel: 01-570 4640.

### Musicraft 10-10

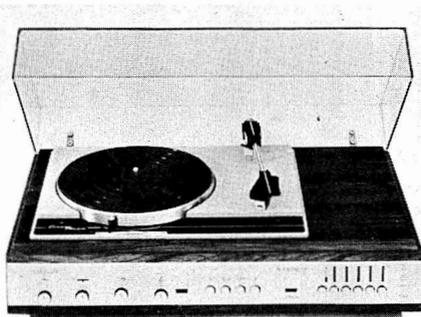
Transistorised stereo tuner/amplifier with gram unit. Range: FM 88-108MHz. Variable tuning. AFC. No radio decoder. Controls: selector, treble, bass, volume on-off, balance. Output: 10W RMS per channel. FR: 30Hz-20kHz ± 2 dB. Output impedance: 8-15 ohms. HD: 0-4% at rated output. Motor unit: Garrard SP25. Cartridge: Shure M3D. Size: 24½ high, 27in wide, 17½in deep. Speakers: Jordan Watts module in recommended enclosure. Finish: teak veneer. Price: £140 (inc. PT).

## ■ NATIONAL PANASONIC

Distributors: Unamec Ltd, PO Box 1, United Africa House, Blackfriars Road, London, SE1. Tel: 01-928 2070.

### Panasonic SG-999A

Stereo tuner/amplifier with 'hide-away' record deck and twin speaker enclosures. Range: FM 87-5-108MHz, MW 187-571m. Stereo decoder fitted. 21 transistors, 15 diodes. Controls: treble, bass, volume, mains on-off, balance, FM radio selector, AFC switch, tuning. Visual indicators on bass, treble and volume controls. FET input stage. Output: 10W per channel. Speaker enclosures with two units in each. One 7in long-throw bass driver, one 2½in tweeter. Four-speed automatic changer with lightweight tubular arm. Stereo ceramic cartridge. Auxiliary inputs. Finish: oiled walnut or teak. Size: (main unit) 6 × 18 × 16in; (speaker



Luxor 5002



Onkyo SM-10

boxes) 10½ × 14 × 6 in. Weight: (main unit) 30½lb; (speaker boxes) 5¼lb each. Price: £142-05 (plus £28-15 PT).

## ■ NIVICO

Denham & Morley Ltd, Denmore House, 453 Caledonian Road, London, N7. Tel: 01-607 6568. Telex: 24562.

### MSL-201E

Stereo tuner/amplifier with record deck in cabinet with transparent lid plus two speakers. Range: FM 88-108MHz, MW 187-567 metres. Variable tuning. Stereo decoder fitted. Output: 5W per channel (music power). Two-speed motor. Lightweight PU arm with high-compliance ceramic cartridge and diamond stylus. Speakers: 6½in full-range drivers. Impedance: 8 ohms. Size: (main unit) 19 × 6½ × 14½in; (speakers) 15½ × 10 × 7½in. Price: £95-50 (inc. PT).

### MSL-501E

Stereo tuner/amplifier with record deck in cabinet with transparent lid plus two speaker enclosures. Amplifier incorporates sound effect preamplifier. Range: FM 88-108MHz, MW 187-567 metres. Variable tuning. Stereo decoder fitted. Sound effect amplifier controls: 60Hz, 250Hz, 5kHz, 15kHz centre frequencies adjustable ±10dB. Output: 17W per channel (music power). Output impedance: 8 ohms. Two-speed turntable (33½, 45 rpm). Tubular arm with high-

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put quality first

compliance ceramic cartridge and diamond stylus. Speaker enclosures with 6½in bass drivers and 2in tweeters. Size: (main unit) 19¾ × 6¾ × 14¾in; (speakers) 14 × 11½ × 7½in. Price: £143-25 (inc. PT).

#### 4344U

AM/FM stereo tuner/amplifier with record deck, tape cassette recorder and two matching speakers. Range: FM 88-108MHz, MW 187-567 metres. Variable tuning. Stereo decoder. Output: 22.5W music power per channel. Output impedance: 8 ohms. Aerial input: 75 ohms coaxial. Switchable AFC. ¼-track cassette recorder. Speed: 1⅞i/s. DC motor. Four-speed automatic record deck. Ceramic cartridge with diamond stylus. Speakers: 6½in bass driver and 2in tweeter in each enclosure. FET front-end. 34 transistors and 23 diodes. Size: (main unit) 21½ × 7⅞ × 16in; (speakers) 16 × 9¼ × 7½in. Price: £225-60 (inc. PT).

#### ■ NORDMENDE

Distributors: TAK Continental Importers, 16a High Street, Stone, Staffordshire. Tel: Stone 3232, 3233.

#### 8002

Comprises 8002/PE record deck, /ST tuner-amplifier and T40 tape recorder, all designed to DIN 45 500 standards. Motor unit is four speed with precision adjustment, arm suitable for all ½-in centre cartridges but fitted with Shure M75MG cartridge as standard. Tuner-amplifier covers VHF, 30.6-51m; MW and LW with five VHF presets. Uses FETs and gives 30W RMS per channel. Recorder is ¼-track three-motor design with three speeds and featuring automatic tape tension control and built-in slide type mixing console for mono and stereo and mic, radio and gram inputs. Prices: /PE £72-45, /ST £162-75, /T40 £163-80 (inc. PT).

#### ■ ONKYO

J. Parkar & Company (London) Ltd, Parkar House, 1 Paul Street, London, EC2. Tel: 01-628 4577.

#### SM-600

Stereo tuner/amplifier in cabinet with record deck, plus matching speaker enclosures. 23-transistor circuit. Range: FM 88-108MHz, MW 187-562 metres. Variable tuning. AFC. Stereo decoder fitted. Controls: volume, treble, bass, tuning, balance, input selector. Output: 6W RMS per channel. Output impedance: 8 ohms. Stereo beacon. Own record deck. High-compliance ceramic cartridge. Two-speed motor. Tubular lightweight arm with auto return. Matching reflex speaker enclosures with 8in full-range units. Satin finished wood cabinets. Size: (amplifier/player unit) 16½ × 7½ × 14¼in;

(speaker enclosures) 14½ × 11 × 6¾in. Price: (complete system) £115.

#### SM-10 ★

Stereo tuner/amplifier in cabinet with record deck, plus matching speaker enclosures. 23-transistor circuit. Range: FM 88-108MHz, MW 187-562 metres. Variable tuning. AFC. Stereo decoder and beacon fitted. Controls: (slider type) balance, volume and treble/bass; (rotary type) tuning, input selector. Output: 6W RMS per channel. Output impedance: 8 ohms. Own two-speed record deck with lightweight tubular arm and high-compliance ceramic pickup. Automatic return of pickup arm and switch-off. Reflex speaker enclosures with 8in full-range units. Finish: matt wood grain cabinets with black control panel and brushed aluminium trim. Size: (tuner/amplifier/player unit) 18¾ × 7⅞ × 15½in; (speaker enclosures) 15½ × 9⅞ × 7in. Price: (complete system) £125.

#### Dynamic Four 700

Separate stereo tuner/amplifier, record unit and two speaker enclosures. 23-transistor circuit. Range: FM 88-108MHz, MW 187-562 metres. Variable tuning with AFC. Stereo decoder and stereo beacon. Controls: volume, bass, treble, balance, input selector, mono/stereo, loudness, mains on-off. Output: 14W RMS per channel. Output impedance: 8 ohms. Own two-speed deck with lightweight tubular arm and high compliance ceramic cartridge. Pickup arm automatically returned at end of record. Speaker enclosures with 6½in bass driver and 5in mid-range and HF unit in each. Sizes: (tuner/amplifier) 16½ × 4½ × 12½in; (record deck) 16½ × 6¼ × 12¾in. Price: (complete system) £150.

#### Multiac 50D

Separate stereo tuner/amplifier, record unit and two speaker enclosures. 48-transistor circuit. Range: FM 88-108MHz, MW 187-562 metres. Variable tuning with AFC. Stereo decoder and beacon fitted. Controls: bass, treble, volume, balance, mono/stereo, input selector, loudness, speaker switching, muting, AFC switch, high filter, tape monitor control, automatic gain presets. Output: (four channels) 9W RMS per channel. Four amplifiers; two bass and two HF. FR: 40Hz-20kHz. Distortion: <0.1% at rated output. Own two-speed belt drive motor unit. 12in aluminium turntable. Lightweight balanced tubular arm. Induced magnet cartridge. Bias compensator. Reflex type enclosures with 12in bass driver, 4¾in mid-range unit, horn tweeter in each. Crossover: 500Hz, 9kHz. Impedance: 8 ohms. Finish: matt wood grain with black and brushed aluminium trim. Size: (tuner/amplifier) 17¾ × 5½ × 11¼in; (record deck) 17¾ × 7½ × 14¼in; (speaker enclosures) 15¼ × 24¼ × 11¾in. Price: £325.

★ Indicates entry is illustrated

## ■ PHILIPS ELECTRICAL LTD

Century House, Shaftesbury Avenue,  
London, WC2. Tel: 01-437 7777.

### RF834

Solid-state stereo radio-gram system, decoder being an optional extra, with two speaker enclosures. Ranges: 87.5-104MHz, 187-560m 1180-2000m. Variable tuning. Switchable AFC. Philips GC047 autochanger unit with GP300 crystal pickup. Power output: 3W RMS per channel at 10% total HD. FR ( $\pm 3\text{dB}$ ): 40Hz-20kHz. Output impedance: 8 ohms. Controls: waveband buttons, tuning, AFC, gram, volume, balance, bass, treble. Finish: teak. Dimensions:  $16\frac{1}{2} \times 14\frac{1}{2} \times 7\frac{1}{2}$ in; speakers, containing 5in dual-cone unit,  $7\frac{1}{4} \times 7\frac{1}{4} \times 10\frac{1}{2}$ in. Price: £89 (inc. PT).

### System

Comprising GA105 record deck, RH690 tuner, RH580 amplifier, RH481 speakers. Solid-state stereo. Ranges: 87.5-108MHz, 187-577m, 1154-2000m. Variable tuning. AFC. Decoder fitted. Philips GC005 single record player with GP200 ceramic pickup. Output: 6W per channel, HD: <1.5% for 2x5W. FR ( $\pm 3\text{dB}$ ): 50 Hz-20kHz. Output impedance: 8 ohms. Controls: waveband, input selection, tuning, volume, balance, bass, treble, on-off. Finish: simulated teak. Dimensions: tuner,  $13 \times 2\frac{7}{8} \times 8\frac{1}{2}$ in; amplifier-control unit,  $13\frac{1}{8} \times 2\frac{7}{8} \times 8\frac{1}{2}$ in; record deck,  $13 \times 5 \times 9\frac{1}{2}$ in; speakers, with 5in dual-cone unit,  $7\frac{1}{4} \times 10\frac{1}{4} \times 7\frac{3}{8}$ in. Price complete: £118.50 (inc. PT).

### System

Comprising GA105 record deck, RH781 tuner-amplifier, RH481 speakers. Solid-state stereo. Ranges: 87.5-108MHz, 30.6-50.4m, 185-214m, 213-580m, 800-2000m. Variable tuning plus 3 VHF presets. AFC. Decoder fitted. Philips GC005 single player with GP200 ceramic pickup. Output:  $5\frac{1}{2}$ W per channel. HD <2% at 1kHz at  $2 \times 4\frac{1}{2}$ W. FR: 35Hz-20kHz. Output impedance: 8 ohms. Controls: waveband buttons, gram, volume, balance, bass, treble, on-off. Finish: teak veneer. Dimensions: tuner-amplifier  $20\frac{1}{4} \times 4\frac{3}{8} \times 8\frac{7}{8}$ in, record deck,  $13 \times 5 \times 9\frac{1}{2}$ in; speakers, with 5in dual-cone unit,  $7\frac{1}{4} \times 10\frac{1}{4} \times 7\frac{3}{8}$ in. Price: £117.98 (inc. PT).

### System

Comprising RH892 tuner-amplifier-player and RH482 speakers. Solid-state stereo. Ranges: 87.5-108MHz, 187-571m, 1154-2000m. Variable tuning. Decoder fitted. AFC. Philips GC008 single player with GP213 ceramic cartridge. Power: 8W per channel RMS. HD: 2% at  $2 \times 6$ W. FR ( $\pm 3\text{dB}$ ): 60Hz-20kHz. Output impedance: 8 ohms. Controls: waveband, tuning, input selection, mono/stereo, volume, balance, bass, treble, scratch filter, rumble

filter, on-off. Finish: teak. Dimensions:  $21\frac{3}{4} \times 6\frac{1}{2} \times 11\frac{1}{2}$ in; speakers, with 7in dual-cone unit,  $9\frac{7}{8} \times 13\frac{1}{4} \times 7\frac{3}{8}$ in. Price: £151 (inc. PT).

### System

Comprising GA308 record deck, GP400 cartridge, RH790 tuner-amplifier, RH496 speakers. Solid-state stereo. Ranges: 87.5-108MHz, 16.7-50.4m, 187-571m, 1154-2000m. Variable tuning with 3 VHF presets. Decoder fitted. AFC, switchable. Output: 25W per channel RMS. HD: 0.3%. FR ( $\pm \frac{1}{2}\text{dB}$ ): 20Hz-20kHz and ( $\pm 3\text{dB}$ ) 10Hz-50kHz. Controls: waveband, tuning, AFC, input selection, mono/stereo, volume, loudness, balance, bass, treble, scratch filter, on-off. Finish: teak. Dimensions: tuner-amplifier,  $20\frac{1}{4} \times 4\frac{3}{8} \times 10\frac{1}{2}$ in; record deck,  $15\frac{1}{2} \times 13\frac{1}{4} \times 5\frac{1}{8}$ in; speakers, containing 8in, 5in and 1in units,  $13\frac{1}{2} \times 18\frac{1}{8} \times 8\frac{7}{8}$ in. Price: (complete) £265.75 (inc. PT).

### System

Comprising GA202 record deck, RH691 tuner, RH591 amplifier, RH497 speakers. Ranges: 87.5-108MHz, 16.2-50.8m, 187-571m, 750-2000 m. Variable tuning. Decoder fitted. AFC, switchable. GC002 transcription player with GP400 magneto dynamic pickup. Output: 25W per channel RMS. HD: 0.3%. FR ( $\pm \frac{1}{2}\text{dB}$ ): 20Hz-20kHz and ( $\pm 3\text{dB}$ ) 10Hz-50kHz. Finish: teak. Dimensions: tuner,  $14\frac{1}{8} \times 3\frac{7}{8} \times 10\frac{3}{8}$ in; amplifier-control unit,  $16\frac{1}{2} \times 3\frac{7}{8} \times 10\frac{3}{8}$ in; record deck,  $15\frac{1}{2} \times 13\frac{1}{4} \times 5\frac{1}{8}$ in; speakers, containing 10in, 5in and 1in units,  $16\frac{1}{4} \times 21\frac{1}{4} \times 8\frac{7}{8}$ in. Price: £320 (inc. PT).

### System

Comprising RH891 tuner/amplifier/player deck and two RH407 speaker enclosures. Range: 87.5-100MHz. Sensitivity:  $3\mu\text{V}$  for 26dB S/N. Variable tuning plus three preset electronically tuned stations. Switchable AFC. Stereo decoder with beacon. Tuning meter. Output: 25W RMS per channel into 8 ohms. HD: 0.2% at 20W per channel. FR: 20Hz-30kHz  $\pm 1.5\text{dB}$ . S/N: >90 dB weighted. Controls: volume (with switchable loudness), bass  $\pm 12\text{dB}$  at 100Hz, treble  $\pm 14\text{dB}$  at 10kHz, balance 0 to -16dB per channel. Scratch filter. Two switched headphone outlets. Inputs: tape 100mV 100K, aux 100mV 100K. Motor unit: Philips GC002. Cartridge: GP400. Speakers: two type RH407. Price: (complete system) £283 (inc. PT).

### System

Comprising GA308 record deck, GP400 cartridge, RH702 tuner/amplifier, RH402 speaker enclosures. Four wave-band tuner with five preset FM stations. Output: 13W per channel RMS. Transcription record deck with magneto-dynamic cartridge. Compact speaker systems. Full details of specification given in the appropriate directory sections. Price: (complete system) to be announced.

### ■ PYE LTD

PO Box 49, St Andrews Road, Cambridge.  
Tel: Cambridge 58985.

#### 1550 ★

Console audio system. Radio coverage: VHF 87.5-104MHz, MW 185-215 and 220-580 metres, LW 800-2000 metres, SW 31-50 metres. Variable tuning. AFC. Stereo decoder fitted. Controls: pushbuttons for waveband and function selection; rotary treble, bass, volume and balance; three preset programmes. Output: 6.5 RMS per channel. FR 50Hz-20kHz. Output impedance: 4 ohms. Distortion: <2% at 1 kHz at 4.5W. Motor unit: BSR P128. Cartridge: SC5M. Size: (excluding speakers) 20½in wide, 29½in high, 14in deep. Speakers: LSE.10/4 enclosures, each having 8in driver and 3in tweeter. Built-in crossover. Finish: teak veneer. Price to be announced.



Pye 1550

### ■ RADON

Radon Industrial Electronics Co. Ltd,  
Brooklands Trading Estate, Orme Road,  
Worthing, Sussex. Tel: Worthing 34904.

#### Arundel AP200 ★

Transistorised stereo tuner/amplifier and gram unit in compact table style cabinet. Range: 87-106MHz. Variable tuning. AFC. Stereo decoder fitted. Controls: input selector, AFC on-off, volume, balance, bass, treble, scratch filter, rumble filter, tuning, mains on-off. Output: 10W RMS per channel. FR: 35Hz-18kHz. Output impedance: 8-15 ohms. HD: 0.1% at rated output. Motor unit: Garrard SP25 Mk II or Garrard SL65B. Pickup cartridge: Goldring G800H. Size: 8½ × 22 × 16in. Finish: teak with transparent cover, teak surround.



Radon AP 200 Arundel

Complete systems available with Radon Pearl, Emerald, Opal, or Topaz speakers. Prices from approximately £160 to £250 for complete system.

Arundel prices (less speakers): Standard model with SP25 deck (AP200/A) £88.48 inc. PT; De luxe model with tuner and SP25 deck (AP200/B) £106.18 inc. PT; Super model with SL65B deck (AP200/C) £98.59 inc. PT; Super de luxe model with tuner and SL65B deck (AP200/D) £111.23 inc. PT.

#### AP200 stand

Wooden stand to suit all Arundel models. Price: £6.



Radon AP 200/C

### ■ RGD

ITT-KB Ltd, Consumer Products Division,  
Footscray, Sidcup, Kent. Tel: 01-300 7733.

#### PA550

Stereo tuner/amplifier with record deck and choice of three speaker systems. Range: FM/VHF (stereo decoder optional extra). Variable

★ Indicates entry is illustrated

tuning. Controls: mains on-off, volume, bass, treble, balance, input selector, tuning. Output: 15W per channel. Output impedance: 8 ohms. Stereo beacon. Special low-level listening switch. Record deck: BSR MA70. Ceramic cartridge with diamond stylus. Sockets for tape record and playback. Size: 18 × 18½ × 8in. Speakers: choice of KS651 6½in units in cylindrical cabinet giving 360° dispersal, KS653 8 × 5in units in teak finished cabinets with slatted fronts, or KS655 with 6½in driver and 3½in tweeter in standard rectangular cabinets. Finish: teak. Price: (PA550 and two KS651) £103; (PA550 and two KS653) £94; (PA550 and two KS655) £103. All prices include PT.



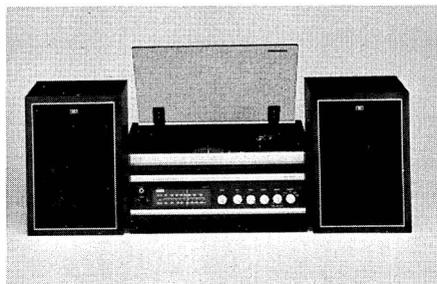
Sanyo DC 91

## ■ SANSUI

Vernitron Ltd, Thornhill, Southampton, SO9 5QF. Tel: Southampton 44811.

### Sansui MC50

AM/FM stereo tuner/amplifier in cabinet with record deck and two separate speakers. Output: 10W RMS per channel into 8 ohms. Motor unit with 12in aluminium turntable. Induced magnet cartridge. Controls: treble, bass, balance, input selector, tuning, loudness, mains on/off, tape monitor, volume. Speakers: Sansui SP30 (two). Price: (complete system with two speakers) £227.95 (inc. PT).



Sharp GS5600

## ■ SANYO

Sanyo Marubeni (UK) Ltd, Sanyo House, Bushey Mill Lane, Watford, Herts. Tel: Watford 25354/6.

### DC91 ★

Tuner/amplifier with record player and two matched speakers. 20 transistors plus three FETs. Range: FM 88-108MHz, MW 187-560m. Variable tuning. AFC. Multiplex decoder fitted. Controls: mains on-off, speaker switching, bass, treble, volume, tuning, balance, input selector. Output: 6W RMS per channel. FR: 40Hz-30kHz. Output impedance: 8-16 ohms. Distortion: <0.6% at rated output. Sanyo induction gram motor. MGT III ceramic cartridge. Wood grain finish to cabinets. Size: (tuner/amplifier/gram) 7 × 18 × 20in; (speakers) 10 × 8 × 17½in. Price: (complete system) £129.95.

### DS93E

AM/FM tuner/amplifier with record unit in walnut veneered cabinet. Range: FM/VHF and medium wavebands. Motor unit: 33½ and 45 rpm. Semi-automatic operation, tone arm returns at end of record. Stereo decoder fitted. Output: 15W music power per channel. Sockets for tape recorder and stereo headphones. Output for two sets of stereo speakers. Price:

(DS93E unit) £99.95; (Sanyo SX-X speakers enclosures) £17.95 each.

## ■ SHARP

Sharp Electronics (UK) Ltd, 48 Derby Street, Manchester, M8 8HN. Tel: 061-832 6115.

### GS5400

Tuner/amplifier, record deck and separate matching speakers. Transistors. Range: 88-108 MHz, 186-566m. Variable tuning. AFC. Stereo decoder fitted. Controls: on-off tone, left hand volume, right hand volume, tuning, function selector. Output: 6W RMS per channel. FR: 30Hz-17kHz. Output impedance: 8 ohms. Sharp motor (double insulation). Sharp ceramic pick-up cartridge. Speakers: 6½in full-range. Finish: walnut. Size: (tuner/amplifier record unit) 8¼ × 18½ × 13in; (speaker enclosures) 8¼ × 6¾ × 11½in. Price: £72.86 (plus £17.14 PT).

### GS5500

Tuner/amplifier, record deck and separate matching speakers. Transistors. Range: 88-108 MHz, 186-566m. Variable tuning. AFC. Stereo decoder fitted. Controls: on-off, bass, treble, balance, volume, AFC on-off, tuning, function selector. Output: 12W RMS per channel. FR: 30Hz-17kHz. Output impedance: 8 ohms. Sharp

# We knew it was good. . . and the experts now confirm it



## **'Hi-Fi Sound' March 1971**

For its price the UA700 is an excellent amplifier and has a performance that compares with that of amplifiers costing more. It is well designed and constructed and its facilities are more than adequate for the usual Hi-Fi signal sources.

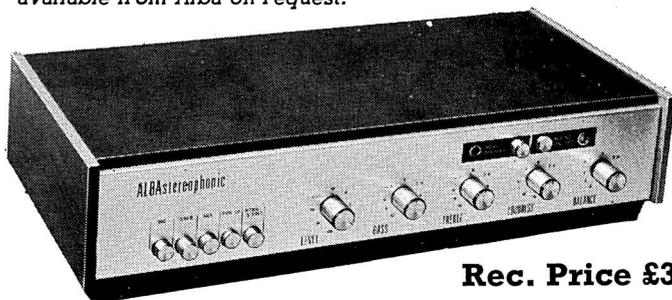
## **'Hi-Fi News' March 1971**

I found the subjective performance at least equal to that of amplifiers costing almost twice as much—power capacity apart. This is a budget Hi-Fi amplifier that I can thoroughly recommend.

## **'The Gramophone' May 1971**

The designers have introduced one or two novel touches and have not slavishly turned out yet another carbon copy of what went before. Mechanically the unit has been designed for trouble-free running and ease of servicing. It has been a pleasure to test this new amplifier and find that, contrary to the impression one sometimes receives with the audio units assembled by radio and TV Companies, the design is quite forward-looking and offers excellent value at its low price of £34.50.

*Copies of the articles from which these extracts were taken, together with fully illustrated literature, are available from Alba on request.*



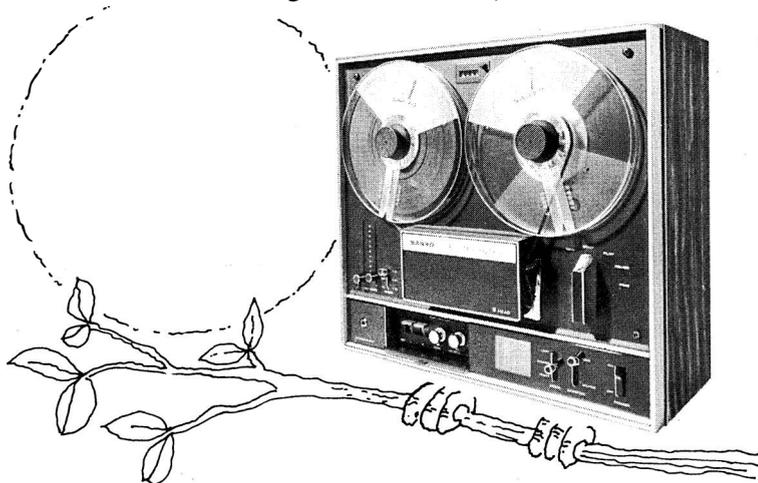
**Rec. Price £34.50**

# ALBA

Alba (Radio and Television) Ltd.,  
Tabernacle Street, London E.C.2.

# Sanyowise

(or how to make the intelligent choice in hi-fi)



The two important things you have to look at are quality and price. And it's very difficult to find a sensible balance.

Unless you examine Sanyo equipment. Take the stereo tape deck (model MR-805) for instance.

For quality you get a 4-track, 3-head deck. Monitoring of a recording in progress from source or from tape. Recording capabilities including sound-on-sound, sound-with-sound and echo effects. Tape hiss and noise suppressed by a novel "actual noise silencer". A real professional studio performance.

For price - £99.95\*.

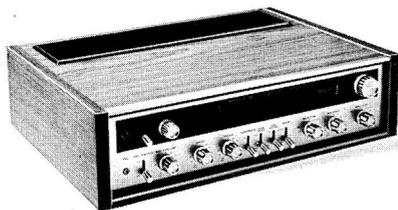
You'll discover the same sensible balance with all Sanyo stereo products. (And they make a tremendous range.)

Another example is their solid state tuner/amplifier (model DCX 2300K). A slim, neat set, it gives a total music power of 45 W, and has FM stereo radio with fitted multiplex. Yet still only costs £99.95\*.

Be Sanyowise when you are searching for the best buys.

Send for the free Sanyo brochures of audio equipment.

\*Recommended retail price.



**SANYO**  a world of difference

Write to: Sanyo Marubeni (U.K.) Ltd., Bushey Mill Lane, Watford, Herts.

motor. Sharp high-compliance ceramic cartridge. Speakers: 6½in bass driver, 3½in horn tweeter. Finish: walnut. Size: (tuner/amplifier record deck) 8½ × 18½ × 16in; (speaker enclosures) 10 × 8½ × 15½in. Price: £1111.72 (plus £26.28 PT).

#### GS5600 ★

Tuner/amplifier, record deck and matching speakers. Range: 88-108MHz, 186-566m. Variable tuning. AFC. Stereo decoder fitted. Controls: mains on-off, tuning, bass, treble, volume, balance, AFC on-off, function selector. Output: 21W RMS per channel. FR: 30Hz-20kHz. Output impedance: 8 ohms. Sharp motor unit. Sharp magnetic cartridge. Speakers: 8in bass driver, 4in diecast horn tweeters. Finish: walnut. Size: (tuner/amplifier record unit) 9½ × 22 × 16½in; (speaker enclosures) 11½ × 17 × 9½in. Price: £160.29 (plus £37.71 PT).

#### ■ SKANDIA ELECTRONICS

Distributor: Golding Audio Ltd, Marks Tey, Colchester, Essex. Tel: Colchester 210433.

#### SK120

System comprises tuner/amplifier incorporating stereo eight-track cartridge tape recorder. Range: FM 88-108MHz, MW 187-567 metres. Variable tuning. AFC. Stereo decoder fitted. Controls: volume, tuning, record level (right channel), record level (left channel), balance, AM/FM radio, low filter, high filter, treble, input selector, mono/stereo. Output: 45W RMS per channel. FR: 20Hz-20kHz. Output impedance: 8 ohms. HD: <3%. Size: 29½ × 6½ × 13½in. Recommended speakers: Golding X100. Finish: walnut. Price: (main unit less speakers) £176 (plus £47.19 PT).

#### SK308

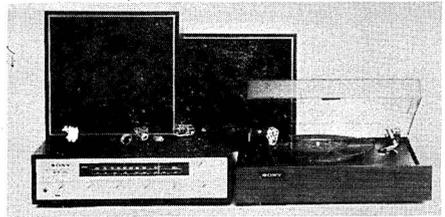
System comprises tuner/amplifier incorporating stereoeight-trackcartridgetape recorder. Range: FM 88-108MHz, MW 187-567 metres. Variable tuning. AFC. Stereo decoder fitted. Controls: volume on-off, record level (right, channel), record level (left channel), balance, treble, bass, selector 1, selector 2, record on, play tape, stop tape. Output: 10W RMS per channel. FR: 30Hz-35kHz. Output impedance: 8 ohms. HD: <3%. Matching three-unit speakers. Finish: walnut. Price: (complete system) £150 (plus £40.22 PT).

#### ■ SONY (UK) LTD

Pyrene House, Sunbury Cross, Sunbury on Thames. Tel: Sunbury on Thames 87644/7.

#### HP-122 ★

Comprises stereo tuner-amplifier, record deck and two speakers. Ranges: 87-108MHz, 187-566m. Variable tuning. Decoder fitted. Switch-



Sony HPI22



Tandberg Hi-Fi FM

able AFC. Output: 3W per channel at 8 ohms. FR: 45Hz-15kHz. HD: less than 5%. Motor: Sony PS-122. Cartridge: Sony VX-13P crystal. Each speaker contains 6½in woofer and 2in tweeter. Dimensions: tuner-amplifier 16½ × 12½ × 4½in; record deck 16½ × 12 × 5½in. Finish: walnut. Price: £79.20 (plus £19.55 PT).

#### HP-488

Comprises stereo tuner/amplifier in shelf-mounting case with two separate bookshelf speakers. Range: FM 87-108MHz, MW 187-560 metres. Variable tuning. Stereo decoder fitted. Aerial input: (FM) 300 ohms balanced, (AM) internal ferrite rod. Output: 10W RMS per channel. HD: <1%. Two-speed turntable unit (33½ and 45 rpm). Pickering V15H/AT3 moving magnet cartridge. Speaker enclosures with 6½in bass driver and 3in tweeter in each. Two FETs, 33 transistors, 27 diodes. Mains: 100, 117, 220 or 240V 50/60Hz. Size: (main unit) 17½ × 8½ × 15½in; (speakers) 14½ × 14½ × 7½in. Finish: oiled walnut. Price: to be announced.

#### ■ TANDBERG

Farnell-Tandberg Ltd, 81 Kirkstall Road, Leeds. Tel: Leeds 35111.

★ Indicates entry is illustrated



Toshiba SP790



Toshiba SM290

### System ★

Comprising hi-fi FM tuner-amplifier with Farnell-Tandberg turntable unit plus 3000X recorder and Tan 7 speakers. Range: 87.5-108 MHz. Variable and preset tuning. Decoder fitted. AFC. Output: 15W per channel into 4 ohms. FR ( $\pm 2$ dB): 40Hz-18kHz. HD: 1%. Record unit uses Thorens TD150 Mark 2 turntable and Shure M3D cartridge. Finish: teak or rosewood. Dimensions:  $17 \times 8\frac{1}{2} \times 5\frac{1}{4}$ in. Price: on application.

### System

Comprising Huldra 9 tuner-amplifier with Farnell-Tandberg turntable plus 6000X recorder and Tan 15 speakers. Ranges: 87.5-108MHz, 10.9-27.3m, 27.3-66.5m, 66.5-167m, 187-580m, 1000-2000m. Variable and preset tuning. Decoder fitted. AFC. Output: 15W per channel into 4 ohms. FR ( $\pm 2$ dB): 30Hz-20kHz. HD: 1%. Shure M55E cartridge. Finish: teak or rosewood. Dimensions:  $21\frac{1}{4} \times 10\frac{3}{8} \times 5\frac{1}{2}$ in. Price: on application.

### TELETON

Teleton Electro (UK) Ltd, Teleton House, Robjohns Road, Widford, Chelmsford, Essex. Tel: Chelmsford 62442. Telex: 99338.

#### 2S60F

Three unit stereo system. Range: FM 88-108 MHz, MW 187-560 metres. Variable tuning.

Sensitivity: FM  $10\mu$ V. Controls: input selector, volume, bass, treble, tuning, balance. Output: 5W per channel. FR: 50Hz-15kHz. Output impedance: 8 ohms. Input: tape 300mV. Stereo headphone socket, tape socket. Stereo decoder with auto switching. Record player: 33 $\frac{1}{3}$  and 45 rpm. Induction motor. Two FETs, 18 transistors, 13 diodes. Mains: 110-220V 50Hz. One 6in full-range driver in each speaker enclosure. Size: (main unit)  $17 \times 5\frac{3}{8} \times 13\frac{1}{2}$ in; (speaker enclosures)  $11\frac{1}{2} \times 8 \times 5\frac{1}{2}$ in. Price: £75 (inc. PT).

### TOSHIBA

Distributors: Hanimex (UK) Ltd, Hanimex House, 15-24 Great Dover Street, London, SE1. Tel: 01-407 8161.

#### FS2500

AM/FM stereo radio/tuner/amplifier and record player in three-piece system. Range: FM 88-108 MHz, AM 187-565m. Output: 7.5W per channel. Motor unit: 33 $\frac{1}{3}$ , 45 rpm. 11 $\frac{1}{2}$ in aluminium turntable. Toshiba ceramic cartridge. Speakers: (2) 6 $\frac{1}{2}$ in full range units in separate acoustic enclosures. Mains: 230-250V AC. Size: (tuner/amplifier/gram unit)  $6\frac{1}{4} \times 16 \times 13\frac{1}{2}$ in; (speakers)  $7\frac{3}{4} \times 11\frac{1}{4} \times 6\frac{3}{8}$ in. Weight: 21lb. Price: £89.50 (inc. PT).

#### SM500Y

AM/FM stereo tuner/amplifier and record player in three-piece system. Range: FM 88-108 MHz, AM 187-565m, SW1 50-150m, SW2 16.5-50m. Stereo decoder fitted. Output: 12W per channel. Speakers: (2) 8in bass driver, 3 $\frac{1}{2}$ in horn tweeter. Motor unit: 33 $\frac{1}{3}$ , 45 rpm. Moving magnet cartridge. Controls: bass, treble, balance, tuning, volume, mains on-off, AFC on-off, low-pass filter, high-pass filter, loudness. Size: (tuner/amplifier/gram unit)  $10 \times 21\frac{1}{4} \times 16\frac{1}{2}$ in; (speakers)  $11 \times 17\frac{1}{2} \times 7\frac{3}{8}$ in. Price: £169.

#### SP850PY

AM/FM stereo tuner/amplifier and gram unit in three-piece system. Range: FM 88-108MHz, AM 187-565m, SW1 50-150m, SW2 16.5-50m. Stereo decoder fitted. Output: 17.5W per channel. Transcription motor unit. Slim tubular arm with Toshiba IC cartridge. Speeds: 33 $\frac{1}{3}$ , 45 rpm. Belt driven turntable. Flywheel tuning. Finish: satin American walnut with black and silver control panel. Three-way speakers. Full details and specification on request. Price: £248 (inc. PT).

#### SP790 ★

Stereo transistor tuner/amplifier in console cabinet with record deck and two separate matching speaker enclosures. Range: MW and FM/VHF. Variable tuning with AFC on FM. Multi-frequency response tone control system. Output: 25W per channel. Integrated circuit



Van Der Molen Sonic 88

(IC) pickup cartridge. Infinite baffle enclosures, each with three units. Satin wood finish. Full specification on request. Price: £289 (inc. PT).

#### SM290 ★

Stereo transistor tuner/amplifier in shelf-mounting cabinet with single play belt-drive record deck. Two separate speaker enclosures. Range: FM 88-108MHz, MW 187-572 metres. Variable tuning. Stereo decoder fitted. Slider controls for volume, stereo balance, bass and treble. Output: 8W RMS per channel. FR: 50Hz-20kHz. Crosstalk: 13dB at 1kHz (pickup). W and F: 0.2% watt RMS at 3kHz. Speaker enclosures with bass driver, crossover and tweeter in each. Size: (main unit)  $18\frac{1}{2} \times 5\frac{7}{8} \times 15\frac{1}{2}$ in; (speakers)  $18\frac{1}{2} \times 9\frac{7}{8} \times 7\frac{3}{8}$ in. Price: £133 (inc. PT).

#### ■ VAN DER MOLEN LTD

1 Mildmay Road, Romford, Essex, RM77DA.  
Tel: Romford 41904.

#### Sonic 77

Tuner/amplifier with record desk combined.

Stereo. 17 transistors. Range: 88-108MHz, 185-570m. Variable tuning. AFC. Controls: volume, on-off, bass, treble, balance, tuning, speaker on-off; push-buttons for gram, MW, VHF, AFC on-off, external input. Output: 5W per channel. FR: 40Hz-18kHz. Output impedance: 12 ohms. H and N: -55dB. Crosstalk: -45dB. Bass control:  $\pm 12$ dB at 50Hz. Treble control:  $\pm 12$ dB at 10kHz. Sockets for external FM dipole and AM aerial. Headphone socket (4-15 ohms). Motor unit: Garrard 2025TC. Cartridge: Sonotone 9TAHC. Mains: 230-250V 50Hz. Speakers: wide-range unit in vented enclosure size  $10\frac{3}{4} \times 7\frac{3}{8} \times 6\frac{1}{2}$ in. Size: (amplifier player unit)  $9\frac{1}{2} \times 18 \times 16\frac{1}{2}$ in. Price: £85-90 (inc. PT).

#### Sonic 88 ★

Tuner/amplifier with record deck combined. Stereo. 17 transistors. Range: 88-108MHz, 185-570m. Variable tuning. AFC. Controls: volume, on-off, bass, treble, balance, tuning, speaker, on-off; pushbuttons for gram, MW, VHF, AFC on-off, external input. Output:

★ Indicates entry is illustrated

11W per channel. FR: 40Hz-18kHz. Output impedance: 4 ohms. H and N: -65dB. Cross-talk: -45dB. Bass control:  $\pm 12$ dB at 50Hz. Treble control:  $\pm 12$ dB at 10kHz. Sockets for FM dipole and AM aerial. Headphone socket: 4-15 ohms. Turntable unit: Garrard SP25 Mk III. Cartridge: Sonotone 9TAHC. Diamond LP stylus. Mains: 230-250V 50Hz. Speakers: 6 $\frac{1}{2}$ in bass driver and 3in mid range unit and 1in tweeter in infinite baffle. L/C crossover. Size: (speakers) 10  $\times$  16  $\times$  7 $\frac{3}{8}$ in; (unit) 9 $\frac{1}{2}$   $\times$  18  $\times$  16 $\frac{3}{4}$ in; Price: £114-50.

## ■ YAMAHA

Distributors: Jonathan Fallowfield Ltd,  
56-60 St John Street, London, EC1.  
Tel: 01-253 7591.

### MC40

AM/FM stereo tuner/amplifier fitted in console cabinet with record deck, plus two separate speaker cabinets. Range: FM 88-108MHz, MW 186-560 metres. Variable tuning with AFC. Stereo decoder fitted. Controls: mono-stereo selector, volume, bass, treble, balance, tuning, loudness, input selector. Output: 10W RMS per channel. FR: 20Hz-30kHz. Impedance: 8 ohms. HD: 0-15% at rated output. Yamaha two-speed transcription turntable. Magnetic cartridge. Speakers: two Yamaha NS10 (alternatively NS15). Size: (main unit) 23  $\times$  16  $\times$  8in. Finish: American oiled walnut. Price: (with NS10 speakers) £199-50 (inc. PT).

### MC50A

AM/FM stereo tuner/amplifier with record deck and eight-track tape cartridge system. Range: 88-108MHz, MW 187-565 metres. Variable tuning with AFC. Stereo decoder fitted. Controls: mono/stereo selector, tuning, bass, treble, balance, tape deck selector, volume. Includes unit for playing back eight-track stereo cartridges. Output: 15W RMS per channel. FR: 20Hz-30kHz. Output impedance: 8 ohms. HD: <0.5%. Yamaha two-speed motor unit. Magnetic cartridge. Speakers: NS15 (alternatively NS20). Size: (main unit) 28  $\times$  10  $\times$  17in. Finish: American oiled walnut. Price: (with NS15 speakers) £329-95 (inc. PT).

### MC50B

AM/FM stereo tuner/amplifier with record deck and cassette tape recorder. Range: FM 88-108MHz, MW 187-565 metres. Variable tuning with AFC. Stereo decoder fitted. Controls: mono/stereo selector, tuning, bass, treble, balance, volume, cassette record, mic level (left), mic level (right). Output: 15W RMS per channel. FR: 20Hz-30kHz  $\pm 2$ dB. HD: 0-15% at 10W per channel. Yamaha two-speed transcription record deck. Magnetic cartridge. Speakers: NS15 (alternatively NS20). Size: (main unit)

27 $\frac{1}{2}$   $\times$  16 $\frac{1}{2}$   $\times$  9in. Finish: American oiled walnut. Price: (with two NS15 speakers) £344-95 (inc. PT).

### MC50

Similar specification to MC50A and MC50B but without the eight-track cartridge unit or cassette tape recorder. Price: (with NS15 speakers) £304-95 (inc. PT).

### MC600

AM/FM stereo tuner/amplifier with two-speed record deck and two separate speakers. Range: FM 88-108MHz, MW 187-565 metres. Variable tuning with AFC. Stereo decoder fitted. Controls: tape selector, mono/stereo selector, input selector, volume, balance, bass, treble, wavebands, muting, mains on-off, main or remote speakers. Output: 15W RMS per channel. FR: 20Hz-30kHz  $\pm 2$ dB. Output impedance: 8 ohms. HD: 0-15%. Yamaha two-speed transcription record deck. Magnetic cartridge. Speakers: NS15 (alternatively NS20 or NS30). Size: (main unit) 17  $\times$  12 $\frac{1}{2}$   $\times$  5in. Finish: American oiled walnut. Price: (with NS15 speakers) £329-95 (inc. PT).

# PHILIPS



## No rumble of discontent

If you want to listen to music and not hear equipment, this Philips Audio Plan is for you.

The GA202 'Electronic' record player is now better than ever. Motor speed is continuously monitored by an electronic brain which suppresses any tendency towards wow and flutter within micro-seconds.

Turntable speeds can be individually finely-adjusted by three separate fingertip controlled potentiometers. Turntable and pick-up arm are mechanically insulated from the sound-proof motor. So rumble is incredibly low.

Floating suspension and a viscosity-damped pick-up manipulator permit highly accurate cueing.

The counter-balanced pick-up arm has very low tracking error, self regulating sidetrust compensation in all positions and stylus force adjustable from 1 to 4 grams.

Photo-electronic automatic switch-off is utterly silent and applies no side-trust to the pick-up arm.

The GA202 is supplied as standard with a slide-in head shell fitted with Philips Super M magneto-dynamic

cartridge GP400. A universal slide-in support for standard  $\frac{1}{2}$ " mounting is also supplied.

Superbly styled.

**Stereo Amplifier** Team the GA202 Electronic with Philips RH591 stereo amplifier. 2 x 35 watts music power (2 x 25 watts continuous); frequency response 10 - 50,000 Hz  $\pm$  3dB (20 - 20,000 Hz  $\pm$  0.5dB); switchable physiological compensation to prevent loss of treble and bass when you turn volume down; scratch, rumble and presence switches, total distortion less than 0.4%. A real powerhouse!

**Loudspeaker Enclosures** Round-off your system with Philips RH497 loudspeaker enclosures—of the infinite baffle type, handling up to 40 watts, with 10" woofer, 1" tweeter, 5" Mid-range and crossover network, giving a frequency range from 30 to 20,000 Hz.

This selection will cost you around £240 or more, but you will receive your reward in beautiful sound. If your pocket is more humble, never fear. We have humbler systems. See your Philips Audio Specialists. And write for our Audio and Tape Recorder Brochures.

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**instant  
peace**

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County \_\_\_\_\_

# Hi Fi Headphones

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ AKAI

Rank Audio Products, PO Box 70,  
Great West Road, Brentford, Middlesex.  
Tel: 01-568 9222. Telex: 24408.

### ASE-9S

Stereo headphones with acoustic control. Impedance: 8 ohms. Maximum input: 500mW. FR: 25Hz-15kHz. Weight: 18oz approx. Length of cord: 6ft. Price: £6-50.

### ASE20

Stereo headphones with acoustic loudness control. Impedance: 8 ohms. Maximum input: 500mW. FR: 25Hz-18kHz. Weight: 17oz approx. Length of cord: 6ft. Price: £9.

### ASE22

Stereo headphones. Built-in mechanical two-way system. Mylar film diaphragms. Impedance: 8 ohms. FR: 20Hz-20kHz. Normal input: 1mW. Maximum input: 500mW. Sensitivity: 110dB. Weight: 18oz approx. Price: £11.

## A.K.G.

Distributors: A.K.G. Equipment Ltd,  
182/184 Campden Hill Road, Kensington,  
London, W8. Tel: 01-229 3695.

### K60 ★

Dynamic stereo headphones. FR: 16Hz-20kHz. Impedance: 75 ohms  $\pm 20\%$  per channel over entire range, or 600 ohms  $\pm 20\%$ . Distortion: <1% max output. Weight: 7oz. Ear cushions removable for washing. Price: £14-50.

## ■ AMPLIVOX

Amplivox Communications Ltd, Beresford  
Avenue, Wembley, HA01RU, Middlesex.  
Tel: 01-902 8991.

### Astrolite

High quality moving coil headphones. FR: 50 Hz-15kHz. Impedance 200 ohms. Wired for mono or stereo. Price on application.

### Astrolite LS33 ★

Lightweight moving coil headphones. FR: 20

Hz-20kHz. Sensitivity: 0.5mW produces comfortable listening level. Power input: 700mW for 2% total distortion (3W momentary overload). Impedance: 200 ohms per earphone, may be connected in series, parallel or wired independently for stereo. Contoured earshells with detachable foam cushions. Fully adjustable headband. A special version with boom microphone available (LS336). Prices on application.

## ■ BUSH-ARENA

Rank Bush Murphy Ltd, Power Road,  
Chiswick, London, W4. Tel: 01-994 6491.

### K600 ★

Stereo headphones. FR: 10Hz-16kHz. HD: <1% at maximum output. Impedance: 4-16 ohms.  $3\frac{1}{2}$ in driver units. Removable foam-filled ear cushions. 10ft coiled connection lead with jack plug. Price: £11-90.

## ■ CITY AUDIO SERVICES LTD

7 Chalcot Road, London, NW1.  
Tel: 01-586 3211/2.

### SE.1

Stereo headphones. Wired for complete channel separation. FR: 25Hz-15kHz. Price: £4-95.

### SE.21

Stereo headphones. Each earpiece contains separate low and high frequency units with individual tweeter adjustment. FR: 25Hz-18kHz. Price: £10-20.

### SE.28

Stereo headphones with extended response due to domed acoustic chambers and special tweeters. Individual adjustment of each dome. FR: 20Hz-20kHz. Price: £11-10.

### SE.40

Stereo headphones. Comfortable cushioned earpads exclude extraneous noises. High sensitivity units in acoustic chambers. FR: 25Hz-16kHz. Price: £5-95.

## ■ CLARK

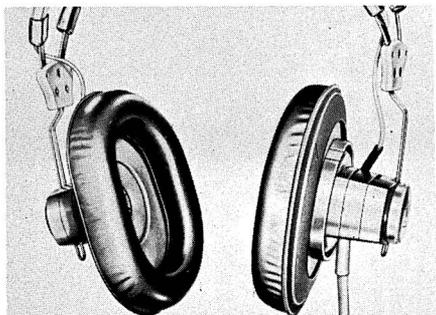
Sonab Ltd, 136 Mansfield Road, Acton,  
London, W3. Tel: 01-993 0849.

### Clark 100

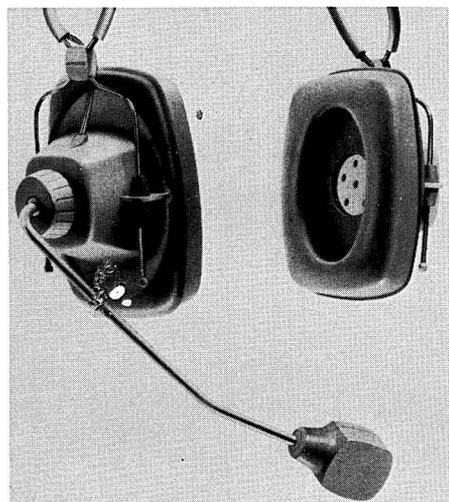
Stereo headphones. FR: 10Hz-20kHz. Distortion: <0.2% at 100 phn. Maximum power input: 1W per earpiece. Sensitivity: 1mW produces 100 phn at 1kHz. Weight: 16oz. Washable earseal covers. 10ft extended coil cord with moulded plug. Impedance: 8 ohms (also available in 300, 600 and 1200 ohms). Price: £18-65.

### Clark 200

Stereo headphones. FR: 20Hz-17kHz. Sensitivity: 1mW produces 105 phn at 1kHz.



A.K.G. K60



Amplivox Astrolite LS33



Bush-Arena K600

Maximum power input 1W per earpiece. Impedance: 8 ohms. Weight: 16oz. 10ft extended coil cord with moulded plug. Price: £12.65.

#### Clark 300

Stereo headphones. FR: 20Hz-17kHz. Impedance: 8 ohms. Weight: 15oz. 10ft extended coil cord with moulded plug. Price: £9.20.

#### ■ DUETTE

Distributors: J. J. Silber Ltd, 11 Northburgh Street, London, EC1. Tel: 01-253 8031.

#### ES350 ★

Stereo headphones. Impedance: 8-16 ohms. FR: 25Hz-13kHz. Max input: 0.5W. Price to be announced.

#### ES300 ★

Stereo headphones. Impedance: 8-16 ohms. FR: 25Hz-13kHz. Max input: 0.5W. Price to be announced.

#### ■ DYNATRON RADIO LTD

St Peters Road, Furze Platt, Maidenhead, Berks. Tel: Maidenhead 23331.

#### SP.2

Stereo moving-coil headphones. Light weight. Padded earpieces. Impedance 8 ohms. Price: £7.50.

#### ■ EAGLE INTERNATIONAL

Heather Park Drive, Wembley, HA11SU. Tel: 01-903 0144.

#### S.E.1 ★

Professional Stereo Headphones. FR: 25Hz-14 kHz. 3in dynamic speakers. Isolated right and left channels. 'Flexifoam' seals. Dual impedance 15 ohms. Price: £4.95.

#### S.E.21

Professional two-way stereo headphones. FR: 25Hz-18kHz. Each headphone contains 2½in LF unit and ½in treble unit. Level controls and built-in attenuator to protect ears. Impedance 16 ohms. Stereo cable and plug. Adjustable headband. Foam rubber earpads. Price: £10.20.

#### S.E.5 ★

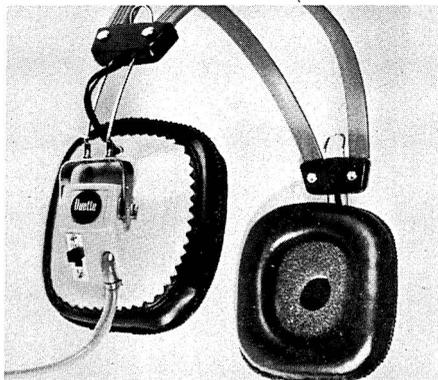
Budget stereo headphones. FR: 30Hz-15kHz. Lightweight single headband. Impedance: 8 ohms. Price: £2.95.

#### S.E.28

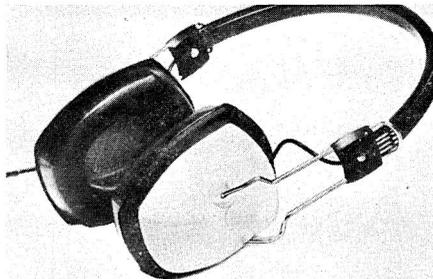
Studio stereo headphones. FR: 20Hz-20kHz. Dome chambers. Separate LF and tweeter units. Impedance: 8 ohms. Adjustable attenuators. Price: £11.10.

#### S.E.30 ★

Studio stereo/mono headphones. FR: 30Hz-16



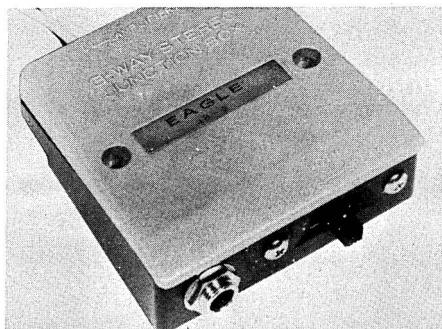
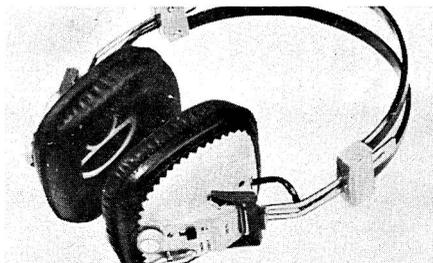
Duette ES350



Eagle SE5



Eagle SE30



Eagle JB-33



Eagle SE1



Eagle SE80

★ Indicates entry is illustrated

kHz. Built-in stereo/mono switch. Impedance: 8 ohms. Leather ear cushions. Price: £7.35.

**JB33 ★**

Stereo headphone and speaker switching and attenuation unit. Jack socket for phones. Switch permits phones only, speakers only, or both together. Moulded case Price: £1.50.

**S.E.60**

Studio stereo headphones. FR: 25Hz-18kHz. Impedance: 8 ohms. Lightweight with punched ventilated headband. Price: £8.50.

**S.E.80 ★**

Studio stereo headphones. FR: 20Hz-20kHz. Impedance: 8 ohms. Individual slider tone controls. Based on open baffle concept. Price: £15.

**S.E.100**

Professional stereo headphones. FR: 20Hz-21kHz. Impedance 8 ohms. Independent volume controls, dual-cone earpieces. Price: £16.

■ **ECHO**

Sole Distributors: Adastra Electronics Ltd, Unit 22, Cricklewood Trading Estate, Clarendon Road, London, NW21TU. Tel: 01-452 6288

**HS.606D**

Dual impedance mono headphones. Specially designed for monitoring, electronic musical instruments, language laboratories, etc. Instant switching from 8-16 ohms to 4K. Adjustable earpieces. Soft padded ear cushions. FR: 25Hz-17kHz. Power handling capacity: 0.5W. Supplied with 5ft lead fitted with jack plug. Price: £5.

■ **GRUNDIG (Great Britain) LTD**

Newlands Park, London, SE26. Tel: 01-778 2211.

**211a**

High-quality stereo headphones. Fitted with J25 plugs. FR: 30Hz-20kHz. Distortion factor 1% at 1mW, 3% at 90mW. Impedance 400 ohms per system. Supplied with 5½ft cable and J21 plugs. Price: £7.50.

**220**

High-quality stereo headphones. Fitted with 5½ft of cable and J25 plugs. FR: 16Hz-20kHz. Distortion factor less than 0.3% at intensities of 120 phon. Fluid-filled ear covers. Padded headband. Impedance 400 ohms per system. Supplied with J21 plugs. Price: £22.65.

■ **HITACHI SALES (UK) LTD**

Park House, Coronation Road, Park Royal, London, NW97QS. Tel: 01-965 9861. Telex: 932268.

New range of stereo headphones being introduced shortly. Details of prices and specifications not available at time of going to press.



Howland-West CIS300



I.T.T. Components 65/1B



Kirkman Cleen

### ■ HOWLAND-WEST LTD

2 Park End, South Hill Park, London, NW3.  
Tel: 01-794 6666/6033.

#### CIS.300 ★

Stereo headphones. Supplied complete with standard 'stretch' cable and alternative remote control cable featuring left- and right-channel volume controls and mono/stereo switch. FR: 18Hz-21kHz. Impedance: 8 ohms. Price: £9.

### ■ ITT-STC

Standard Telephones & Cables Ltd,  
Electro-Mechanical Product Division,  
West Road, Harlow, Essex. Tel: Harlow 26811.

#### 65/1B ★

Broadcast quality headset. FR: 30Hz-15kHz. Impedance: 300 ohms. Foam rubber earpads. Supplied complete with 54in tinsel cable. Price on request.

### ■ KIRKMAN (Crawley) LTD

40 The Broadway, Crawley, Sussex.  
Tel: Crawley 26670.

#### Clean Stereo Headphone Unit ★

Supplied in chassis form for mounting on panel or shelf (teak case will be available later). Signal from each channel is delayed and fed to opposite channel to simulate natural stereo. Three-position switch; loudspeakers, headphones, attenuated headphones. Jack socket for two pairs of phones. Impedance to amplifier 8 ohms resistive. Suitable for headphones 8-600 ohms. Size:  $3\frac{1}{2} \times 1\frac{3}{4} \times 8$ in. Price: to be announced.

#### Clean Stereo Headphones ★

Monitoring quality with good transient response. Recommended for use with Clean stereo headphone unit. Impedance: 40 ohms. Sensitivity: 104dB for 1mW at 1kHz. Weight: 16oz. Supplied with 10ft lead and jack plug ( $\frac{1}{2}$ in stereo). Sound exclusion approximately 40dB. Price: £10-50.

### ■ KOSS

Distributors: Tape Music Distributors Ltd,  
11 Redvers Road, London, N22.  
Tel: 01-888 0152.

#### SP3X ★

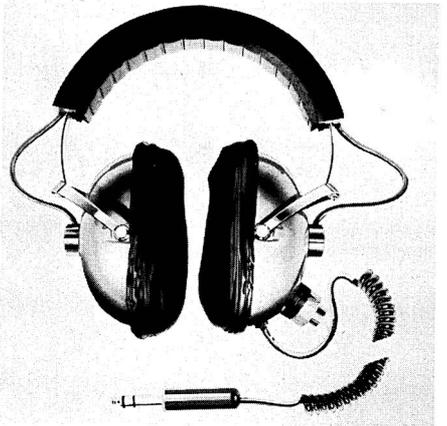
Stereo headphones. Response 10Hz-15kHz. Impedance: 4-16 ohms. Moving coil. Sponge foam earpads. Distortion less than 1% at maximum audio output. 8ft 4-way lead. Weight: 15oz. Colour: dark brown with beige ear and head cushions. Price: £9-50.

#### PRO-4AA ★

Professional quality stereo headphones. Response 30Hz-20kHz. Impedance 4-50 ohms. Moving coil. Fluid-filled ear cushions. Boom



Koss SP3X-C



Koss Pro-4AA

mic attachment. Distortion less than 1% at maximum audio output. 10ft extended coiled cord. Weight: 19oz. Ear cushions removable for washing. Colour: grey-bronze with black ear cushions and headband. Price: £28.

#### KO-727B

Sensitive stereo headphones. Will accept up to 60W (music) per channel. Suitable for 4, 8 or 16 ohms output. Removable foam-filled ear cushions. Eight-foot coiled cord for added convenience. Distortion < 1% at maximum output. Fully adjustable earpieces. Price: £16-50.

#### EC-20

Extension cord fitted with stereo jackplug and

★ Indicates entry is illustrated

socket. Adds 20ft to the length of normal stereophonic lead. Price: £3.

#### ESP-6 ★

Professional electrostatic headphones. Claimed to be a new concept, incorporating self-energised diaphragms and eliminating the moving cone driver element. Impedance: 4-16 ohms. FR: 27Hz-19kHz  $\pm$  5dB; 35Hz-10kHz  $\pm$  2½dB. Complete with fitted portable carrying case and individually measured response curve. Price: £45.

#### ESP-9

Electrostatic headphones. FR: 15Hz-15kHz  $\pm$  2dB (a total of 10 octaves, approximately 4 octaves more than standard phones). Individual machine-run calibration curve supplied with each set of phones. Designed to work from 4-16 ohms amplifier outputs. No external power supply needed, except when used for precise low-level signal measurement. For this purpose an AC line can be selected by a front panel switch on the E-9 energiser unit supplied with the phones. Fluid filled ear cushions for high ambient noise isolation. Weight: 19oz. Price: £69.

#### K-6 ★

Stereophones. Impedance: 4 ohms. FR: 10Hz-15kHz. Sensitivity: 1V at 400Hz. Maximum input: 10W per channel. Distortion: less than 1%. Foam filled vinyl ear cushions. Weight: 15oz. Price: £12.50.

#### T-1

Matching unit comprising neat moulded case containing matching transformers for monitoring 600-10,000 ohm outputs. Jacks for two sets of Koss stereophones. Price: £4.50.

#### T-5

Remote control listening station. The T-5 box can be placed in the most convenient spot and separate gain controls for each channel enable balance and volume to be set precisely at the listening position. Switch to cut off speakers and jacks for stereophones. Size: 5½ × 3½ × 2½ in. Weight: 14oz. Price: £5.

#### ■ NIKKO

Nikko Electric Mfg. Co Ltd,  
Distributors: Howland-West Ltd,  
2 Park End, South Hill Park, London, NW3.  
Tel: 01-794 6666 and 6033.

#### HW3S ★

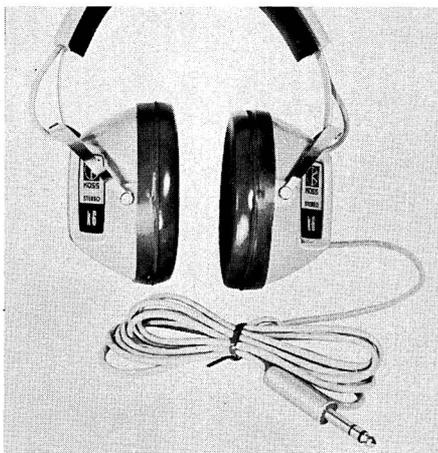
Stereo headphones. Single speaker. Impedance: 8 ohms. FR: 20Hz-18kHz. Max input: 0.3W. Price: £4.75.

#### HW4ST ★

Stereo headphones. Twin speaker, 1½ in tweeter and 3½ in woofer coaxially mounted. Fitted with



Koss ESP-6



Koss K-6



Nikko HW3S

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Right up to the aerial. Because that's where quality begins.

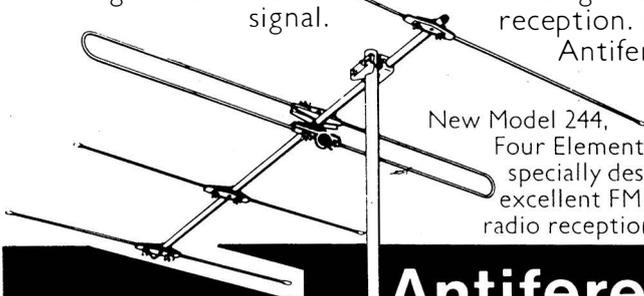
The excellence of FM reception (and it *can* be very, very good indeed) depends on a high signal to noise ratio. This is achieved only when the limiter is driven hard with as large an input signal as possible.

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specially designed for  
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the aerial to the set

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Antiference Limited Aylesbury Bucks Tel 2511



ref. 0-002 dyne cm<sup>2</sup> at -5V input. Suitable for broadcast and recording studios. Price: approximately £25.

#### HA-660 ★

Stereo. Fuse protected. For research and other uses requiring truest possible reproduction. FR: 15Hz-35kHz. Impedance: 8 ohms/side. Max output 110dB s.p.l. Attenuation of ambient noise 40dB. Sensitivity 43V RMS input for rated output. Price: approximately £34.



Sharpe HA10 Mk II

#### ■ STAX

Distributor: Wilmex Ltd, Stax Division, 24/26 Ensign Street, London, E1. Tel: 01-949 2545.

#### Stax SR-3 ★

Lightweight electrostatic headphones. Push-pull operation. FR: 30Hz-25kHz. Impedance: 130K at 10kHz. Sound pressure level: 95dB at input 100V RMS. Polarising voltage 200V DC. Adjustable headband. All metal parts stainless steel. Ear cushions of soft vinyl leather, replaceable. Total weight approximately 1lb, including cord. Price: see SRD-5 adaptor below.

#### Stax SRD-5 ★

Adaptor for use with SR-3 phones. Connects to amplifier output and provides switching between speakers and headphones, also supplies polarising voltage to phones. Mains: 100-120V AC, 200-240V AC. Price: (complete system comprising SR-3 phones and SRD-5 adaptor) £45-40.



Sharpe HA660 PRO

#### ■ TELETON

Teleton Electro (Distributors) Co Ltd, Teleton House, Robjohns Road, Widford, Chelmsford, Essex. Tel: Chelmsford 62442. Telex: 99338.

#### SH 301P ★

Dynamic stereo headphones. HC:  $\frac{1}{2}$ W. Impedance: 8 ohms (each channel). FR: 20Hz-21kHz. Weight: 13 $\frac{1}{2}$ oz. Cord: 5 $\frac{1}{2}$ ft with jack plug. Price: £3-50.

#### SH 307P

Dynamic stereo headphones. HC:  $\frac{1}{2}$ W. Impedance: 4-16 ohms. FR: 20Hz-15kHz. Weight: 13 $\frac{1}{2}$ oz. Cord: 5ft with three-pole jack plug. Price: £5.



Teleton SH301P

#### ■ TOSHIBA

Distributors: Hanimex (UK) Ltd, Hanimex House, 15-24 Great Dover Street, London, SE1. Tel: 01-407 8161.

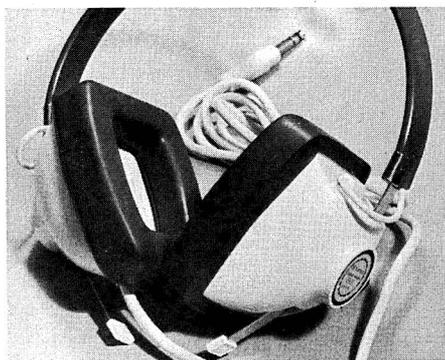
#### HR80

Stereo headphones. Incorporate Toshiba cross-field network. FR: 20Hz-20kHz. Impedance: 4-50 ohms (matching). Input power: 15mW.

★ Indicates entry is illustrated



Stax SR3 phones and SRD5 adaptor



Trio HS-2



Woollett SEC3 Headphone Blender

Weight: 12.8oz. Cord: 6½ft. Detachable washable ear covers. Finish: black, grey and chrome. Price: £6.85.

#### HR50

Stereo headphones. Incorporate Toshiba cross-field network at the turn of a switch. Lightweight

with detachable padded ear covers for easy cleaning. Specification similar to HR80. Price: £12.

#### TRIO

Distributors: B. H. Morris & Co (Radio) Ltd, 84-88 Nelson Street, Tower Hamlets, London, E12DY. Tel: 01-790 4824.

#### HS-1

Stereo headphones. Input impedance: 8 ohms, matching 4-16 ohms. Max power input: 0.5W. FR: 20Hz-19kHz. Distortion: <0.8%. Sensitivity: 118dB at 1mW input. 10ft four-core cable. Weight: 11oz (inc. cable). Price: £8.40.

#### HS-2 ★

Stereo headphones. Input impedance: 8 ohms, matching 4-16 ohms. Max power input: 0.5W. FR: 20Hz-19kHz. Distortion: <0.8%. Sensitivity: 111dB at 1mW input. 6½ft four-core cable. Weight: 11oz (inc. cable). Price: £6.75.

#### UHER

Distributors: Bosch Ltd, Rhodes Way, Radlett Road, Watford, Herts, WD24LB. Tel: Watford 44233.

#### W671/K50

Stereo moving-coil headphones. Price: £12.30.

#### W762

Monophonic moving coil headphones. Price: £12.30.

#### WOOLLETT AUDIOSTATICS

21 Anerley Station Road, London, SE20. Tel: 01-778 9003.

#### Headphone Equaliser Blender ★

Stereo. Provides variable attenuation and adjustable treble lift. Switch positions for; headphones only, headphones and speakers, or speakers only. Variable negative blend cancels out crosstalk and permits compatible stereo records to be played as full stereo. Two input and two output blocks for easy connection into speaker feeds. Fitted two yards cable for inputs and speaker feeds. Size: 6 × 5½ × 2½in. Price: £12.80.

#### YAMAHA

Distributors: Jonathan Fallowfield Ltd, 56-60 St John Street, London, EC1. Tel: 01-253 7591.

#### N/S Series

Stereo headphones with twin headband and removable washable foam-filled ear cushions. 8ft automatic coiling cord. Fully adjustable. Frequency response beyond audible limits. Stereo jack plug. Price: £12.50.

# Directory of FM/VHF Aerials

★ Indicates entry is illustrated

Abbreviations used in this section are given on page 46.

## ■ AERIALITE LTD

West Heath, Congleton, Cheshire.  
Tel: Congleton 3892/9.

**900**

Band II outdoor dipole with stand-off arm and universal bracket to fit up to 2in diameter masts. Price: £2.10.

**901**

Band II wide-spaced H array with attachment to fit masts up to 2in diameter. Price: £2.60.

**902**

Band II three-element array comprising director, folded dipole and director. Bracket for mast attachment up to 2in diameter. Price: £3.75.

**903**

Band II four-element array comprising folded dipole, two directors and a reflector. Bracket for attachment to mast up to 2in diameter. Price: £4.25.

Aerialite also manufactures a range of AM aerials including vertical rod type aerials and anti-static systems. Full details on request.

## ■ ANTIFERRENCE LTD

Bicester Road, Aylesbury, Bucks.  
Tel: Aylesbury 2511.

**Loft 233**

Band II three-element loft aerial with folded dipole. Universal mounting clamp with stand-off arm. Fully adjustable for angle and direction. Price: £2.50.

**214**

Band II single dipole (array only) with one-hole fitting for 1in dia masts. Price: £1.40.

**224**

Band II dipole and reflector array with universal clamp to fit masts up to 2in diameter. Price: £2.48.

**234**

Band II three-element array comprising folded dipole, director and reflector with universal clamp for masts up to 2in diameter. Price: £3.52.

**244 ★**

Band II four-element array with universal clamp for masts up to 2in dia (recommended by makers for stereo). Price: £3.95.

## ■ BANG AND OLUFSEN UK LTD

Eastbrook Road, Gloucester, GL4 7DE.  
Tel: Gloucester 21591.

**2010 ★**

Band II telescopic V aerial for B & O tuners and tuner/amplifiers. Fits into block in back of tuner and is supplied complete with connecting lead and plug. Price: £2.75.

## ■ BEN NEVIS AERIALS

Belmont Works, Belmont Site, Lewis Street, Stranraer, Scotland. Tel: Stranraer 2677/8.

**Ben Nevis TM902-1**

Band II single dipole with stand-off arm and universal mast clamp for 1-2in masts. Price: £1.75.

**Ben Nevis TM902-2**

Band II dipole and reflector with boom and stand-off arm and universal mast clamp. Price: £2.25.

**Ben Nevis TM902-3**

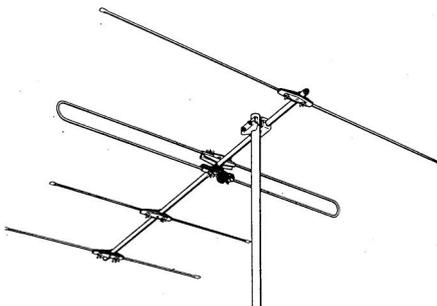
Band II three-element array comprising director, folded dipole and reflector, with stand-off arm and universal mast clamp. Price: £3.25.

**Ben Nevis TM902-4**

Band II four-element array comprising two directors, folded dipole and reflector, with stand-off arm and universal mast clamp. Price: £3.75.

**Regal RV1**

Similar to TM902-1 but aerial array plastic-coated by Plastalux process and fitted anti-vibration insulators. Ideal for exposed locations or where subject to corrosion. Price: £2.70.



*Antiferrence 244*

★ Indicates entry is illustrated

### Regal RV2

Similar to TM902-2 but array plastic-coated and fitted anti-vibration insulators. Price: £4.50.

### Regal RV3

Similar to TM902-3 but array plastic-coated and fitted anti-vibration insulators. Price: £6.83.

### Regal RV4

Similar to TM902-4 but array plastic-coated and fitted anti-vibration insulators. Price: £8.33.

VHF aerials custom-built to individual customer's specification.

## ■ HIRSCHMANN

Distributors: Audio Workshops Ltd,  
29 High Street, Robertsbridge, Sussex.  
Tel: Robertsbridge 580.

### U.1 ★

Folded dipole for VHF/FM reception. Bandwidth 88-104MHz. May also be used under certain conditions for LW, MW and SW reception. Aerial constructed of corrosion resistant alloy. Rain-proof plug-in connection box with outlets to match either 60/75 ohms coaxial cable or 240/300 ohms balanced twin feeder. Mast clamp to fit masts of up to 2½in diameter and short stand-off arm included. Price: £3.63.

### U.3 ★

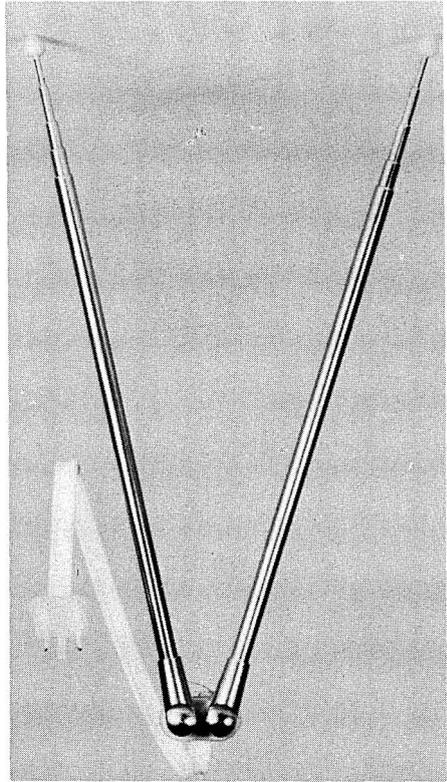
Folded dipole, reflector and director for VHF/FM reception. Bandwidth 88 to 104MHz. Aerial constructed of corrosion resistant alloy. Rain-proof plug-in connection box with outlets to match either 60/75 ohms coaxial cable or 240/300 ohms balanced twin feeder. Rectangular boom for perfect element alignment and seamless elements for strength. Tilting clamp to fit masts of up to 2½in. Gain 5.0dB. Front-to-back ratio 15dB. Price: £6.25.

### U.5 ★

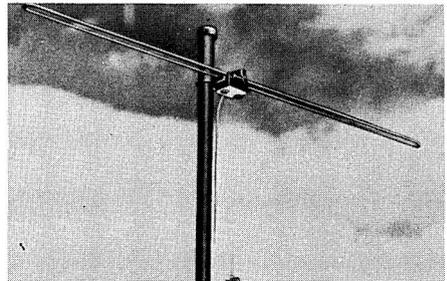
Folded dipole with two directors and special double reflector for VHF/FM reception. Specially suitable for stereo reception. Bandwidth 88 to 104MHz. Aerial constructed of corrosion resistant alloy. Rainproof plug-in connection box with outlets to match either 60/75 ohms coaxial cable or 240/300 ohms balanced twin feeder. Gain 7dB. Front-to-back ratio 18dB. Horizontal acceptance angle 63 degrees. Vertical acceptance angle 92 degrees. Mechanical length 1.45m (approx 4½ft). Electrical length 0.5 wavelength. Tilting clamp to fit masts of up to 2½in. Rectangular boom. Price: £9.63.

### U.6 ★

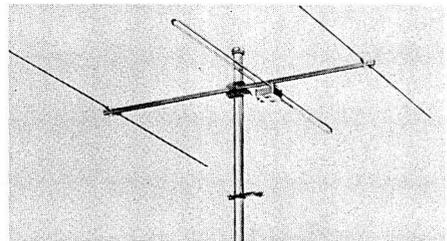
Special high-performance aerial with folded dipole, three directors and double reflector for VHF/FM reception. Specially suitable for stereo reception in particularly difficult positions. Bandwidth 88 to 104MHz. Aerial constructed



Bang & Olufsen 2010



Hirschmann U.1



Hirschmann U.3

individual tweeter controls on each earpiece. Impedance: 8 ohms. FR: 20Hz-20kHz. Max input: 0.25W. Price: £8.75.

**HW4SV**

Stereo headphones. Single speaker fitted with individual volume control on each earpiece. Impedance: 8 ohms. FR: 20Hz-19kHz. Max input: 0.3W. Price: £7.50.

**HW8S**

Stereo headphones with bass and tweeter units in each earpiece. FR: 20Hz-20kHz. Impedance: 8 ohms. Sensitivity: 110dB at 1kHz with 1mV applied signal. Coiled lead fitted with stereo plug. Price: £12.50.

**77S ★**

Stereo headphones. High response lightweight phones with silicon varistor overload protection. FR: 18Hz-21kHz. Sensitivity: 105dB/mV. Max input: 0.3W. Price: £14.



Nikko HW4ST

**PHILIPS ELECTRICAL LTD**

Century House, Shaftesbury Avenue, London, WC2.

Tel: 01-437 7777. Cables: Phillamps, London.

**EL3775/85**

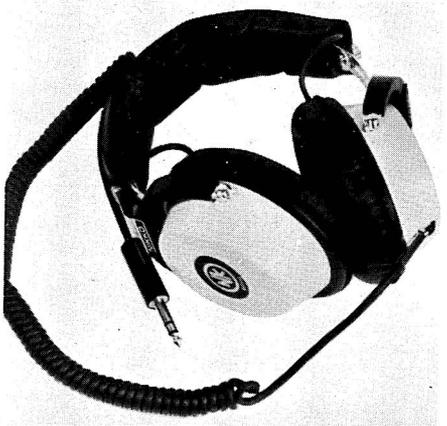
Mono headphones. FR: 300Hz-3kHz. Sensitivity: 30mV at 1kHz. Impedance: 1K. Price: £3.60.

**EL3775/38**

Stereo version of EL3775/85. Price: £5.75.

**LBB9900/50**

Stereo hi-fi headphones. FR: 20Hz-20kHz. Sensitivity: 100µBar/volt. Impedance: 600 ohms. Price: £8.50.



Nikko 77S

**ROTEL**

Rank Audio Products, PO Box 70, Great West Road, Brentford, Middlesex. Tel: 01-568 9222. Telex: 24408.

**RH600**

Stereo headphones. FR: 20Hz-19kHz. Maximum input: 500mW. Impedance: 8-16 ohms. Cord length: 10ft. Flexible covered steel headband. Sponge-filled ear cushions. Price: £5.50.

**RH711**

Stereo headphones. FR: 15Hz-25kHz. Maximum input: 500mW. Impedance: 8-16 ohms. Cord length: 15ft. Flexible covered steel headband. Sponge-filled ear cushions. Price: £9.50.

**SANSUI**

Vernitron Ltd, Thornhill, Southampton, SO9 5QF. Tel: Southampton 44811.

**SS2**

High quality stereo headphones. Moving coil. Impedance: 8 ohms. Max power input: 500mW.

FR: 20Hz-18kHz. Distortion: <1% at 1mW input. Price: £7.73.

**SS20**

High quality stereo headphones with four units. 3½in cone bass unit and 2in cone tweeter each side. Impedance: 8 ohms. FR: 20Hz-20kHz. Tone and volume controls fitted. 6½ft twin extension cord. Price: £17.75.

**SENNHEISER ELECTRONIC**

Distributors: Hayden Laboratories Ltd, East House, Chiltern Avenue, Amersham, Bucks. Tel: Amersham 5511.

Audio showroom, service department and despatch department: 12/13 Poland Street, London, W1V 3DE. Tel: 01-734 3748.

★ Indicates entry is illustrated

### **HD.110 ★**

Stereo headphones wired for mono and stereo. Robust design. Removable washable ear cushions. Easily replaceable cable. FR: 20Hz-20 kHz. Impedance: 200 ohms  $\pm 15\%$  per earpiece. Output: 1mW per capsule produces 98dB (16 $\mu$ bar) at 1kHz. Maximum output: 120dB (200 $\mu$ bar) for 1% distortion. Weight: 9oz. Price: £24.

### **HD.414**

Stereo headphones. Wired for mono or stereo. Lightweight robust design. Removable washable sponge ear pads. FR: 20Hz-20kHz. Impedance: 200 ohms per capsule. Weight: 7½oz. Price: £10-45.

### **HMD.110 ★**

Stereo headset type HD.110 with close-talking boom microphone. FR: 50Hz-14kHz. Response tailored for close speaking. Output: 0.07mV/ $\mu$ bar. Impedance: 200 ohms. Price: £28-50.

### **HMD.414 ★**

Stereo headset HD.414 with close-talking boom microphone located near corner of mouth. Especially high ratio of desired sound to background noise. Output: 0.1mV/ $\mu$ bar. Impedance: 200 ohms. Price: £25.

## **■ SHARP**

Sharp Electronics (UK) Ltd, 48 Derby Street, Manchester, M88HN. Tel: 061-832 6115.

### **HP100**

Stereo headphones. Fully adjustable slide fittings. Double headband. Padded comfortable earpieces. FR: 30Hz-18kHz. Complete with lead and jack plug. Price: £5-87.

### **HP200**

Stereo headphones. Fully adjustable slide fittings. Single headband. Padded comfortable earpieces. FR: 30Hz-17kHz. Complete with lead and jack plug. Price: £4-25.

## **■ SHARPE INSTRUMENTS**

Distributor: Carston Electronics Ltd, 71. Oakley Road, Chinnor, Oxon. Tel: 0844 52061.

London office: Shirley House, 27 Camden Road, London, NW1. Tel: 01-267 2748.

### **HA-9**

Stereo. FR: 15Hz-20kHz. Impedance: 8 ohms/side. Max input 2W. Max output 130dB s.p.l. Distortion < 1%. Attenuation of ambient noise 40dB at 1kHz. Price: approximately £14-25.

### **HA-10 Mk II ★**

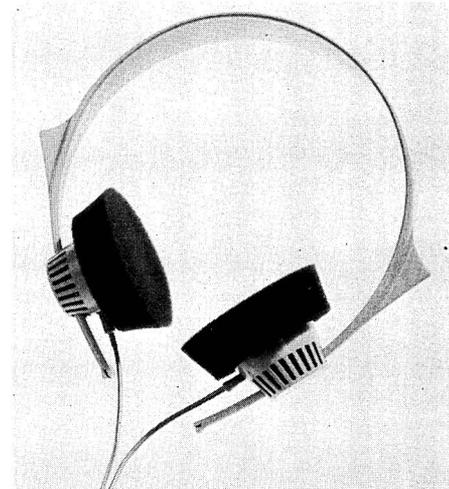
Stereo. Deluxe liquid-filled ear cushions. FR: 15Hz-30kHz. Impedance: 8 ohms/side. Max input 2W. Distortion 0.86% at 1kHz. Attenuation of ambient noise 40dB. Sensitivity 115dB



*Sennheiser HD 110*



*Sennheiser HMD 110*



*Sennheiser HD 414*

of corrosion resistant alloy. Rainproof plug-in connection box with outlets to match either 60/75 ohms coaxial cable or 240/300 ohms balanced twin feeder. Gain 7.5 to 8.5dB. Front-to-back ratio 20dB. Horizontal acceptance angle 61 degrees. Vertical acceptance angle 80 degrees. Mechanical length 2.46m (approx 8½ft). Electrical length 0.7 to 0.83 wavelength. Tilting clamp to fit masts of up to 2½in. Rectangular boom. Price: £13.50.

#### FEKO 14 ★

Coupling box to combine the outputs from two identical aerials in Band II (VHF/FM radio), complete with two input leads. This device combines the outputs from the two aerials in phase to give a combined output with an increased signal level. Coupling box constructed of black plastic (waterproof) with bracket for mounting on mast of up to 2in diameter. Total length of input leads 3.25m (approx 10½ft). Price: £6.25.

#### GEMA 1

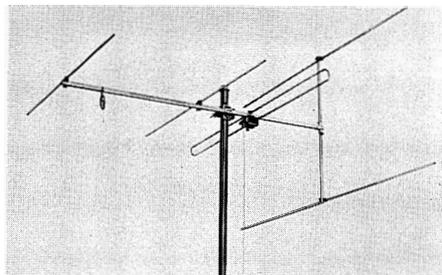
Glass fibre rod (either 2m or 3m) AM aerial and single dipole FM aerial. The AM aerial consists of a glass fibre vertical rod constructed so as to render it conducting while also retaining the durable and weather resisting properties and strength of glass fibre. Included in the head of the aerial is a transformer to match both aerials to a common 60/75 ohm coaxial cable. The appropriate transformer/adaptor lead needed to feed the separated signals to the AM and FM input sockets for the tuner is supplied for either 60/75 ohms or 240/300 ohms inputs. Price: (2 metre rod and all accessories) £15.39; (3 metre rod and all accessories) £16.79.

#### GEMA 3 ★

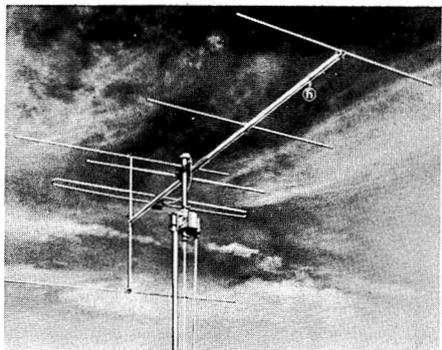
Glass fibre rod (either 2m or 3m) AM aerial and 3-element FM aerial for stereo reception. The AM aerial consists of a glass fibre vertical rod constructed so as to render it conducting while also retaining the durable and weather resisting properties and strength of glass fibre. Included in the head of the aerial is a transformer to match both aerials to a common 60/75 ohm coaxial cable. The appropriate transformer/adaptor lead needed to feed the separated signals to the AM and FM input sockets of the tuner is supplied for either 60/75 or 240/300 ohms inputs. Prices: (2 metre rod and all accessories) £20.51; (3 metre rod and all accessories) £21.91.

#### GEMA 4

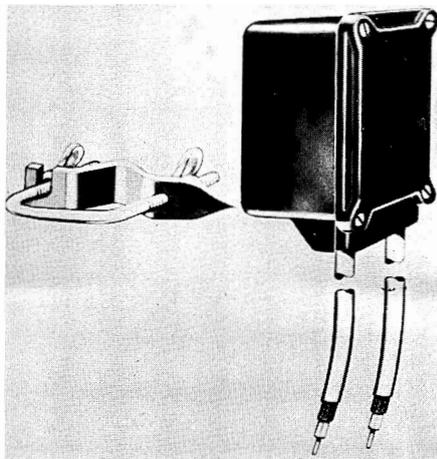
Glass fibre rod (either 2m or 3m) AM aerial and 2-element crossed dipole omni-directional aerial for FM reception. The AM aerial consists of a glass fibre vertical rod constructed so as to render it conducting while also retaining the durable and weather resisting properties and strength of glass fibre. Included in the head of



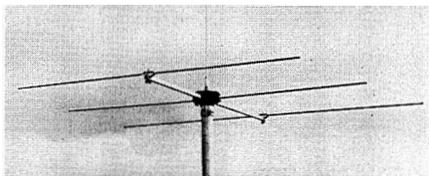
Hirschmann U.5



Hirschmann U.6 on rotator



Hirschmann Feko 14



Hirschmann Gema 3

★ Indicates entry is illustrated

the aerial is a transformer to match both aerials to a common 60/75 ohm coaxial cable. The appropriate transformer/adaptor lead to feed the separated signals to the FM and AM input terminals of the tuner is supplied for either 60/75 ohm coaxial input or 240/300 ohms balanced twin input. Prices: (2m rod and all accessories) £18.76; (3m rod and all accessories) £20.16.

#### DR 610

Continuously variable attenuator. Input and output for 60/75 ohm coaxial cable. Max RF input 100mW. White plastic housing. Size: diameter 2 $\frac{3}{4}$ in, height 1 $\frac{1}{4}$ in. Price: £4.30.

#### SYM 5

Balun to match 60/75 ohms coaxial cable to 240/300 ohms balanced twin feeder. Frequency range 40 to 850MHz. (All TV Bands and VHF/FM radio.) White plastic housing with standard coaxial input socket and 4in long balanced twin feeder output lead. Price: £1.75.

#### SYM 15

Balun to match 60/75 ohms coaxial cable to 240/300 ohms balanced twin feeder. Frequency range 40 to 850 MHz. (All TV Bands and VHF/FM radio.) Black plastic waterproof housing with mast clamp to fit masts of up to 2in diameter. Input and output connections made via terminals. Price: £1.88.

#### SYD 60

Balun to match 60/75 ohms coaxial cable to 240/300 ohms balanced twin feeder combined with variable attenuator, loss may be varied over the range of 12 to 30dB. Frequency range 40 to 850MHz. (All TV Bands and VHF/FM radio.) Input standard coaxial socket, output lead 4in of balanced twin feeder. White plastic housing. Price: £2.08.

### ■ J. BEAM ENGINEERING LTD

Rothersthorpe Crescent, Northampton,  
NN49JD. Tel: Northampton 63531 (7 lines).  
Telex 311101.

#### FMG.1

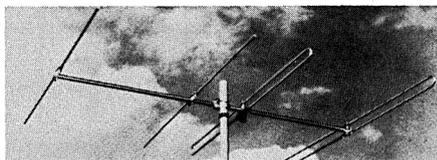
Band II dipole with 7in stand-off aluminium arm with universal grip to fit any mast up to 2in diameter.  $\frac{3}{8}$ in aluminium elements with heavily plated universal clamp. Price: £1.90.

#### FM2

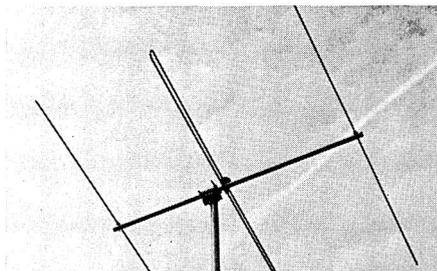
Band II dipole with reflector, 1in diameter aluminium boom, heavily plated universal clamp to fit any mast up to 2in diameter.  $\frac{3}{8}$ in aluminium elements. Rustproof precision-cast fitting and waterproof junction box. Price: £2.50.

#### FM3.L

Band II dipole, reflector and director for loft mounting. Price: £2.60.



J-Beam FM4S



Maxview D/FD3

#### FM4.S ★

Band II folded dipole, two directors and folded reflector. Specially designed for stereo radio which calls for a larger signal input to overcome the drop in signal-to-noise ratio due to the multiplex stereo system. Each array is peaked on local stereo frequency. High front-to-back ratio and clean polar diagram. 1in diameter aluminium crossbar.  $\frac{1}{2}$ in diameter elements. Waterproof junction box. Die-cast element clamps with aluminium securing bolts. Heavily plated universal clamp for masts 1in-2in diameter. For extreme range two FM4.S can be stacked one above the other (6 or 7ft apart) and connected together by PM/3 phasing and matching harness. Price: FM4.S aerial array £5; PM/3 harness £2.10

#### FM6.S

Band II broad-band long-range six-element aerial covering 88-98MHz. Array comprises dipole, reflector and four directors. Careful design for director chain provides clean polar diagram. For stacked arrays two FM6.S aerials can be connected together by PM/3 harness. Price: FM6.S aerial array £6.60; PM/3 harness £2.10.

### ■ K.V.A. ELECTRONICS

40 Monarch Parade, London Road, Mitcham,  
Surrey. Tel: 01-648 4884.

#### FML

Band II loft dipole. Two-screw fixing bracket, rotatable base, arms of dipole adjustable to V for optimum results or to clear obstructions. Price: 95p.

**FM.SD/W**

Band II wall-mounting single dipole with fixing bracket, stand-off arm and provision for swivelling aerial for optimum results. Price: £1-63.

**FML/H**

Band II loft-type H aerial comprising dipole, reflector, mounting boom and stand-off arm. Fixing bracket permits aerial to be orientated for best results. Price: £1-93.

**FML/Y3**

Band II three-element loft array comprising director, folded dipole and reflector with stand-off arm and fixing bracket. Particularly suitable in areas where signal strength is poor or where 'ghosting' causes distortion. Price: £3-12.

**FML/Y4**

Similar to FML/Y3 but with two directors. Price: £3-53.

**FM/HC**

Band II horizontally polarised outside H aerial comprising dipole, reflector, boom, cranked arm mast and chimney lashing equipment. Price: £3-85.

### ■ MAXVIEW AERIALS LTD

Maxview Works, Setch, King's Lynn, Norfolk.  
Tel: Watlington (Norfolk) 376.

**Maxview D/DW**

Band II wall-mounting dipole with stand-off arm and adjustable swivel fitting. Price: £2-04.

**Maxview D/DM**

Band II dipole array with bracket for mast fitting. Price: £1-75.

**Maxview D/HM**

Band II array comprising dipole and reflector on boom. Bracket for mast mounting. Price: £2-42.

**Maxview D/S3**

Band II three-element array comprising director, dipole and reflector. Bracket for mast mounting. Price: £2-80.

**Maxview D/FD3 ★**

Band II three-element array comprising director, folded dipole and reflector. Bracket for mast mounting. Price: £3-49.

**Maxview D/STB**

Band II Twig stub add-on units for TV aerials to boost Band II reception. Price: 64p.

### ■ TELEFIELD SALES

Freestone Road, St Philips, Bristol 2.  
Tel: Bristol 73456.

**S2**

Band II stub adaptors for attaching to existing Band I or Band III aerial. Price: 63p.

**D2/FM**

Band II outdoor single dipole with stand-off arm for wall, eaves or fascia mounting. Price: £1-35.

**H2/FM**

Band II dipole and reflector array. Price: £1-95.

**3FD2/FM**

Band II three-element array comprising director, folded dipole and reflector. Complete with clamp for mast attachment. Price: £2-85.

**4FD2/FM**

Band II four-element array comprising two directors, folded dipole and reflector. Complete with mast fixing clamp. Price: £3-50.

**6FD2/FM**

Band II six-element array comprising four directors, folded dipole and reflector. Recommended for stereo radio. Complete with mast fixing clamp. Price: £4-85.

**7FD2/FM**

Band II seven-element array comprising five directors, folded dipole and reflector. Specially recommended for fringe areas and for stereo radio. Complete with mast fixing clamp. Price: £5-50.

### ■ VISTA GAIN

Vista Gain Sales Co,  
123/124 Newgate Street, London, EC1A 7AA.  
Tel: 01-600 3030.

**K.2**

Band II indoor dipole. Heavily-plated three-step telescopic dipole adjustable for optimum results. Capacity coupled elements for complete safety. Heavy base. Supplied with three yards low-loss coaxial cable. Price: £2-55.

# Directory of Manufacturers

**Acos** See Cosmocord

**Acoustical Manufacturing Co Ltd**,  
St Peter's Road, Huntingdon Hunts.  
Tel: Huntingdon 2561/2.

**Acoustico Enterprises Ltd**, 6-8 Union  
Street, Kingston-on-Thames, Surrey.  
Tel: 01-549 3471/3.

**Acoustic Research** See Bell & Howell  
**ADC** See Hisonic

**Adastra Electronics Ltd**, Unit 22,  
Cricklewood Trading Estate,  
Claremont Road, London, NW21TU.  
Tel: 01-452 6288.

**AEG (Great Britain) Ltd**, AEG House,  
Chichester Rents, Chancery Lane,  
London, WC2. Tel: 01-242 9944.

**Aerialite Ltd**, Hargreaves Works,  
West Heath, Congleton, Cheshire.  
Tel: Congleton 3892.

**Agfa-Gevaert Ltd**, Unity House,  
Great West Road, Brentford, Middlesex.  
Tel: 01-560 2121.

**AKG Equipment Ltd**, 182-184 Campden  
Hill Road, Kensington, London, W8.  
Tel: 01-229 3695/6.

**Akai** See Rank Audio Products

**Alba (Radio & Television) Ltd**,  
Tabernaacle Street, London, EC2.  
Tel: 01-253 1322.

**Richard Allan Radio Ltd**, Bradford Road,  
Gomersal, Cleckheaton, Yorkshire.  
Tel: Cleckheaton 2442/3.

**Alpha** See Highgate Acoustics

**Altec Lansing** See LTV Ling Altec

**Amos of Exeter Ltd**, Weircliffe Court,  
Exwick, Exeter, Devon.  
Tel: Exter 72132.

**Ampex GB Ltd**, Acre Road, Reading,  
RG20QR. Tel: Reading 84411.

**Amplivox Ltd**, Beresford Avenue,  
Wembley, Middlesex. Tel: 01-902 8991.

**Amstrad Electronics Ltd**, 34 Great  
Sutton Street, London, EC1.  
Tel: 01-251 0241/2.

**Antiference Ltd**, Bicester Road,  
Aylesbury, Bucks. Tel: Aylesbury 2511.

**APAE** See Association of Public  
Address Engineers

**ARD** See Audio Research and  
Development

**Armstrong Audio Ltd**, Warlters Road,  
Holloway, London, N7. Tel: 01-607 3213.

**Associated Electronic Engineers Ltd**,  
Dalston Gardens, Stanmore, Middlesex.  
HA71BL. Tel: 01-204 2125.

**Association of Public Address Engineers**,  
394 Northolt Road, South Harrow,  
Middlesex. HA28EY. Tel: 01-864 3405/6.

**A.S. Techniques**, 35 Waterloo Street,  
Leicester. Tel: Leicester 26319.

**Astec** See A.S. Techniques

**Astronic** See Associated Electronic  
Engineers

**Audio Dynamics Corporation** See Hisonic

**Audio Developments** See B. H. Morris &  
Co.

**Audio-Technica** See Shriro

**Audio Research & Development Ltd**,  
PO Box 73, Hounslow, Middlesex.  
Tel: 01-570 0471.

**Audio Services Ltd**, 82 East Barnet Road,  
New Barnet, Herts. Tel: 01-449 6605.

**Audio Workshops Ltd**, 29 High Street,  
Robertsbridge, Sussex.  
Tel: Robertsbridge 580.

**Averine Electronics**, PO Box 6, Ruislip,  
Middlesex, HA48AT. Northwood 27790.

**Baker Reproducers Ltd**, Bensham Manor  
Road Passage, Thornton Heath, Surrey.  
Tel: 01-684 1665.

**Bang & Olufsen UK Division**,  
Eastbrook Road, Gloucester.  
Tel: Gloucester 21591.

**BASF United Kingdom Ltd**,  
Knightsbridge House, 197 Knightsbridge,  
London, SW7. Tel: 01-584 5080.

**F.W.O. Bauch Ltd**, 49 Theobald Street,  
Boreham Wood, Herts. Tel: 01-953 0091.

**Bell & Howell Ltd**, Audio Products  
Division, Alpertown House, Bridgewater  
Road, Alpertown, Middlesex HAO1EG.  
Tel: 01-902 8812

**Ben Nevis Aerials Ltd**, Belmont Works,  
Belmont Site, Lewis Street, Stranraer,  
Scotland. Tel: Stranraer 2677/8.

**BeyerDynamic (GB) Ltd**, 1 Clair Road,  
Haywards Heath, Sussex.  
Tel: Haywards Heath 51003.

**Bib** See Multicore Solders

**Black Knight Rumblecure**, Bank Top,  
Currier Lane, Ashton-under-Lyne,  
Lancs. Tel: 061-2836 and 330 3991.

**Boosey & Hawkes (Sales) Ltd**,  
Sonorous Works, Deansbrook Road,  
Edgware, Middlesex. Tel: 01-952 7711.

**Bosch Ltd**, Rhodes Way, Radlett Road,  
Watford, Herts. WD24LB.  
Tel: Watford 44233.

**Bose** See Expotus

**Bouyer** See Douglas A. Lyons and  
Associates

**Bradmatic Ltd**, 338 Aldridge Road,  
Streety, Sutton Coldfield, Warwickshire.  
Tel: 021-353 3171.

**Brenell Engineering Co Ltd**,  
231-5 Liverpool Road, London, N1.  
Tel: 01-607 8271.

**Brimham** See P. F. and A. R. Helme

**Britimpex Ltd**, 8-12 Rickett Street,  
London, SW6. Tel: 01-385 0883.

**British Radio Corporation Ltd**,  
284 Southbury Road, Enfield, Middlesex.  
Tel: 01-366 1155.

**British Radio Corporation Ltd**,  
Thorn House, Upper St Martins Lane,  
London, WC2. Tel: 01-836 2444.

**Bryan Amplifiers Ltd**,  
18 Greenacres Road, Oldham, Lancs.  
Tel: 061-624 4074.

**BSR Ltd**, Monarch Works,  
Cradley Heath, Warley, Worcs.  
Tel: Cradley Heath 69272.

**Burne-Jones & Co Ltd**,  
18 Brunswick Road, Sutton, Surrey.

**Bush** See Rank Bush Murphy

**Bush Nelson Ltd**, Bush House,  
6 Yattendon Road, Horley, Surrey.  
Tel: Horley 5983.

**B & W Electronics Ltd**,  
Littlehampton Road, Worthing, Sussex.  
Tel: Worthing 66830.

**Calder Recordings Ltd**, Regent Street,  
Hebden Bridge, Yorkshire.  
Tel: Hebden Bridge 2159.

**Calrec** See Calder Recordings

**Cambridge Audio Laboratories Ltd**,  
The River Mill, St Ives, Huntingdon.  
Tel: St Ives (Hunts) 2901.

**Carston Electronics Ltd**, 71 Oakley Road,  
Chinnor, Oxon. Tel: 0844 52061.

**Celestion** See Rola-Celestion

**Chart Edge Ltd**, 18-21  
Jernyn Street, London,  
SW1. Tel: 01-734 1443.

**Chilton** See Magnetic Tapes

**Cincoorder** See Murray Electronics

**City Audio Services Ltd**, 7 Chalcot Road,  
London, NW1. Tel: 01-586 3211/2.

**Clark** See Sonab

**Clendisc (Mail Order) Ltd**,  
7 Trinity Court, Gray's Inn Road,  
London, WC1. Tel: 01-837 9088.

**Col'on** See Musonic

**Connoisseur** See A. R. Sugden & Co.

**Contronics Ltd**, Garth Works,  
Deeputt Bridge Road, Blackdown,  
Camberley, Surrey. Tel: Deeputt 5936.

**Cosmocord Ltd**, Eleanor Cross Road,  
Waltham Cross, Herts.  
Tel: Waltham Cross 27331.

**Crown International** See Carston  
Electronics

**Crown Radio Ltd**, 128/9 Shoreditch  
High Street, London, E1.6JE.  
Tel: 01-739 2382.

**A. Davies & Co**, 56 Wellesley Road,  
London, NW5. Tel: 01-485 5775.

**Decca Record Co**, Decca House,  
9 Albert Embankment, London, SE1.  
Tel: 01-735 8111.

**Decca Special Products**, Ingate Place,  
Queenstown Road, London, SW8.  
Tel: 01-622 6677.

**Deimos Ltd**, Simmons Road, Wincheap,  
Canterbury, Kent. Tel: 68597.

**Denham & Morley (Overseas) Ltd**,  
453 Caledonian Road, London, N7.  
Tel: 01-607 6568.

**Deptford Cameras & Hi-Fi Design Centre**, 494 New Cross Road, London, SE14. Tel: 01-692 2981.

**Derwent** See Nicholas Acoustic Fitments

**Deutsche Grammophon (Great Britain) Ltd**, 12-13 Rathbone Place, London, W1. Tel: 01-499 8686.

**Dual Electronics Ltd**, St Georgen House, Mill Road, Stokenchurch, Bucks. Tel: Radnage 3467.

**Duette** See J.J. Silber

**Dynaco** See Howland-West

**Dynastatic** See Audio Services

**Dynatron Radio Ltd**, St Peter's Road, Maidenhead, Berks. Tel: Maidenhead 23331.

**Eagle International**, Heather Park Drive, Wembley HA1 1SU. Tel: 01-903 0144.

**Eaton Audio Fitments**, Leopold Street, Long Eaton, Nottingham, NG104QF. Tel: Long Eaton 2662 and 2818.

**Echo** See Adastra Electronics

**Ekco** See Pyc

**Elac** See Electro Acoustic Industries

**Electro Acoustic Industries Ltd**, Stamford Works, Broad Lane, Tottenham, London, N15. Tel: 01-808 0505.

**Elizabethan** See Lee Products

**EMI Electronics Ltd**, Television Equipment Division, Hayes, Middlesex. Tel: 01-573 3888.

**EMI Electronics Ltd**, Installation and Maintenance Division, Blyth Road, Hayes, Middlesex. Tel: 01-573 3888.

**EMI Records Ltd**, EMI House, 20 Manchester Square, London, W1. Tel: 01-486 4488.

**EMI Sound Products Ltd**, Component Division, Blyth Road, Hayes, Middlesex. Tel: 01-573 3888.

**EMI Tape Ltd**, Blyth Road, Hayes, Middlesex. Tel: 01-573 3888.

**Empire Scientific Corporation** See Rank Audio Products

**EMT Wilhelm Franz** See F. W. O. Bauch

**Euphonics** See A. C. Farnell

**Europa Electronics Ltd**, Howard Place, Shelton, Stoke-on-Trent, ST14NW. Tel: Stoke-on-Trent 29316.

**Eurovox Ltd**, The Power House, Headstone Lane, Harrow, Middlesex. Tel: Hatch End 1021/4.

**Expert Pickups Ltd**, PO Box No. 3, Ashstead, Surrey. Tel: Ashstead 73704.

**Expotus Ltd**, 10 Museum Street, London, WC1. Tel: 01-836 3747.

**FAL** See Futuristic Aids

**Falcon** See John Street

**Jonathan Fallowfield Ltd**, 56-60 St John Street, London, EC1. Tel: 01-253 7591.

**Fane Acoustics Ltd**, Hick Lane, Batley, Yorks. Tel: Batley 6431.

**Fantavox** See Lasky Radio

**A.C. Farnell Ltd**, Consumer Division, Farnell House, 81 Kirkstall Road, Leeds, LS3 1HR. Tel: Leeds 35111.

**Feldon Audio Ltd**, 126 Great Portland Street, London, W1N5PH. Tel: 01-580 4314.

**Ferguson** See British Radio Corporation

**Ferrodynamic International Ltd**, Leda Tapes (Despatch Dept), 17 Leigh Park Road, Leigh-on-Sea, Essex.

**Ferrograph Co Ltd**, The Hyde, Edgware Road, Colindale, London, NW9. Tel: 01-205 2241.

**Fidelity Radio Ltd**, 6 Olaf Street, London, W11. Tel: 01-727 0131.

**Film Industries Ltd**, Station Avenue, Kew Gardens, Surrey. Tel: 01-940 8078.

**J.J. Francis (Wood Green) Ltd**, 123 Alexandra Road, Hornsey, London, N8. Tel: 01-888 1662.

**A.R. Franklin (Audio Engineer)**, 4 Birch House, Penge, London, SE20. Tel: 01-659 0912.

**Futuristic Aids Ltd**, Henconner Lane, Leeds, 13. Tel: Pudsey 5478.

**Garrard Engineering Ltd**, Swindon, Wilts. Tel: Swindon 5381.

**GEC (Radio & Television) Ltd**, Langley Park, Slough, Bucks. Tel: Slough 22201.

**Golding Audio Ltd**, Marks Tey, Colchester, Essex. Tel: Colchester 210433.

**Golding Manufacturing Co (Great Britain) Ltd**, 10 Bayford Street, Hackney, London, E8 3SE. Tel: 01-985 1152.

**Goodmans Loudspeakers Ltd**, Downley Road, Havant, Hampshire P092NL. Tel: Havant 6344.

**Granpian Reproducers Ltd**, 19 Hanworth Trading Estate, Feltham, Middlesex. Tel: 01-894 9141.

**Grosvenor** See Kelgrove (Sales)

**Grundig (Great Britain) Ltd**, Hi-Fi Division, 15 Orchard Street, London, W1. Tel: 01-935 4898.

**Hacker Radio Ltd**, Norreys Drive, Cox Green, Maidenhead, Berks. Tel: Maidenhead 22261.

**G.F.C. Hadcock**, Audio Division, The Old Vicarage, Doveridge, Derby. DE65NN. Tel: Uttoxeter 2452.

**Halcyon** See Eurovox

**C.E. Hammond & Co Ltd**, Lamb House, Church Street, London, W4. Tel: 01-995 4551.

**Hampstead High Fidelity**, 91 Heath Street, Hampstead, London, NW3. Tel: 01-435 6377 and 0999.

**Hanimex (U.K.) Ltd**, Hanimex House, 15-24 Great Dover Street, London, SE1. Tel: 01-407 8161.

**Harman-Kardon** See Highgate Acoustics

**Harris & Russell Ltd**, 124-130 East Road, London, N1. Tel: 01-253 7551.

**Harwell Instruments**, 5-9 Anerley Station Road, London, SE20. Tel: 01-778 9456.

**Hayden Laboratories Ltd**, East House, Chiltern Avenue, Amersham, Bucks. Tel: Amersham 5511.

**Heath (Gloucester) Ltd**, Bristol Road, Gloucester. Tel: Gloucester 29451.

**Heathkit** See Heath (Gloucester)

**Heco** See Acoustico Enterprises

**Thomas Heinitz**, 35 Moscow Road, Queensway, London, W2. Tel: 01-229 2077.

**P.F. and A.R. Helme Ltd**, Summerbridge, Harrogate HG34DR. Tel: Darley 279.

**Henry's Radio Ltd**, 303 Edgware Road, London, W2. Tel: 01-723 1008/9.

**Highgate Acoustics Ltd**, 184-188 Great Portland Street, London, W1. Tel: 01-636 2901.

**Hirschmann** See Audio Workshops

**Hisonic Ltd**, Tovil, Maidstone, Kent. Tel: Maidstone 57258.

**Hitachi Sales (UK) Ltd**, Park House, Coronation Road, Park Royal, London, NW107QS. Tel: 01-965 9861.

**HMV** See British Radio Corporation

**Holder Pearce Ltd**, 66 Grove Road, Eastbourne, Sussex. Tel: Eastbourne 26565.

**John Horwitz**, 305 Kenton Road, Kenton, Harrow, Middlesex. Tel: 01-907 6667.

**Howland-West Ltd**, 2 Park End, South Hill Park, London, NW3. Tel: 01-794 6666/6033.

**IMF Products (GB)**, 62-68, Silver Street, Reading, Berks. Tel: Reading 861471.

**Imhofs Ltd**, 112-116, New Oxford Street, London, WC1. Tel: 01-636 7878.

**ITT-KB Consumer Products Division**, Foots Cray, Sidcup, Kent. Tel: 01-300 7733.

**ITT Components Group Europe**, Standard Telephones & Cables Ltd, Electro-Mechanical Product Division, West Road, Harlow, Essex. Tel: Harlow 26811.

**Japan Phono Motor** See Howland-West  
**J.Beam Engineering Ltd**, Rothersthorpe Crescent, Northampton, NN49JD. Tel: Northampton 63531/6.

**Jordan-Watts** See Boosey and Hawkes (Sales)

**Kampel Electronics Ltd**, 99 Old Christchurch Road, Bournemouth, Hampshire, BH1 1EP.

**KEF Electronics Ltd**, Tovil, Maidstone Kent. Tel: Maidstone 57258.

**Keltron** See Kelgrove (Sales)

**Kelgrove (Sales) Ltd**, 25 Roman Road, London, E2. Tel: 01-980 1936.

**Kellar Electronics Ltd**, Lopen Works, Lopen Road, Edmonton, London, N18.

**K.F. Products Ltd**, Brookfield House, Hopes Carr, Stockport, Cheshire. Tel: 061-480 7428.

**DIRECTORY OF MANUFACTURERS**

**Kingstereo** See Lionel Murray  
**Kirkman (Crawley) Ltd**,  
 40 The Broadway, Crawley, Sussex.  
 Tel: Crawley 26670.

**Klein and Hummel** See F.W.O. Bauch  
**Klinger Controls**, 7 Chalcot Centre,  
 Chalcot Road, London, NW1 8LU.  
 Tel: 01-586 2922/3.

**Korting** See Europa Electronics  
**Koss** See Tape Music Distributors

**KVA Electronics Ltd**,  
 40 Monarch Parade, London Road,  
 Mitcham, Surrey. Tel: 01-648 4884.

**James B. Lansing** See Feldon Audio  
**Large of Holborn**, 76-77 High Holborn,  
 London, WC1. Tel: 01-242 2626.

**Lasky's Radio Ltd**, 3-15 Cavell Street,  
 Tower Hamlets, London, E1 2BN.  
 Tel: 01-790 4821.

**Leak** See Rank Wharfedale

**Leda Tapes (Despatch Dept)**, 17 Leigh  
 Park Road, Leigh-on-Sea, Essex.

**Lee Products (Great Britain) Ltd**,  
 10-18 Clifton Street, London, EC2.  
 Tel: 01-247 1846.

**Leevers-Rich Equipment Ltd**,  
 319 Trinity Road, Wandsworth, London,  
 SW18. Tel: 01-874 9054/6.

**Lem** See Douglas A. Lyons and  
 Associates

**Lennard Developments Ltd**,  
 Lockfield Avenue, Brimsdown,  
 Middlesex. Tel: 01-804 8141.

**Lewis Audio** See Louis & Lewis  
 (Electronics)

**L & H** See Britimpex

**Ling Dynamic Systems Ltd**,  
 Royston, SG8 5BQ. Herts.  
 Tel: Royston 42424.

**LNB Audio Ltd**, 25 Cambridge Street,  
 Loughborough, Leicester.  
 Tel: Loughborough 61229.

**Lockwood & Co (Woodworkers) Ltd**,  
 63 Lowlands Road, Harrow, Middlesex.  
 Tel: 01-422 3704/0768.

**Louis & Lewis (Electronics) Ltd**,  
 154-155 High Street, Brentford,  
 Middlesex. Tel: 01-560 1160/1.

**Lowther Manufacturing Co Ltd**,  
 Lowther House, St Mark's Road,  
 Bromley, Kent, BR29HQ.  
 Tel: 01-460 5225.

**Lustraphone Ltd**, St George's Works,  
 Regents Park Road, London, NW1.  
 Tel: 01-722 8844.

**Lux** See Howland-West

**Luxitone Ltd**, 84 Bolsover Street,  
 London, W1. Tel: 01-636 2901.

**Laxor** See Luxitone

**Douglas A. Lyons & Associates Ltd**,  
 8 Rycotes Mead, Dulwich, London,  
 SE21. Tel: 01-693 2855.

**Magnetic Tapes Ltd**, Chilton Works,  
 Garden Road, Richmond, Surrey.  
 Tel: 01-876 7957.

**Marconiphone** See British Radio  
 Corporation

**Martin Audiokits**, 154 High Street,  
 Brentford, Middlesex.  
 Tel: 01-560 1161.

**Mastertape (Magnetic) Ltd**,  
 Blackthorne Road, Poyle Trading  
 Estate, Colnbrook, Near Slough, Bucks,  
 SL3 0AQ. Tel: Colnbrook 2431.

**Maxell** See Harris and Russell

**Maxview Aerials Ltd**, Maxview Works,  
 Setch, King's Lynn, Norfolk. Tel:  
 Watlington (Norfolk) 376.

**Melodium** See Keith Monks (Audio)

**Metrosound Audio Products Ltd**,  
 Cartersfield Road, Waltham Abbey,  
 Essex. Tel: Waltham Cross 31933.

**Edward Michelsen Custom Cabinets**,  
 153 Plumstead Road, London, SE18.  
 Tel: 01-854 2369.

**Micro-Seiki** See B. H. Morris (Radio)

**Millbank Electronics Ltd**, The Square,  
 Forest Row, Sussex.  
 Tel: Forest Row 2288.

**Minnesota Mining & Manufacturing Ltd**,  
 3M House, Wigmore Street, London,  
 W1. Tel: 01-486 5222.

**MMG Associates Ltd**, 8 Watford Heath  
 Farm, Oxhey, Watford, Herts, WD1 4ER.  
 Tel: Watford 21754.

**Keith Monks (Audio) Ltd**, 5 Fleet Road,  
 Fleet, Aldershot, Hants. Tel: Fleet 7316.

**Mordaunt-Short Ltd**, The Courtyard,  
 Heath Road, Petersfield, Hampshire.  
 Tel: Petersfield 4761.

**B.H. Morris & Co (Radio) Ltd**,  
 84-88 Nelson Street, Tower Hamlets,  
 London, E1. Tel: 01-790 4824.

**Motion Electronics Ltd**, Addestone Farm,  
 Tónbridge Road, East Peckham, Kent.  
 Tel: East Peckham 354.

**Mullard Ltd**, Mullard House,  
 Torrington Place, London, WC1.  
 Tel: 01-580 6633.

**Multicore Solders Ltd**, Maylands Avenue,  
 Hemel Hempstead, Herts.  
 Tel: Hemel Hempstead 3636.

**Murray Electronics Ltd**, 5 Selkirk Road,  
 Tooting, London, SW17.  
 Tel: 01-672 8267.

**Lionel Murray Ltd**, 7 West Halkin Street,  
 Belgrave Square, London, SW1.  
 Tel: 01-235 6424/6.

**Muscraft Audio Products Ltd**,  
 63 High Street, Hounslow, Middlesex.  
 Tel: 01-570 4640.

**Musonik Ltd**, 34-38 Verulam Road,  
 St Albans, Herts.  
 Tel: St Albans 50611/2.

**Nagra** See Hayden Laboratories

**National Panasonic** See Unamec

**Neat Corporation** See Howland-West  
**Neumann GMBH** See F. W. O. Bauch

**Nichols Acoustic Fittings**, Church Street,  
 Bubwith, Near Selby, Yorkshire.  
 Tel: Bubwith 206.

**Nikko** See Howland-West

**Nivico** See Denham and Morley  
 (Overseas)

**Nordmende** See TAK Continental  
 Importers

**Onkyo** See J. Parkar & Co (London)

**Orbit** See Highgate Acoustics

**Ortofon** See Metrosound (Sales)

**Osmabet Ltd**, 46 Kenilworth Road,  
 Edgware, Middlesex. Tel: 01-958 9314.

**Pageantry Radio & TV Co Ltd**,  
 104 Felsham Road, Putney, SW15.  
 Tel: 01-788 5588.

**J. Parkar & Co (London) Ltd**,  
 Parkar House, 1 Paul Street, London,  
 EC2. Tel: 01-628 4577.

**Peak Sound (Harrow) Ltd**,  
 32 St Judes Road, Englefield Green,  
 Egham, Surrey. Tel: Egham 5316.

**Pearl** See Audio Workshops

**Peerless** See P. F. and A. R. Helme

**Perpetuum-Ebner** See Highgate Acoustics

**Philco-Ford** See Philco-International

**Philco-International Ltd**,  
 42 Leicester Square, London,  
 WC2H 7LR. Tel: 01-930 7667.

**Philips Electrical Ltd**, Century House,  
 Shaftesbury Avenue, London, WC2.  
 Tel: 01-437 7777.

**Pickering** See Highgate Acoustics

**Pioneer** See Shiro

**Planet Projects Ltd**, Goodmans Works,  
 Belvue Road, Northolt, Middlesex.  
 Tel: 01-845 1775.

**Playfair** See Lennard Developments

**Polyord Records Ltd**, 17-19 Stratford  
 Place, London, W1. Tel: 01-493 7401.

**Pye Business Communications Ltd**,  
 Orchard Road, Royston, Herts.  
 Tel: Royston 44141.

**Pye Ltd**, PO Box 49, St Andrews Road,  
 Cambridge. Tel: Cambridge 58985.

**Quad** See Acoustical Manufacturing

**Radford Audio Ltd**, Ashton Vale Road,  
 Bristol BS3 2HZ. Tel: Bristol 662301.

**Radio & Electronic Distribution Co**,  
 55-63 Goswell Road, London, EC1.  
 Tel: 01-253 1802.

**Radon Industrial Electronics Co Ltd**,  
 Brooklands Trading Estate, Orme Road,  
 Worthing, Sussex. Tel: Worthing 34904.

**Rank Audio Products**, PO Box 70,  
 Great West Road, Brentford, Middlesex.  
 Tel: 01-568 9222.

**Rank Bush Murphy Ltd**, Power Road,  
 Chiswick, London, W4.  
 Tel: 01-994 6491.

**Rank Wharfedale Ltd**, Bradford Road, Idle, Bradford BD1085Q.  
Tel: Bradford 612552.

**Record Housing Ltd**, Brook Road, London, N22. Tel: 01-888 7487.

**Rectavox Co**, Central Buildings, Wallsend, Northumberland.  
Tel: Wallsend 624845.

**Reps (Tape Recorders) Ltd**, 11-13 Regina Road, Southall, Middlesex. Tel: 01-574 3645.

**Resolound Ltd**, Spring Gardens, London Road, Romford, Essex.  
Tel: Romford 61926.

**Revox** See C. E. Hammond

**RGD** See ITT-KB

**Richardson Electronics Ltd**, 57 Jamestown Road, London, NW1.  
Tel: 01-267 0723.

**Rogers Developments (Electronics) Ltd**, 4-14, Barmeston Road, Catford, London, SE6. Tel: 01-698 7424 and 4340.

**Rola-Celestion Ltd**, Ditton Works, Foxhall Road, Ipswich, Suffolk, IP38JP. Tel: Ipswich 73131.

**Rota** See Kelgroe (Sales)

**Rotel** See Rank Audio Products

**Sansui** See Vernitron

**Sanyo Marubeni**, Sanyo House, Bushey Mill Lane, Watford, Herts.  
Tel: Watford 25354/6.

**Scan-Dyna** See Howland-West

**Schweizer** See Highgate Acoustics

**Scopetronics Ltd**, Crown Works, Church Road, Kingston-upon-Thames, Surrey. Tel: 01-546 1275 and 4135.

**Scotch** See Minnesota Mining and Manufacturing

**Sennheiser Electronics** See Hayden Laboratories

**Sharp Electronics (U.K.) Ltd**, 48 Derby Street, Manchester, M88HN.  
Tel: 061-832 6115.

**Sharpe Instruments** See Carston Electronics

**Sheppard Audio Ltd**, 31 Newberries Parade, Radlett, Herts.  
Tel: Radlett 5440.

**Shrivo (UK) Ltd**, 42 Russell Square, London, WC1B5DF. Tel: 01-580 6996.

**Shure Electronics Ltd**, 84 Blackfriars Road, London, SE1.  
Tel: 01-928 3424.

**J.J. Silber Ltd**, 11 Northburgh Street, London, EC1. Tel: 01-253 8031.

**Sinclair Radionics**, London Road, St Ives, Huntingdonshire, PE174HJ.  
Tel: St Ives (Hunts) 4311.

**Skandi a Electronics** See Golding Audio S.M.E. Ltd, Steyning, Sussex BN43LN.  
Tel: Steyning 2228.

**Sonab Ltd**, 136 Mansfield Road, Acton, London, W3. Tel: 01-993 0849.

**Sonics** See B. H. Morris & Co.

**Sonotone** See Vernitron

**Sony (UK) Ltd**, Pyrene House, Sunbury Cross, Sunbury-on-Thames.  
Tel: Sunbury-on-Thames 87644/7.

**Soundex Ltd**, 18 Blenheim Road, London, W4. Tel: 01-995 1661.

**The Sound Studio Ltd**, 33-35 Camden Road, Tunbridge Wells, Kent. Tel: 32153.

**Standard** See Telerenters (London & Provincial)

**Staples & Co Ltd**, Staples Corner, Junction Edgware Road and North Circular Road, London, NW2.  
Tel: 01-452 1144/8.

**Stax** See Wilmix

**Ste-Ma** See Kelgroe (Sales)

**Stentorian** See Whiteley Electrical Radio

**John Street (Manufacturers) Ltd**, Falcon Works, Barmeston Road, Catford SE6. Tel: 01-698 1177.

**Studer** See F. W. O. Bauch

**A.R. Sugden & Co (Engineering) Ltd**, Market Street, Brighouse, Yorkshire.  
Tel: Brighouse 2142.

**J.E. Sugden & Co Ltd**, Bradford Road, Cleckheaton, Yorks.  
Tel: Cleckheaton 2501.

**Synchrotape** See Adastra Electronics

**TAK Continental Importers**, 16a High Street, Stone, Staffordshire.  
Tel: Stone 3232/3.

**Tandberg** See Farnell-Tandberg

**Tannoy Products Ltd**, West Norwood, London, SE27. Tel: 01-670 1131.

**Tape 70** See Leda Tapes

**Tape Music Distributors Ltd**, 11 Redvers Road, London, N22.  
Tel: 01-888 0152.

**Tape Recorder Developments Ltd**, Hall Lane, Walsall Wood, Staffs.  
Tel: Brownhills 5351.

**Tape Recorder Spares Ltd**, Harmsworth House, 9 Harmsworth Street, London, SE17.  
Tel: 01-735 9683.

**Teac** See Lasky's Radio

**Telefilm Sales**, Freestone Road, St Philips, Bristol 2. Tel: Bristol 73456.

**Telefunken** See AEG (Great Britain)

**Telerenters (London & Provincial) Ltd**, Standard House, 1-2 Church Way, Edgware, Middlesex. Tel: 01-952 7488.

**Teleton Electro (Distributors) Ltd**, Teleton House, Robjohns Road, Widford, Chelmsford, Essex.  
Tel: Chelmsford 62442.

**Thorens** See Metrosound Audio Products

**Tonemaster** See Chart Edge

**Toshiba** See Hanimex (UK)

**Transcriptors Ltd**, 2 Theobald Street, Boreham Wood, Herts. Tel: 01-953 0771.

**Trio** See B. H. Morris & Co (Radio)

**Tripletone Manufacturing Co**, Factory No. 1, 138 Kingston Road, Wimbledon, SW19. Tel: 01-542 1189.

**Turner** See Millbank Electronics

**Tutchings Electronics Ltd**, 14 Rook Hill Road, Friars Cliff, Christchurch, Hants.  
Tel: Highcliff 2019.

**Tyson's**, 41 Russell Street, Leamington Spa.  
Tel: Leamington Spa 24935.

**Uher** See Bosch

**Unamed Ltd**, PO Box 1, United Africa House, Blackfriars Road, London, SE1. Tel: 01-928 2070.

**Unimixer** See Soundex

**Valradio Ltd**, Browells Lane, Feltham, Middlesex. Tel: 01-890 4837 and 4242.

**Van der Molen Ltd**, 1 Mildmay Road, Romford, Essex. RM7 7DA.  
Tel: Romford 41904.

**Vernitron Ltd**, Thornhill, Southampton. SO95QF.  
Tel: Southampton 44811.

**Vero Electronics Ltd**, Industrial Estate, Chandler's Ford, Eastleigh, Hants, SO53ZR.  
Tel: Chandler's Ford 2952.

**Videoton** See Radio & Electronic Distribution Co.

**Vista Gain Sales Ltd**, 123-4 Newgate Street, London, EC1A 7AA. Tel: 01-600 3030.

**Vitavox Ltd**, Westmoreland Road, London, NW99RJ. Tel: 01-204 4234.

**Vortexion Ltd**, 257-263 The Broadway, Wimbledon, London, SW19 1SF.  
Tel: 01-542 6242/4.

**Wal** See A. C. Farnell

**Cecil E. Watts Ltd**, Darby House, Sunbury-on-Thames, Middlesex.  
Tel: Sunbury-on-Thames 3252.

**Wharfedale** See Rank Wharfedale

**Whiteley Electrical Radio Co Ltd**, Radio Works, Victoria Street, Mansfield, Notts. Tel: Mansfield 24762.

**Wilmex Ltd**, Stax Division, 24-26 Ensign Street, London, E1.  
Tel: 01-949 2545.

**Wilson Stereo Library Ltd**, 104-106 Norwood High Street, London, SE27. Tel: 01-670 6394.

**L.G. Woollett & Co Ltd**, 21 Anerley Station Road, London, SE20.  
Tel: 01-778 9003.

**Worden Audio Developments Ltd**, 54 Chepstow Road, London, W2.  
Tel: 01-229 4996.

**Wye Electronics Ltd**, Queen Street North, Chesterfield, Derbyshire.  
Tel: Chesterfield 51116.

**Yamaha** See Jonathan Fallowfield

**Zonal Films (Magnetic Coatings) Ltd**, Holmesthorpe Avenue, Redhill, Surrey.  
Tel: Redhill 67171.

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- 3** *A minimum of twelve months service guarantee providing for free labour in addition to the manufacturers component guarantee. This will also be available to the purchaser if he moves house and takes the equipment into the service area of another member who is an agent for the make concerned.*

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# Directory of Hi Fi Dealers

## IMPORTANT NOTE

The following list is of shops where stocks of equipment are kept, and where facilities for demonstration exist. It is not necessarily a complete list, and we invite new dealers to submit details for future publications.

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### AUDIO T

Dryden Chambers, 119 Oxford Street, W1A 3DA

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### DAVIS & KAYS LTD

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61 Seven Sisters Road, N7

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494 New Cross Road, SE14

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123 Alexandra Road, Hornsey, N8

### FRANCIS OF STREATHAM

169-173 Streatham High Road, SW16

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7 The Broadway, Wood Green, N22 6DU

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14 Exmouth Market, EC1R 4QH  
86-88 Pentonville Road, N1 9HS  
172 Caledonian Road, N1 0SQ

### HAMPSTEAD HIGH FIDELITY

91 Heath Street, Hampstead, NW3

### H. C. HARRIDGE LTD

8 Moore Street, Cambridge Circus, W1

### HAVEN HI-FI (EALING) LTD

196-198 South Ealing Road, W5

### HEATH LTD

233 Tottenham Court Road, W1

### THOMAS HEINITZ

35 Moscow Road, W2 4AH

### HENRY'S RADIO LTD

303-309 Edgware Road, W2  
354-356 Edgware Road, W2

### HERMLYN HI-FI

230 High Street, Eitham, SE9

### ALFRED IMHOF LTD

112-116 New Oxford Street, WC1A 1HJ

### KINGSONS

2 Brownhill Road, SE6

### LASKY'S RADIO LTD

42-45 Tottenham Court Road, W1  
118 Edgware Road, W2  
152-153 Fleet Street, EC4  
109 Fleet Street, EC4

### LEE ELECTRONICS

400 Edgware Road, W2

### LEWIS RADIO COMPANY

100 Chaseside, Southgate, N14

### LIND-AIR AUDIO

18-19 and 25 Tottenham Court Road, W1

### MAC'S CAMERA SHOPS LTD

250-252 King Street, Hammersmith, W6

### MARBLE ARCH SOUND CENTRE

38 Edgware Road, W2

### EDWARD MICHELSEN CUSTOM

### CABINETS

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### MODERN ELECTRICS LTD

120 Shaftesbury Avenue, W1

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56 Crystal Palace Park Road, Sydenham, SE26

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### & TELEVISION CO

82 St John's Wood High Street, NW8 7SH

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### LTD

305 Romford Road, Forest Gate, E7

### NUSOUND HI-FI & TAPE

### RECORDER CENTRES

24 Oxford Street, W1

82 High Holborn, WC1

242-244 Pentonville Road, N1

228 Bishopsgate, EC2

36 Lewisham High Street, SE13

### M. O'BRIEN (HI-FI CASH

### DISCOUNT)

226 Worples Road, SW20

### PIERCYS ELECTRONICS LTD

58-62 Lupus Street, Piccadilly, SW1

### PREMIER RADIO (CANONDELL)

### LTD

23 Tottenham Court Road, W1

### THE RECORDER CO

186-188 West End Lane, West Hampstead, NW6

### R. E. W. AUDIO VISUAL CO

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### R. O. C. ELECTRONICS LTD

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34 Lisle Street, WC2

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### H. L. SMITH & CO LTD

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48 London Wall, EC2

115 Kingsway, Holborn, WC2

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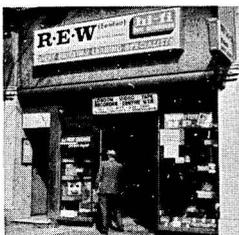
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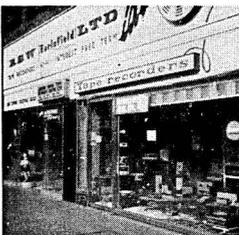
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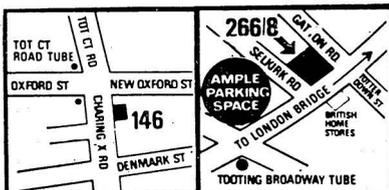
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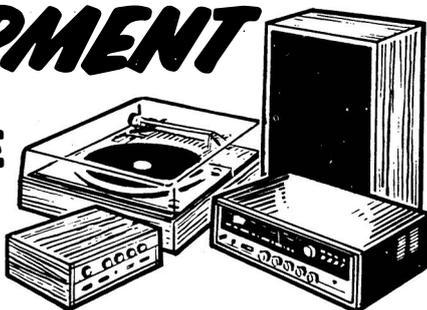
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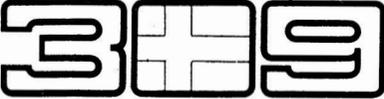
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