

NOVEMBER 1969

TAPE

RECORDING MAGAZINE

2'6



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About this tone control, 'Audio Record Review' said: "It is a definite plus feature as it provides something by way of sonic control which is not normally available to the listener." They also said that "The

frequency response was found to be rather superior to the printed specifications" and claimed 23 HZ to 14.2 KHZ instead of 25HZ to 13 KHZ.

The 'Audio Record Review' noted that "Any enthusiast seeking

to experiment with stereo headset listening would be well advised to make an effort to hear the Akai ASE-9S stereo headphones." So we didn't say it, they did. Your dealer can arrange a demonstration.

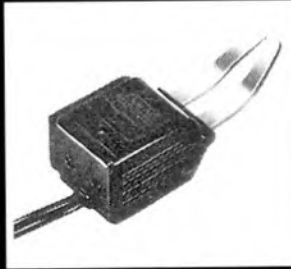
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Philips 4404...	26 17 0	4 5 0	77 17 0
Ferguson 3232	33 5 0	5 1 10	93 5 0
Sony MR-929	33 4 9	5 6 10	97 4 9
Sony TC260...	33 0 0	5 10 0	99 0 0
Philips 4407...	35 15 10	5 13 4	103 15 4
Akai I710W	37 15 7	6 2 1	111 0 5
Sony MR939	38 13 6	6 2 3	112 0 2
Telefunken 204TS...	41 13 0	6 18 10	124 19 0
Grundig TK247	45 10 9	7 2 4	130 18 9
Philips 4408...	46 19 5	7 8 9	136 3 10
Sony TC530	49 12 3	8 1 8	146 12 3
Beocord 2000K	53 5 0	8 17 6	159 15 0
Beocord 2000T	55 5 0	9 4 2	165 15 0
National Console-Aire	61 16 8	10 5 4	185 0 0
Ferrograph 722/4...	65 3 1	10 15 0	194 3 1
Akai M9	68 12 4	10 16 8	198 12 4

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Fidelity Braemar...	11 12 8	1 17 4	34 4 8
Ferguson 3226	15 9 0	2 11 7	46 6 0
Grundig TK140	16 10 1	2 11 11	47 13 1
Philips 4307	16 15 3	2 13 1	48 11 11
Ferguson 3238	20 12 0	3 5 0	59 12 0
Ferguson 3216	22 16 0	3 12 2	66 2 0
Wyndor Vanguard	25 4 0	4 4 0	75 12 0
Tandberg 1541	26 15 3	4 10 0	80 15 3
Reps HW10 4-T	28 16 9	4 11 2	83 10 1

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Sony TC355...	33 7 6	5 11 3	100 2 6
Akai 3000D...	35 0 3	5 10 7	101 6 11
Beocord 1500	42 15 0	6 18 4	125 15 0
Ferrograph 702/704	58 8 5	9 11 8	173 8 5

MAINS TWIN TRACK

Fidelity Braemar...	10 9 8	1 15 0	31 9 0
Ferguson 3224	11 12 8	1 16 10	33 14 0
Grundig TK120	14 0 3	2 3 9	40 5 3
Beocord 1100	28 5 0	4 14 2	84 15 0
Brenell Mk. V/3 Std.	36 8 2	5 16 7	106 16 8
Brenell Mk. V/3 Mtr.	39 8 3	6 4 6	114 1 9
Ferrograph 713	51 6 3	8 10 0	153 6 3
Ferrograph 713H...	53 14 6	8 17 6	160 4 6

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Philips 3302 Cassette	11 1 7	1 15 0	32 1 7
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Sony TC210...	16 0 0	2 13 4	48 0 0
Telefunken 301	17 17 0	2 19 6	53 11 0
Telefunken 302	19 12 0	3 5 4	58 16 0
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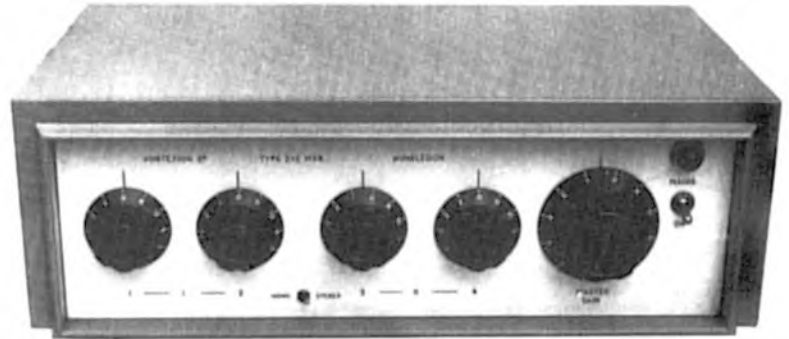
STEREO MIXERS

These electronic Stereo Mixers range from 2+2 to 5+5 input channels, with left and right outputs at 500 millivolts into 20K ohms up to infinity.

Separate control knobs are provided for L & R signals on each stereo channel so that a Mono/Stereo changeover switch provided can give from four to ten channels for monaural operation, in which state the L & R outputs provide identical signals.

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The units are mains powered and have the same overall dimensions as monaural mixers.



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6 Way Monaural Mixers	4 Way Monaural Mixers with P.P.M.
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10 Way Monaural Mixers	8 Way Monaural Mixers with P.P.M.

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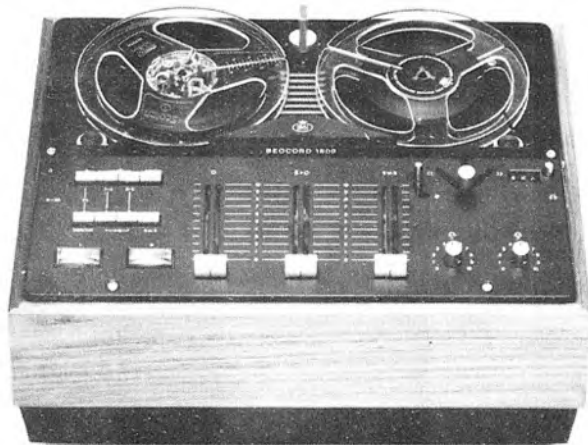
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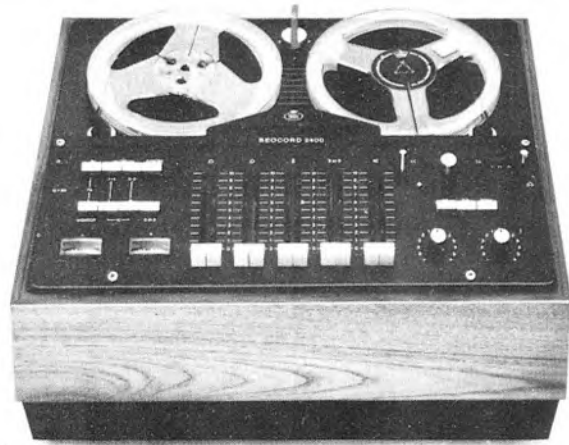
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Two brilliant new additions to the Beocord range



BEOCORD 1800



BEOCORD 2400

Made by Bang & Olufsen for those who consider design and quality before price.

Whether you prefer to centre your High Fidelity system around a separate amplifier, or to base it on an amplifier integrated into one of the audio units, your needs for a tape recorder to complete your system can be satisfied by choosing one of these new Beocords. Both machines exceed the minimum requirements for DIN 45.500, and have operational facilities comprehensive enough to attract the semi-professional as well as the domestic user. These include a 3 digit tape counter with push button

The Beocord 1800 – designed for use with a High Fidelity amplifier such as the Beolab 5000 or Beomaster 1400.

Available in 2 versions: (a) $\frac{1}{2}$ track record and replay with extra switched $\frac{1}{4}$ track replay head, (b) $\frac{1}{4}$ track record and replay only. Sockets duplicated in DIN and phono type to simplify connection. Special amplifier and volume control for output to headphone sockets.

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THE MAGNIFICENT WORLD



Model 1710L

Recommended Retail Price £109 0 0

MIGNON STEREO TAPE RECORDER—1710L

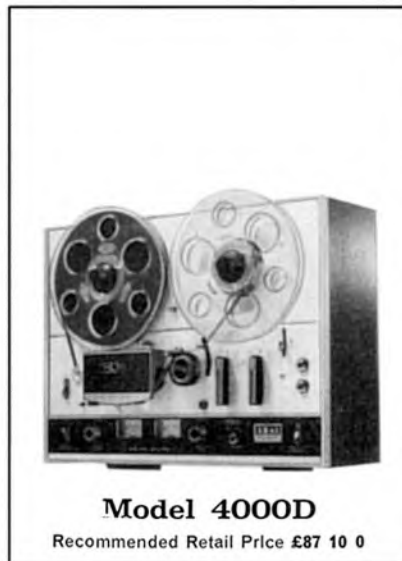
*4 track stereo/monaural recording and playback *3 speeds *Automatic shut off *Pause lever *Tape cleaner *Tape lifter in fast forward/rewind operation *4 hours maximum stereo recording capacity with a 1,200 feet tape *Beautiful black vinyl leather cabinet *For increased stereo enjoyment, use the matching high compliance speaker SW-50.

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*4 track stereo/monaural recording and playback *2 speeds, 3 heads *All silicon transistorized pre-amplifier *Automatic shut off, instant stop control *Tape cleaner *ONE MICRON GAP HEAD *Magnificent oil-finished wooden cabinet *For increased stereo enjoyment, use the matching AA-6000, 120 watt solid state amplifier and the matching speaker SW-130 (2 way, 25 watt input).

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Model 4000D

Recommended Retail Price £87 10 0



Model X-1800SD

Recommended Retail Price £199 0 0

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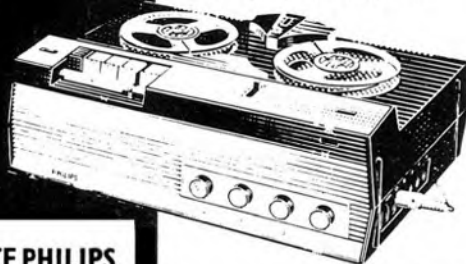
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OUR PRICE **22**^{GNS}
LIST PRICE **£28.7.0**

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TAPE

RECORDING
MAGAZINE

Incorporating TAPE RECORDING & HI-FI MAGAZINE
and STEREO SOUND MAGAZINE

Vol. 13 No. 11 November 1969

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COVER PHOTOGRAPH: Our illustration this month portrays the close alliance between sound recording and photography. Here we see the first Compact Cassette machine to be developed as a combined record/playback mechanism with the addition of a separate track for impulse control of a slide projector or similar apparatus.

Designed and manufactured by a British firm, Van Der Molen Ltd. of Romford, Essex, the sole distributor is ITT IVAC of Edinburgh Way, Harlow, Essex. Designated the Van Der Molen Autoslide the unit can not only change the slides when coupled to an automatic projector but can also start, stop and change direction of one or more auxiliary appliances. The Autoslide is being marketed by International Visual Aids Centre in conjunction with their vast library of slides covering a wide range of subjects.

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Tape trends and tape talk

By Douglas Brown

A MAJOR ADVANCE in tape technology earlier this year will produce direct benefits for the tape recording amateur within a year. Thus increases the pace of progress. In this column last May I reported that Du Pont de Nemours had come up with an entirely new process, using a base of chromium dioxide (instead of the familiar iron oxide) to produce Crolyn. And Crolyn, I suggested, would have dramatic effects on the market for computer tape because it was possible to pack much more information on a given area than with orthodox magnetic tape.

I did not anticipate at that time that the domestic user of tape would be affected within the foreseeable future. But now I hear that Musicassettes appearing early in 1970 will be recorded on Crolyn tape. This development is of the greatest significance. The fact that chromium dioxide tape with its capability for holding audio signals up to some 16,000 or 17,000 Hz. at $1\frac{7}{8}$ ips is finding its first domestic application in the field of pre-recorded music emphasises the seriousness with which this market is now being developed.

My original information indicated the possibility that the new wonder-tape might cost as much as 50 per cent more than the iron oxide tape we now use. For this reason it was then suggested that it would be unlikely to find its way into the hands of the amateur. So far I do not have any reports from tape manufacturers of proposals to market chromium dioxide tape as virgin material for home recording. If its advantages as a recording medium for Musicassettes are proven—as I have no doubt they will be—it is difficult to imagine how tape manufacturers will be able to ignore the new formula for very long. If chromium dioxide tape lives up to our expectations it could solve once and for all the problem of achieving high frequency response at slow tape speeds whether on cassette or open spool equipment.

The last big problem will be for the mechanical engineers to improve speed stability. A move in this direction has already been made by Brenell Engineering Ltd. who with their newest equipment claim an RMS wow and flutter figure of 0.12 per cent at $1\frac{7}{8}$ ips. So it looks as if the advent of true high fidelity sound reproduction at slow tape speeds is very close indeed.

* * *

ANOTHER COMING DEVELOPMENT: E.M.I. are expected to market in Britain before the end of the year eight-track stereo "cartridges," presumably to the American R.C.A. standard. And we have already reported on the "Packette" cassette devised by Tape Systems Ltd.

So we are not to have a single standard for tape "cassettes" after all! After the unsuccessful Grundig

effort to challenge the Philips cassette, I had expected we might settle for one type.

* * *

THE VIDEOTAPE RECORDER is now a familiar feature of advertising agencies as well as TV studios and I see that Ampex is making a push to extend its use in the communications industry. In a new advertising campaign in the trade press Ampex is pushing three recorders, costing £856, £1,510 and £4,650. The expensive model offers electronic editing, so that sequences from various tapes can be assembled together.

It is all so easily taken for granted now, but how recently and how rapidly the development to this point has taken place.

* * *

FROM the December issue *TAPE Recording Magazine* will show a change of face.

Firstly, there will be a new printing method; we shall print by the lithographic instead of the letterpress process. This will enable us to use some colour on our inside pages, to enliven both advertisements and editorial features. It will permit the use of more illustrations, and better reproduction of them.

Incidentally, the new printing technique includes text-setting on an IBM computerised installation which uses magnetic tape. When copy is set, in addition to characters being printed on a sheet of paper (as with a typewriter), to enable checking, information is recorded on a tape. Any corrections are then made and recorded on a separate "correction tape." The two tapes are then played back together. The computer "reads" their stored information in advance, merges corrected lines into the original setting as required and also letter-spaces the text to obtain justification (i.e., lines of equal length).

The second feature of our coming changes will be a conscious change of emphasis in editorial policy. While catering, as always, for the keen enthusiast who has graduated to various specialised forms of creative recording, we shall try to appeal to the new generation of youngsters who do not regard the tape recorder as a novelty, but as the natural means of reproducing music. We shall keep our readers very fully informed about new issues of music on tape—a service which we have been alone in offering during the last couple of years and which we shall now develop—and we shall endeavour to stimulate their interest so that they graduate from the playing of music to the making of tapes.

There will be more articles of every kind for the novice newcomer to tape and presentation, as well as subject-matter, will, we hope, be more lively. We shall welcome readers' reactions in due course.

IT'S ILLEGAL— BUT IS IT IMMORAL?

DO you observe the law? In every respect? Most of us do for most of the time, but there can be few— if any— recording enthusiasts who could place their hands on their hearts and swear they have never committed an illegal act. The restrictions imposed by legislation governing copyright make sure of that. But there are subtle distinctions between acts which one knows very well are “wrong,” such as stealing an old lady’s purse, and acts which we honestly believe to be “right,” such as copying one of our own gramophone records on to tape. Both are offences against the law of the land and the fact that the law is known to be an ass makes not the slightest difference. Not legally, anyway.

However, surely one can look at these problems from the moral, rather than the legal, point of view? And if it should be found that the law contradicts what the vast majority of people believe then the law should be changed. It’s as simple as that.

The law of copyright exists for one very good reason, and that is to protect the interests of creative people who earn money by producing works in the very wide artistic field. Authors, composers, playwrights, musicians, poets, film-makers and a whole host of others have as much right to legal protection as bankers, manufacturers and the shopkeepers in the High Street. In so far as the law of copyright performs this function it deserves wholehearted support.

But unfortunately it doesn’t stop there. The man who buys a gramophone record probably believes he owns it in the same way as he owns all the other things he buys. He does not. His ownership is restricted to the material from which the record is made; the programme carried in the groove remains the property of the record company and the purchaser is entitled to use it only for his own private entertainment. In the days before magnetic recording it meant that the record could not be used for public performance or broadcasting and the ordinary owner was rarely troubled at all. The situation today



Harmless hi-fi or a nefarious copyist’s den?

is very different. Tape recorders have brought the ability to copy, and this has scared the gramophone companies to death.

The cause of their concern is based on the theory that every time a record is copied on to tape a potential sale has been lost, and at first sight their argument might appear to have some validity. When Mr. X buys a record the price he pays includes not only the various profit margins for retailer, wholesaler and manufacturer, but also royalty fees for the composer and possibly performers as well. If Mr. X now allows six of his friends to copy that record on to tape it is reasoned that six sales have been lost and the creative artists will have been literally robbed of six fees. As clearly a case of stealing as is the robbing of elderly ladies and equally indefensible.

But is this what really happens? Do people really acquire libraries of “stolen” music in this way? Is the sale of a record really lost when it is copied? Negative answers to these questions can only mean that the prohibition against copying is pointless. Apart from which a law which cannot be enforced is both futile and bad legislation.

A great deal of the copying of records is done by the purchasers of those records for their own convenience. Aware of the many advantages of tape over disc as a medium of reproduction, why should the owner of a collection of records not transfer them to tape if he wishes? The proper price has been paid, profits have been earned and the artistes have been remunerated. No money has been lost by anyone. It’s illegal, but is it immoral? There can be no possible doubt about the answer to that one. It is intolerable that the private individual should be placed in a position where he breaks the law in this singularly harmless manner.

But there are other arguments against this absurdly reactionary attitude of the record companies against copying. Much as they might hate to admit it, a powerful factor in the sale of a commercial record is the design on the sleeve rather than the programme inside. A good record in a thoroughly bad sleeve is always a poor seller. Much of the attraction of a record library lies in the gaily coloured covers and the information printed on the back. A taped copy is no substitute. Just a plain box. No pictures, no notes, no names of

Please turn to page 369

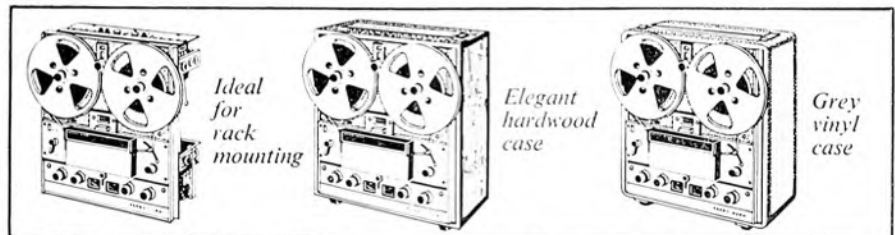
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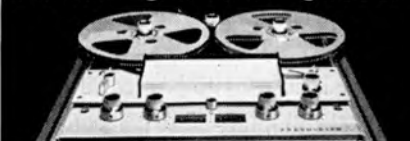
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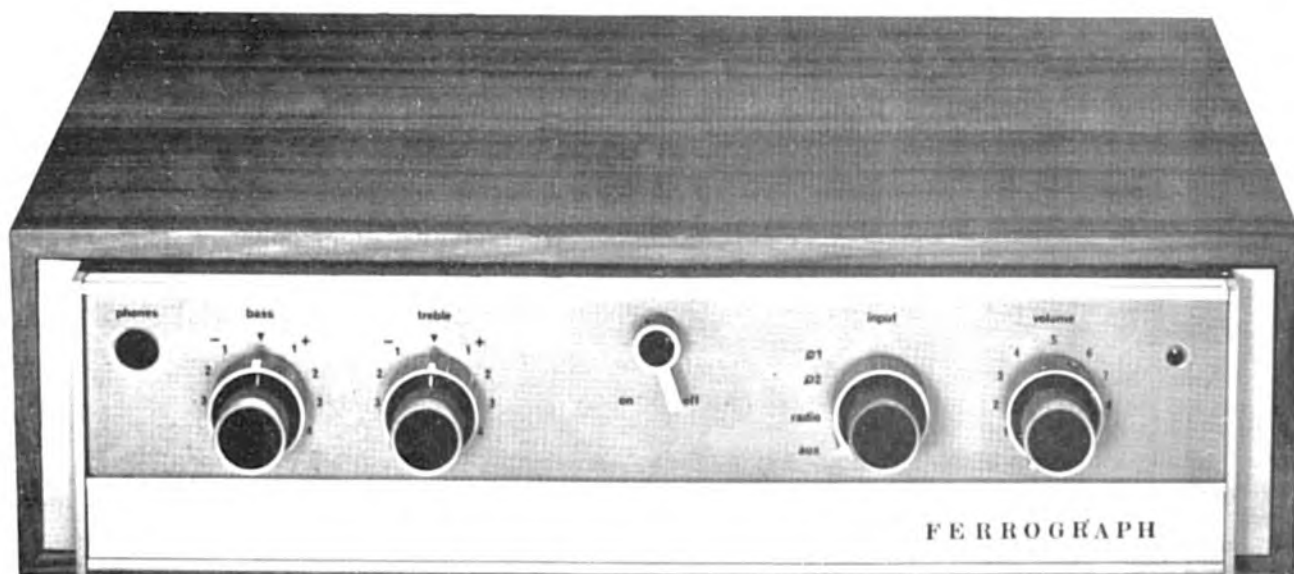
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TRG

IT'S ILLEGAL

—from page 365

artistes, no repertoire. The programme might have been copied, but nothing else has been. All visual attraction has been lost and very few people are prepared to accept such a loss.

The truth is that records are bought when there is a desire to own them. The vast majority of records that are copied by friends go on to a single spool of tape which is promptly erased at the next copying session. If the fears of the gramophone companies were to be realised the tape manufacturers would be jubilant—their sales would leap to astronomic levels. But it doesn't happen. Copying is just not a substitute for owning, and the sooner they come to realise it the better.

As for the morality of such temporary acquisition of programme material, that is slightly more questionable. The copyist certainly has the entertainment benefit of the work of the artistes and the gramophone company without paying for it. Yet so he does if he buys a second-hand disc and as everyone knows there's a perfectly respectable market in such commodities. And what about the library that loans discs to subscribers? As in the case of

books a serious loss of profit and royalties occurs, but it is not illegal. There is a strong move to change the law in this respect so that the borrower is charged a small fee for each book taken out, the money to be passed to the author. This is only fair and Sir Alan Herbert is to be congratulated for taking up this case with such vociferous energy.

Sooner or later the gramophone companies are going to have to admit that their records *will* be copied in spite of their dire threats of prohibition. They are not kill-joys, out to spoil our pleasure; their only interest is in possible financial loss. So the entire matter can be resolved in terms of money. Why not add a few coppers to the price of the record in the first place on the assumption that copying is bound to happen? Over total sales this would represent a large sum for distribution to those whose copyright has been "borrowed." As for actual loss of sales, it could be argued that an increase in the practice of copying records would lead to more, rather than less, record buying.

As we said earlier, there is no substitute for ownership. Tape can be, and will be, erased. A disc (or pre-recorded tape or Musicassette) presents the programme in permanent form. No-one in their right

mind deliberately erases a pre-recorded tape. Of course a tiny minority of persons will "steal" music for permanent use, but so will a minority steal anything of value. But the vast majority will copy, listen, enjoy and then decide whether to buy. If the music is what they wish to own they will acquire it in permanent form. To suggest that the man who copies a dozen pop tunes from his neighbour's gramophone would have bought the records if he had not owned a tape recorder is ridiculous. It is far more likely that he will be urged to buy more records so that he and his friend can indulge in a two-way traffic of copying sessions.

All the gramophone companies have got to come to terms with magnetic recording. They can't fight it, nor can they dictate the uses to which the individual can put his equipment. Rightly or wrongly we resent being told what we can and cannot do. We have no wish to rob anyone. All we ask for is peaceful co-existence without the threat of legal sanctions against what we believe to be moral actions. And paradoxically it is the gramophone companies who stand to benefit most when more and more people find themselves handling their products—even if that handling also means copying.



NATURE NOTES FOR NOVEMBER

BY RICHARD MARGOSCHIS

I THINK that my friend, John Burton, must be one of the most experienced, if not *the* most experienced person in Britain, in judging natural history sound recordings, both from a point of view of quality and general interest value. You see, John is the Librarian in charge of sound recordings at the B.B.C. Natural History Unit which is based at Regional Headquarters in Bristol; he is also a field research assistant dealing with all sorts of natural history enquiries in connection with radio and television programmes, and he is an accomplished field recordist in his own right.

You have only to think how often you hear rural effects on radio and television to realise that this must also be one of the most extensively used libraries of natural sounds, and the fact that they are frequently used on news type productions indicates how readily available the recordings are. A very comprehensive catalogue is available to producers which not only tells them the recordings available but also gives them guidance as to the uses to which they can be put. Not all producers are naturalists and it is only too easy to drop a "clanger" by using a sound which does not "fit"; the song of a bird used to illustrate a period of the year when the bird is not heard in the specific location would undoubtedly bring a shoal of letters from wide-awake naturalists! If a producer requires an "atmosphere" to go with a piece of film shot on the Yorkshire moors, the catalogue gives guidance to the recordings from which he should choose, by considering the location, type of habitat and time of the year. I have already pointed out in these notes the importance

of complete documentation of recordings and I think this fully illustrates the point.

The collection, which forms part of the B.B.C. Sound Archives, was founded in 1948 when Dr. Ludwig Koch, the pioneer of wild-life sound recording, re-joined the B.B.C. staff, and his entire collection was purchased. Dr. Koch continued to enlarge the collection until he retired in 1951. His place was taken by another well-known naturalist, Eric Simms, who, with B.B.C. recording engineer Bob Wade, greatly strengthened the collection of both British and Continental species. It was these two who first used the tape recorder in the field (Koch used discs) and later introduced the parabolic reflector. Eric Simms continued this work until 1958.

The Natural History Unit was established in 1957 with the main purpose of satisfying the B.B.C. requirements in broadcasting on Radio and Television. Its collection is still being enlarged and the growth of interest in this branch of recording is reflected in the greatly increased sources, including freelance workers, from which recordings are purchased. A special agreement is used for this purpose which allows the Corporation to use the material in any of its programmes but the copyright remains with the recordist so that he can use it as he wishes.

If you feel that you have suitable material to offer do *NOT*, in the first place, send the tape; instead, write to John and *tell* him what you have, this can save everybody's time. I believe that at present he is particularly interested in habitat, or "atmosphere" recordings which are now very important to television producers. (Broadcasting House, Whiteladies Road, Bristol 8).

November is a month during which it is well worth while to look out for finches, you'll not hear very much in the way of song from them but a considerable amount of "conversational" twittering does go on. In fact, if you happen to be on the fringe of woodland which contains birch and alder trees, this loud twittering might bring your attention to a flock of birds moving from tree top to tree top; for a while they will settle, peacefully feeding, until a couple of birds give an alarm call at which the whole party moves in bounding flight to another tree. Closer observation will reveal some hanging upside down and performing acrobatic manoeuvres, rather like the tits I mentioned last month, but these are the gregarious siskin and redpoll which tend to become much more widely distributed during our winter months, the siskin moving South from its breeding grounds in the fir forests of Scotland.

Distinguishing features are; red forehead, black chin and pink underparts of the redpoll; black crown and chin and the overall yellowish appearance of the siskin—really not unlike a canary.

NATO, RN, NASA, BBC, use Uher tape-recording equipment...



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HAVE you ever thought about borrowing your music from a lending library? This is not a new idea; for many years both private and public libraries have engaged in the lending of gramophone records. Some have even loaned pre-recorded tapes. The advantages of borrowing are considerable. The subscriber has at his disposal a vast repertoire of programme material which he can constantly change at will. As a rule the commercially organised libraries offer the borrower an option to purchase at an advantageous rate if he so desires.

So the subscribers of such libraries have the advantage of being able to listen quietly at home using their own equipment before deciding whether to buy. If it should be decided not to acquire the record then the only cost involved is the few shillings hire fee. But of course such a library has had many disadvantages. In the first place people loaning out gramophone records must obviously impose fairly strict conditions on the circumstances under which the borrower will reproduce them. A brand new record will be ruined if handled roughly or even if reproduced on equipment of less than transcription quality. If anyone doubts this fact they should try borrowing records from the local public lending library. Unlike the commercial libraries there are probably little or no conditions about the turntables on which the discs are to be reproduced. In most cases the stock of loan records carries little more than a pathetic shadow of the original sound. Naturally a commercial library must be more careful as otherwise the original investment in stock would be wasted.

With the advent of music on tape it was at one time thought that this would provide a much more satisfactory alternative for library use. Unhappily it was soon found that borrowers were doing more damage to the tapes than they did to the records. A dirty great scratch across the surface of a record can be spotted immediately—every pre-recorded tape must be played through in length to spot whether the borrower has accidentally erased a section. The problem appeared to be insurmountable.

But now with the arrival of the Musicassette we have a totally different situation. It is virtually impossible to either erase or break such tape. Maltreatment by the borrower will cause no harm at all—unless he deliberately takes a sledge-hammer to it! There is the added advantage that repeated playing, even on the lowest cost equipment, will not affect the standard of audio quality. I have been thinking for some time that the Musicassette presents an ideal

CROSS TALK

By Audios

medium for an organisation providing library services.

Now my attention has been drawn to just such an enterprise trading under the name of Western (Mail Order) Tapes. For an enrolment fee of £2 the subscriber is entitled to borrow Musicassettes at a published scale of rates which vary according to the loan period from 4s. for seven days to 10s. 6d. for 28 days. Not only can the subscriber purchase the material he has borrowed but this firm also offers a part-exchange service which in effect means that the subscriber can have the advantages and pleasure of ownership for long periods and yet still change his repertoire at will.

Possibly other firms will move into this field—I sincerely hope they will. With the enormous range of cassette equipments now coming on to the market, many of them at highly attractive prices, the Musicassette library should prove itself to be of inestimable benefit.

HOW important is styling? I'm talking, of course, about the styling of tape recording equipment. As tape recorders move out of the cupboard under the stairs into the living room appearance becomes more and more important. It's not enough for a tape recorder to suit the husband in terms of performance—it must also be acceptable to the wife as a piece of furniture.

Unfortunately this requirement for sophisticated styling is something of a mixed blessing. All too often manufacturers find that in order to get the right appearance in their equipment they have to consult professional designers. Now these gentlemen are professionals who know a great deal about their own subject; but that subject is design not tape recording. How many of them have ever used a tape recorder under practical working conditions? Too often the designer evolves a product which certainly looks very pretty but is not necessarily a practical piece of recording equipment.

Such thoughts are bound to come to mind

at the time of the Audio Fair. Here we shall find that manufacturers are proudly displaying their latest creations. Mesmerised by the need to literally "design into the home" some of them might well have fallen into the trap of "designing out" the practical features of the products they are selling. We must never forget that the primary function of a tape recorder is to record and play back. The efficiency with which it performs these tasks should be the first measure of its value. Personally I would a thousand times prefer to have an ugly piece of equipment producing superlative quality rather than an over-designed monstrosity that gave poor quality audio. My wife would almost certainly take the opposite point of view. Why can manufacturers not keep us both happy by looking after styling whilst at the same time preserving the functional aspects of the equipment? I know it's not easy. Yet there is a certain beauty about functional efficiency, whereas in my opinion at least there is no beauty whatsoever in styling divorced from application.

When manufacturers are employing outside design staff the obligation lies with them to ensure that the artistic people understand exactly how the equipment is going to be used and what it is going to be used for. This is why very big firms who employ resident designers score heavily against their smaller competitors who have to go to someone outside the industry when they are thinking of improving appearances. The outside designer can only do his job properly if he is himself an enthusiastic user of the equipment. Judging by some recent releases of new products I would suggest that very few of the people who design them have ever seriously used the equipment they have been restyling. The result can be disastrous. Look around the Fair and see if you can spot any cases of "design gone mad" and then whatever noises of approval might be coming from your wife beat a hasty retreat before finding yourself encumbered by a purchase that will be chiefly remarkable for the disappointment it brings.

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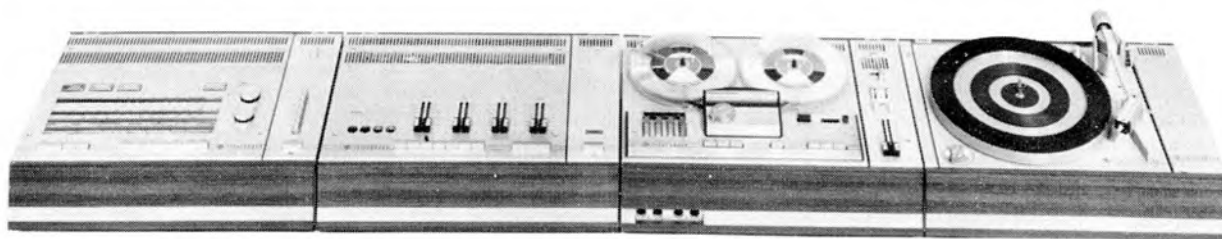
AT the time of writing we are coming to the end of the present season of Promenade Concerts at the Albert Hall. For some reason the last night of the Proms always reminds me of the rather pathetic story of the hi-fi addict. This poor fellow was in the habit of spending every moment of his leisure time with his beloved audio reproducing equipment. Not that he listened to the music—his interest was solely in the functioning of the apparatus.

Like so many who suffer from this terrible malaise he had never been to a concert in his life. Finally a friend persuaded him to visit the Albert Hall and to listen to a Promenade Concert.

During the performance of the first work of the evening our hi-fi addict became more and more agitated until finally he turned to his companion saying, "I'm sorry I can't stand it any more. I must go."

Astounded at this reaction his friend asked him what was the trouble?

"It's this orchestra. I just can't stand listening to them any more. It's the worst sound I've ever heard—there's not enough top. . .!"



The long, low look of the new Telefunken Acusta layout

LONDON SHOW TIME

THE great metropolis of London has recently been the setting for the annual Trade Radio Shows. At this fragmented exhibition, scattered across the breadth of the city and held in a confusing variety of hotel premises, our manufacturers and distributors displayed their products for the benefit of trade buyers. Products on show included all that wide diversity of electronic items which together form our radio industry. Television, both colour and black and white, was bound to take pride of place as the industry's biggest money spinner. But next to television came audio equipment from the truest true-blue high fidelity products to an infectious rash of very low cost (and in some cases very low quality!) so-called unit audio. And all around there sprouted miraculously, like mushrooms in a field, a vast crop of new Compact Cassette equipment.

In reporting on what we saw we are under some considerable difficulty. A great many of the products proudly shown to the trade for the first time at the Radio Show will also be shown to the public for the first time at the combined Audio and Photo-Cine Fairs at Olympia. So a report on the Radio Show is bound to read rather like a pre-view of the Audio Fair. We have therefore attempted to combine the two under this single title of London Show Time.

Our first call was on our old friends **Bang & Olufsen (U.K.) Ltd.** There we saw the new Beocord 1800 (reviewed in this issue) and the new Beocord 2400. This latter is very similar to the 1800 in appearance but is offered complete with audio output stages with a claimed power of 2 by 10 watts RMS. All the facilities of the 1800 are also provided, including the well-known slide potentiometer



Another long, lean look from B & O

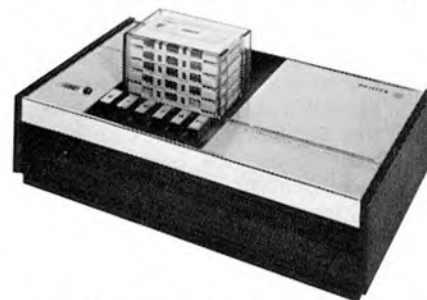
mixing console to control eight monophonic or four stereophonic channel inputs. The price of the 2400 is £208 19s. in teak with an extra £1 1s. for the alternative rosewood finish.

B. & O. were also showing some brilliantly styled high fidelity tuner/amplifiers together with an improved range of loudspeaker equipment. And for those who believe that sales of tape recorders and audio equipment are in the doldrums they advise us that their sales are 135 per cent up on last year's total.

It is always a pleasure for us to call upon the enthusiasts at the **Grundig** exhibition. This firm is now thoroughly entrenched in the upper end of the high fidelity market with equipment that can only be described as brilliant both in terms of performance and appearance. Resolutely refusing to build "down to a price" they have brought ingenious new ideas to the design of their RT100 tuner (price £171 7s. 11d.) and their SB140 amplifier (£187 10s.). We have the feeling that this equipment is destined to be regarded as the Rolls-Royce of the audio world. Readers are strongly recommended to examine them for themselves at the Audio Fair and in particular to discuss with Grundig staff the reason for the provision of two large VU meters and five separate tone controls on the amplifier and the precise operation of the "Tunerscope" tuning system on the tuner. This latter is one of the most

ingenious devices we have come across; even under the difficult reception conditions in the heart of the Hilton Hotel it was working with a precision that was a sheer joy to watch.

Philips Electrical Limited have produced their first mains operated stereo deck and pre-amplifier unit, the N4500. With a recommended retail price of £126 this three-speed quarter-track stereo machine has a three-head system offering A/B monitoring facilities. More big news from Philips is the advent of a cassette auto-changer, model N2502. This mains stereo playback-only machine takes up to six cassettes at a time each of which will be played in turn and then ejected



The long awaited cassette autochanger. Featured by Philips this playback-only machine accepts up to six cassettes at a time, plays one side of each and automatically ejects into a separate compartment

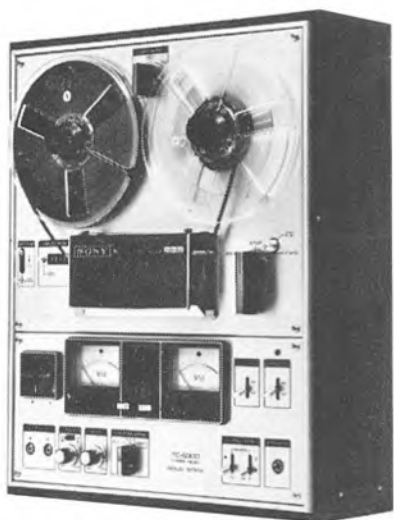
into a separate compartment. Recommended price is £49 10s. Model N2500 cassette player provides full stereophonic reproduction with the use of auxiliary loudspeaker and amplifier equipment and is priced at the modest cost of £24 13s. 2d. Going down still further in cost the N2200 Cassetophone is a lightweight portable monophonic reproducer costing only £13 18s. 1d.

SOME OF THE THINGS WE SAW AND HEARD AT THE TRADE RADIO SHOWS

SOME OF THE THINGS WE HOPE TO SEE AND HEAR AT THE AUDIO & PHOTO-CINE FAIRS



Philips new stereo tape unit, N4500, in a room setting



Professional styling of the Sony TC-630D

At the **Sony (U.K.) Limited** exhibition a great deal of interest was being shown in a completely new single gun portable colour television set, whilst on the audio side attention was focused on the TC 630D, a very professional looking four-track stereo tape deck in which the manufacturer appears to have followed our advice in providing exceptionally large VU meters and easy to use record level controls. This machine sells at £154 15s. Another new model from Sony is the TC252, a four-track three-speed stereo tape recorder with lid integrated speakers selling at £99 15s. An enterprising move on the part of **Sanyo** enables them to make a special offer of their 48M Compact Cassette record/play-back machine plus four Musicassettes at the purchaser's own selection from the new Polydor repertoire for a combined special offer price of £25. This

saves more than £5 on the individual items and will be available only until the end of next January. This is a completely genuine offer that really does save money.

We were delighted to find our old friend Mr. Michael **Van Der Molen** discussing a very specialised Compact Cassette mechanism. Using special heads this will be able to provide triggering pulses to operate external equipment such as slide projectors and will bring a new versatility to this medium. We shall be watching developments of this equipment very closely and will report in detail in due course. (See front cover.)

Having reached this stage of our visits it became quite apparent that it would be utterly impossible to report in detail on every manufacturer's products. There was so much to see and so much to talk about that one is left with an impression of unbounded optimism and enthusiasm on the part of the vast majority of the exhibitors with just a few on the fringe of the industry who care as little for us as they do for the customers whose money they are after in exchange for inferior goods whose performance is so far below standard as to be pathetic. Unfortunately assessments of audio quality depend entirely upon the experience of the purchaser's own ear. A very small number of unscrupulous people are prepared to take advantage of the situation by talking largely about "high fidelity" when in fact what they are offering is a strident, harsh sound that will quickly tire the listener and produce headaches instead of enjoyment. On the other hand perhaps this is not done deliberately—the designers and manufacturers might well not understand the difference themselves!

But we have every sympathy with the firm who produces truly low-cost equipment and readily admits that it is an unashamedly low-cost low-quality appliance which nevertheless will undoubtedly be vastly superior to the obsolescent items in the home it is intended to replace. Just because we enthusiasts tend to take the extreme view with regard to quality there is not the slightest reason why the man-in-the-street who expects to be able to purchase a complete audio outfit for around £60 should not be able to do so. But no one must try to kid this man that he is buying high fidelity sound reproduction. At that price level he is not and probably never will. But if it makes a cheerful noise to him then jolly good luck to him. Typical of this equipment is the **Dansette Compact**, a record playing unit equipped with a four-speed mini auto changer, integrated amplifier with bass and treble controls and a pair of completely separate detachable speakers on eight feet of cable selling at an inclusive price of £38 9s. 4d. This equipment does not pretend to be what it is not and as such offers outstandingly good value for money.

The name of **Uher** has long been associated with top flight recording equipment at the upper end of the price range. Now they announce a new budget model, the 714, a 3½ ips monophonic four-track machine priced at £49 17s. 8d. Beautifully styled it represents a significant departure from the established tradition of this well-known German manufacturer. Also released for the first time are the Uher Variocord 23 and Variocord 63. Big feature of these top quality machines is the interchangeable head assembly which converts from quarter-

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SONY

For spot-on sound . . . from on-the-spot recording – Model TC 800A, a compact battery/mains portable mono tape recorder for the discriminating enthusiast. Three speeds ($1\frac{7}{8}$, $3\frac{3}{4}$, $7\frac{1}{2}$ i.p.s), two tracks, 5" reel capacity, and a servo-controlled motor for precise timing accuracy. An automatic recording level control (with manual over-ride) ensures perfect recordings every time. And to complete the picture, there's that superb finish which Sony make the rule.

Recommended retail price £84.15.0

Recording system 2-track monaural.

Power requirements AC 110, 120, 220 or 240V, 50/60 Hz; DC 12V.

Power consumption AC 8 watts (max).

Reels 5 in. or smaller.

Tape speed $7\frac{1}{2}$ ips (19 cm/s), $3\frac{3}{4}$ ips (9.5 cm/s), $1\frac{7}{8}$ ips (4.8 cm/s).

Frequency response 30 Hz – 18 kHz at $7\frac{1}{2}$ ips; 30 Hz – 13 kHz at $3\frac{3}{4}$ ips; 30 Hz – 7 kHz at $1\frac{7}{8}$ ips.

Power output 1 watt.

Inputs Microphone: sensitivity 0.195 mV, impedance 600 ohms.

Line: sensitivity 0.055V, impedance approx. 100k ohms.

Remote control.

Speed tuning.

Output Monitor: standard output level 0.775V (load impedance 10k ohms)

Motor D-503F DC servo-motor.

Speaker $3\frac{1}{2}$ in x $6\frac{1}{2}$ in.

Battery life Up to $6\frac{1}{2}$ hours in continuous recording (with supplied batteries).

Dimensions $12\frac{1}{4}$ in. (w) x $4\frac{3}{16}$ in. (h) x $10\frac{1}{4}$ in. (d).

Weight 11 lb. 13 oz. with batteries.

Accessories Microphone (F-85 MTL), pre-recorded tape (5 in. tape), Sony reel (R-5A), connecting cord (RK-36), head cleaning ribbon, super batteries, magnetic earphone (ME-20).

Optional accessories Telephone pick-up (TP-4S), car battery cord (DCC-2AW), remote control (RM-6), microphone mixer (MX-600M), foot switch (FS-5), carrying case (CK-8B).



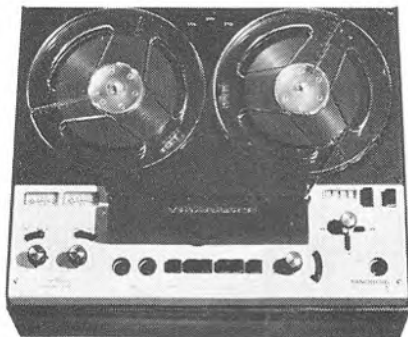
SONY
RESEARCH MAKES THE DIFFERENCE

Sony (UK) Ltd Ascot Road, Bedfont, Feltham, Middlesex

LONDON SHOW TIME

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track to half-track and *vice versa* in a few seconds. Prices start at 101 gns. and alternative head units complete with built-in equalisation adjustment cost from £12 13s. 2d.



New styling for the Tandberg 6000X

Farnell-Tandberg Limited were displaying the latest models at the Norwegian Trade Centre. Most noteworthy is the new stereo tape deck Model 6000X which now replaces the existing series 6. The new machine involves a dramatic change in styling as it moves away from the traditional Tandberg concept of good looks. With many new refinements and its sleek contemporary appearance the 6000X will undoubtedly attract a great deal of attention. Other items include Tandberg 1600X, stereo tape deck of the traditional Tandberg breed at a competitive price of £89, the Tandberg FM tuner/amplifier and the magnificent Huldra 9 tuner/amplifier. This latter is a real beauty and has many features that will interest all enthusiasts. Ask about it and other Tandberg equipment at the Audio Fair and at the same time take a close look at the Tandberg turntable Model 150. Based on the Thorens TD150AB Mk. II it is a piece of excellent transcription equipment at a reasonable price level.

The Murphy Division of Rank Bush Murphy Limited have always been noted for their daring and original approach to cabinet design. Remember their painted television sets? Defying all predictions these brilliantly coloured television cabinets have proved themselves to be best sellers. Now the same philosophy has been devoted to this company's Audio Plan equipment which can be obtained in brilliant white, vibrant orange and a range of other modern colour schemes. After looking at a monotonous procession of teak cabinets we found this to be a refreshingly new approach to a problem that has had practically no thought devoted to it at

all. Congratulations to Rank Bush Murphy for forcibly pointing out that there is still plenty of room for the new idea in audio equipment.

We were delighted to be able to report in one of our recent New Products features the advent of the Cambridge firm of Pye into the tape recorder market. The Trade Show provided an ideal opportunity for us to meet the executives concerned and we found them to be real enthusiasts in every way. They are enthusiastic about the new equipment they have to offer and also about the whole subject of tape recording. Not only were Pye representatives given a crash course in tape recording techniques (based upon features in *TAPE Recording Magazine* of course!) but they were also asked to take part in their own tape recording contest for which prizes were awarded. We listened to some of the entries and they showed both imagination and an excellent grasp of the subject. This is precisely the right way to handle the marketing of recording equipment and we wish Pye every success with their new products in the future. On the cassette side, by the way, they have something quite new which we shall be pleased to discuss in detail in a future issue.

Telefunken have now completed their range of system audio which develops the popular long low look. Tape deck, tuner, amplifier and record player are all matching units and as such could form a central decor motif in any modern living room. On the tape recording side a number of new models appear for the first time to complement their already wide existing range. Amongst them is Model M202 a half-track automatic record machine and M212 the four-track version.

The new Audio Products Division of Pullin Photographic Rank Aldis drew an enormous amount of trade interest with the new Akai 4000D tape unit (reviewed by us last month) and its new recommended retail price of £87 10s. It was generally agreed that this machine sets a new value-for-money standard which is also reflected in the new Rotel range of amplifiers and tuner amplifiers marketed by the same organisation. Prices for this Japanese manufactured equipment range from £45 10s. for the lowest cost stereo amplifier to £129 for the prestige stereo tuner amplifier. Performance in the trade demonstration room was impressive and we look forward to investigating this equipment more closely in the near future.

All the exhibits referred to above have been examined by us and we now mention them editorially as we believe that the products will be of particular reader-

ship interest. But we also saw many more manufacturers' displays and to these good friends of ours we would apologise if we have omitted specific reference to them. Most, but not all, of the items specifically referred to here will also be on show at the forthcoming Audio and Photo-Cine Fairs where a number of manufacturers who did not take part in the Trade Radio Shows will also be exhibiting. Of particular note amongst these are Agfa-Gevaert Limited who will be producing what they describe as "a ten minute long explosion of sound" together with a demonstration of their new hi-fi low noise tape. B.A.S.F. will be making a special point of showing their low noise high output tape together with Compact Cassettes in the new KK8 box which is said to offer advantages in providing the best means yet for tapesponding and for including Compact Cassettes and three-inch reels in a tape library.

The long awaited new generation of recording equipment from Brenell will be welcomed by all enthusiasts. First model is designated ST200 for the half-track version and ST400 for the four-track machine and it comprises a two-head stereo record/playback system complete with audio output stage of remarkably high quality. Both the deck and the electronics as well as the general styling are completely new and the recommended price ticket for these models will be in the order of £145 inclusive of purchase tax.



Brenell's model for the 'seventies

Do-it-yourself enthusiasts will be pleased to find a range of completely new models under the Heathkit label from Daystrom Limited and these include a tuner/amplifier kit giving a claimed 5 watts RMS per channel at £36 10s. less cabinet. Also available is the new Ambassador speaker system which will be marketed alongside the existing extremely popular Cotswold kits.

From Highgate Acoustics we shall see displays of equipment from Arena, Luxor, Perpetuum-Ebner, Pickering, Alfa-

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For the man who will only settle for perfection...

Ferguson make this 3 speed, 4 track stereo tape recorder.

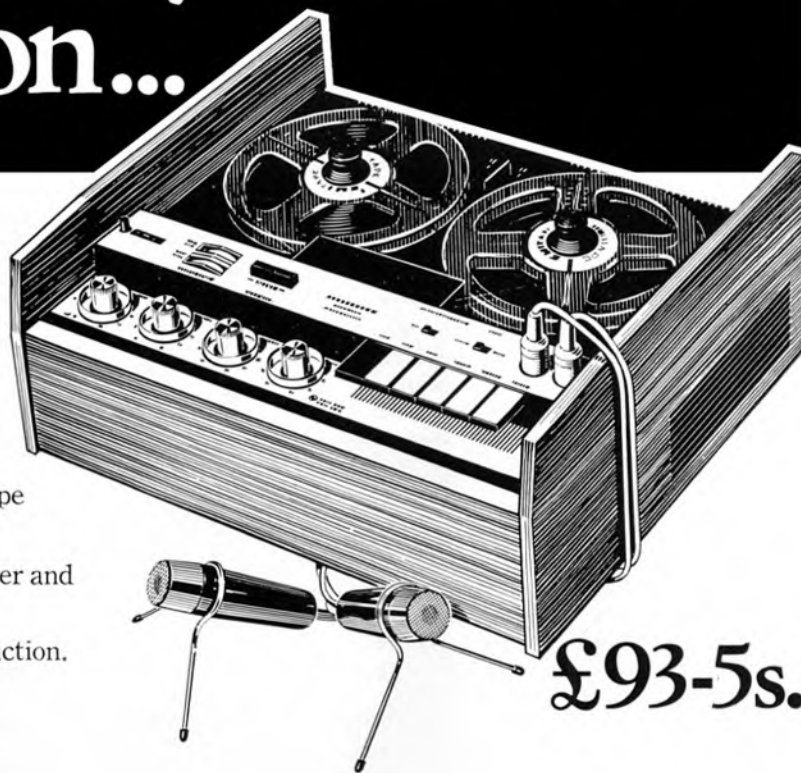
This is the one. The stereo tape recorder that every real enthusiast wants to get his hands on. Ferguson know what you want from a stereo tape recorder and they've packed all your needs into the 3244.

Just imagine your ideal tape recorder and see how it checks out with the 3244.

- Stereo/Mono recording and reproduction.
- 3 speeds - $7\frac{1}{2}$, $3\frac{3}{4}$, and $1\frac{7}{8}$ i.p.s.
- $\frac{1}{4}$ track stacked stereo heads
- Transistor amplifier channels
- Clutched dual concentric controls
- Input mixing
- Calibrated record level meters
- Latching pause control
- Auto stop at tape ends
- Remote pause facility
- Monitoring while recording on built in speakers
- Track transfers on mono
- Second channel monitoring
- Interlocked controls
- Comprehensive input/output sockets
- Two dynamic microphones, 1,200 ft of tape, take-up spool, connecting lead and remote pause switch on 20ft lead.

Not only does the 3244 sound great but it looks great too in its teak veneered cabinet and neutral tinted transparent lid which is designed to match Ferguson Unit Audio equipment.

So if you take stereo tape recorders as seriously as Ferguson do, go along to your nearest dealer and ask for a demonstration. When you've heard the 3244 you'll know that it sounds like a tape recorder should.



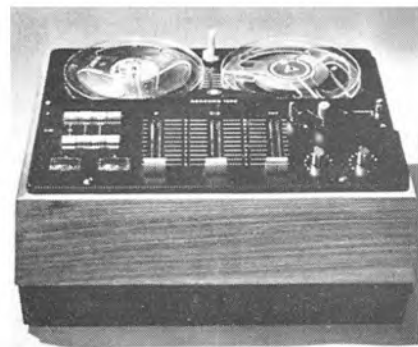
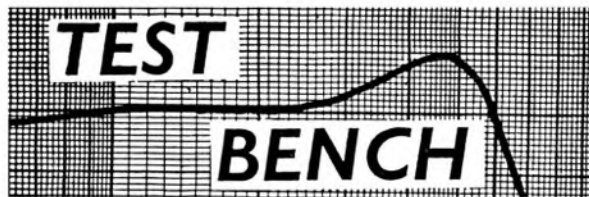
FERGUSON tape recorders

To: British Radio Corporation Limited,
284, Southbury Road, Enfield, Middlesex.
Please send me a full colour leaflet for the
Ferguson 3244 stereo tape recorder.

NAME _____

ADDRESS _____

F19



BEOCORD 1800

Manufacturer's Specification

Dimensions: 17 $\frac{3}{4}$ x 14 $\frac{1}{8}$ x 8 $\frac{7}{8}$ inches.

Weight: 35.64 lbs.

Voltage: 110, 130, 220, 240 Volts AC 50 Hz (may be converted to 60 Hz). Max. consumption 50 Watts.

Inputs: Microphone 50/200 Ohms balanced 35 microvolts. Radio Low Impedance 47 kOhms 2.5 mV. Radio High Impedance 100 kOhms 50 mV. Gramophone as Radio. Line 250 mVolts.

Outputs: Headphones 0.8 V at 47 Ohms load, 1.8 V at 470 Ohms load (with volume control). Radio 1.25 V 25 kOhms. Line 1.25 V 7.5 kOhms.

Tape Speeds: 7 $\frac{1}{2}$, 3 $\frac{3}{4}$ and 1 $\frac{7}{8}$ ips.

Tracks: 2/2 tracks record, 2/2 and 2/4 tracks playback.

Maximum Reel Size: 7 inches.

Wow & Flutter: 7 $\frac{1}{2}$ ips 0.07 per cent RMS, 3 $\frac{3}{4}$ ips 0.11 per cent RMS, 1 $\frac{7}{8}$ 0.18 per cent RMS.

Frequency Response: 7 $\frac{1}{2}$ ips 20-20,000 Hz (\pm 2 dB 30-18,000 Hz); 3 $\frac{3}{4}$ ips 20-15,000 Hz (\pm 2 dB 30-13,000 Hz); 1 $\frac{7}{8}$ ips 30-7,500 Hz (\pm 2 dB 40-6,000 Hz).

Equalisation: DIN 45513 1966/7, NAB 1965.

Distortion: Better than 3 per cent at 0 VU.

Signal to Noise: Better than 60 dB to DIN 45405.

Crosstalk: Better than 60 dB at 1,000 Hz mono. Better than 55 dB at 1,000 Hz stereo.

Distributors: Bang & Olufsen U.K. Ltd., Eastbrook Road, Gloucester.

Recommended Price: £184 16s. including purchase tax. ($\frac{1}{2}$ -track in teak.)

INVESTIGATED BY R. HIRST AND D. KILLICK

BEOCORD 1800 TEST CHART

Frequency Hz	Overall Response dB			Playback Only dB	Signal/Noise Ratio dB	Distortion	Crosstalk dB
	7 $\frac{1}{2}$ i.p.s.	3 $\frac{3}{4}$ i.p.s.	1 $\frac{7}{8}$ i.p.s.				
30	+0.4	-0.3	+0.8				
40	-0.2	-0.5	-3.0	+0.9			
50	-0.1	-0.9	-2.4	+0.8			
60	-0.2	-0.7	-2.5	+0.4			
100	-0.3	+0.2	-2.0	+0.1			
250	+0.1	+0.4	-0.7	0			
500	-0.1	+0.3	-0.8	+0.2			
1000	0	0	0	0	57	3% at 0 VU + 3dB	60
2000	0	+0.4	+3.4	+0.5			
4000	+0.5	+1.9	+3.3	+0.6			
6000	+1.5	+2.8	+1.4	+0.7			
8000	+2.2	+3.6	-6.2	+0.7			
10000	+3.2	+4.6		+0.4			
12000	+3.7	+6.3		+0.3			
14000	+4.6	+1.9		+0.2			
16000	+5.0	-1.0		+0.2			
18000	+5.4			+0.2			
20000	+6.4			+0.1			
22000	+4.6						
24000	+1.2						
Wow and Flutter	0.07%	0.10%	0.17%				

NOTES.—The Overall Response figures relate to record and playback. Playback Only relates to the reproduction of a 70 microsecond test tape at 7 $\frac{1}{2}$ i.p.s.

For Signal-to-Noise Ratio the tape was recorded at 3dB above 0 VU and then the input signal was removed from the record amplifier. By reference to the signal level recorded and the resultant tape noise, the noise voltage was read off, with the tape still in motion. Distortion is quoted against a 1,000 Hz signal recorded at the same level and the figure is an R.M.S. value (see text). Wow and Flutter is also R.M.S., the test frequency being 3,000 Hz. Test equipment used includes: Bruel and Kjaer Signal Generator, B & K Frequency Analyser Type 2107, B & K Level Recorder Type 2305, Marconi Distortion Factor Analyser and Gaumont-Kaylee Wow and Flutter Meter.

RECENT reviews have tended to concentrate on the popular deck and pre-amp machines, or "tape units" as they are called. Such equipment requires the use of an external amplifier and speakers; by omitting these facilities from the tape recorder the manufacturer can keep the price down whilst at the same time providing a complete record/playback mechanism for those many purchasers who already own audio equipment. It's a very sensible approach be-

cause the internal speakers in any tape recorder can do no more than offer a monitoring service and there's really no effective substitute for an efficient external amplifier. So machines of this breed are likely to offer really good value for money for most people.

This month we are looking at the new Beocord 1800, a machine which differs fundamentally from other equipments reviewed in its "professional" type mixing desk design and wide range of control

features provided. We hesitate to use the word "complexity" when referring to any tape recorder because it can so easily convey the false impression that operation is a skilled job. In fact any ten-year-old should be able to operate any machine and obtain reasonable results. We could almost use such a state of affairs as a bona fide user test. If we did the Beocord would not come out of it very favourably, because it is a complex

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TEST BENCH—BEOCORD 1800

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machine and unfortunately the instruction manual is set out in a singularly unhelpful way. Time has to be spent learning how to use this machine, so it is all the more important to assess what practical performance one might expect after having gone to the trouble to “swot it up.”

We will start with our usual laboratory investigation results, but first a brief description of the machine itself. It is a mains-powered, half-track, three-head, stereo deck and pre-amp operating at three speeds, $1\frac{1}{8}$, $3\frac{3}{8}$ and $7\frac{1}{2}$ ips, fitted with a separate four-track playback head for the reproduction only of four-track recordings (four heads in all) and provided with a sophisticated mixing panel. An alternative model is four-track record and playback only, and since this carries the same general model number, Beocord 1800, intending purchasers are warned to specify their precise requirements very carefully when ordering to avoid confusion. To clarify the situation with regard to this review, we used the half-track model and all measurements were taken in the half-track mode.

Reference to our tabulated Test Chart reveals a very interesting state of affairs. Replay of a standard calibration tape gives a startlingly flat curve, deviating within little more than half a dB of the datum line. All the way from 40 to 20,000 Hertz the equipment is playing back within a tolerance of plus 1 dB and minus nothing. Quite an achievement! Yet overall response at $7\frac{1}{2}$ ips shows a steady rise in the curve from plus 0.5 dB at 4,000 Hertz to as much as plus 6.4 dB at 20,000 Hertz. Why are we now apparently outside specification when the playback figures were so very, very good?

To answer this question we have to come back once again to the record head/tape relationship which critically affects such precise readings. Firstly, it will be seen that the ascending curve follows a fairly steady progression to give an “inclined straight line” climbing above level. Such a display at once indicates to us the need to change tape to a sample of slightly lower coercivity. Had we been able to do this there is little doubt that the figures would have been pulled down to agree with the manufacturer’s claimed specification. However, we used the tape supplied with the machine (which is just what any new owner would do) and thought it fair to publish our figures on that basis. The brand of tape, by the way, was BASF LGS 35.

Overall response at $3\frac{3}{8}$ and $1\frac{1}{8}$ ips naturally follows the same pattern, giving a commendable spread across the audio

spectrum but with a decided lift in the upper register. Reproduction of tapes recorded in this way calls for a little top cut at the amplifier, which, of course, will cut down hiss and any other unwanted high frequency noise. However, we must say that we feel it to be a pity that the machine had not been accurately set up for use with the tape supplied, although the figures obtained prove its capabilities without doubt.

To measure signal-to-noise we fed in a sine tone to a level which gave 3 per cent distortion, and found this to be 3 dB above 0 VU. This therefore confirms the claimed “better than 3 per cent at 0 VU.” The actual noise at plus 3 dB was shown to be 57 dB below signal, and since this is an unweighted measurement it agrees with (or is even slightly better than) the claimed 60 dB weighted to DIN standards. Crosstalk channel-to-channel at this plus 3 dB level was found to be better than 60 dB, which is excellent.

Speed stability in the Beocord 1800 is particularly good. RMS wow and flutter at $7\frac{1}{2}$ ips was found to be 0.07 per cent, at $3\frac{3}{8}$ ips 0.10 per cent and at $1\frac{1}{8}$ ips only 0.17 per cent. Not so very long ago this latter figure of 0.17 per cent would have been regarded as acceptable for $7\frac{1}{2}$ ips operation—now we have it at $1\frac{1}{8}$ ips on this machine. If the frequency response at that speed could have been pushed up to around 10,000 Hertz it would have offered outstandingly good slow-speed recording; however, the response curve tails off sharply above 6,000 Hertz thus limiting the usefulness of the slowest speed. Not that anyone could carp about the increased quality our chart shows can be expected by increasing speed one notch to $3\frac{3}{8}$ ips!

We could summarise our technical findings by saying that the performance of the equipment lines up with the price ticket on the machine and promises just about the best possible quality playback of pre-recorded material with the need for careful selection of tape (or judicious top cut at the amplifier) for reproducing its own recordings. So we next turn to examine the equipment from an essentially practical point of view.

On arrival the machine was packed in a carefully designed cocoon-like polystyrene inner box enclosed in cardboard. We imagine it could suffer all manner of transportation indignities quite safely without coming to any harm. Enclosed in a well-made teak open-topped cabinet, the base is in the form of a black plinth with a couple of very sensible slots for easy carrying. A transparent plastic cover is provided, and the size of the deck is such that it can be used with this cover in place. The main control panel is inclined forward to give easy access to

the mixing console sliders, function buttons and run lever. A pair of edge-type meters, lighted when mains are on and with red warning lights in the record mode, are also on this panel together with a very efficient pause control, three-digit revolution counter and a pair of rotary knobs to independently set levels at the tip-ring-and-sleeve monitor jack at the side. The tape path is a straight line through the sound channel, but care must be taken to pass it behind the two large guides on pivoted tension arms at either side.

All external connection sockets (other than headphone monitor at the side) are situated *beneath* the machine. This is doubtless an advantage in a permanent installation where wiring changes are rarely made—we found it to be a continual source of irritation as the machine has to be up-ended to change connections. The sockets, by the way, are phono with parallel DIN facilities.

One of the most interesting features of the Beocord 1800 is the mixing console. Three pairs of slider controls are provided, and they perform the following functions: right-hand pair for adjusting line-in level, for sound-on-sound or for echo effects—centre pair for gramophone or radio inputs with switchable sensitivity (see specification)—left-hand pair for 50 to 200 Ohms balanced microphone inputs. Operation of these slider potentiometers is very precise indeed and levels can be accurately set against numeric scales to the finest limits. The whole of the surface area of this mixing console is protected by a sheet of thin transparent plastic. Rather a nice thought, that; it ensures that finger marks can be easily wiped off with a damp cloth so preserving the “as-new” appearance.

Full “before” and “after” record monitoring facilities are available through the press keys on the left of the panel, where similar keys control sound-on-sound, record mode and straight through amplifier facilities. Control of the record function is quite separate for each track so multi-tracking techniques can be easily carried out on this machine. The automatic stop system is duplicated with a switched selector; one setting stops on the usual metal foil contact only, the other gives an additional photo-sensitive stop which is actuated when there is no obstruction in the path of a tiny pilot light. This latter can be most useful as it will work if a section of opaque oxide is removed from the tape to allow the light to shine through the transparent plastic base, a technique that can be used for stopping the programme when half-way through a spool of tape.

Now we come to our real complaint

Please turn to page 379

TEST BENCH

—from page 378

about the Beocord 1800. Are we unreasonable to object to the layout and marking of the deck when we find we even have to refer to the (very inadequate!) instruction book to find out how to switch the mains on and how to select the desired speed? It really is as bad as that. Of course it's all very simple when one has learnt all the tricks—but that is not quite the point. Tape recording is basically a simple, uncomplicated process. Why make it unnecessarily obscure by concentrating more on styling than on conveying sensible information? Which is just what happens here. Even the speed change control is delicately shaped with the slightly tapered end indicating the setting. But how should the stranger know that? And how is he to know that the symbols I, II, and III refer to the three speeds, or that selection of one of these will switch the mains supply on? Or that further rotation to one of the "Os" between will switch mains off? Confusion is all the more complete when the owner discovers that one of the keys on the deck will also switch the mains supply on—with very good reason which he will discover if he has the patience to properly read and digest the instruction manual.

No, this is not an easy machine to use for the first time. But there are practical reasons for all its apparent peculiarities, and when one is used to the function and operation of the many controls it provides one of the most flexible and versatile recording equipments one could find on the domestic market. Almost a "studio in miniature."

The more one uses the 1800 the more one comes to appreciate the fact that it fairly bristles with useful and essentially practical features. Take the inclusion of a four-track playback head in the half-track version, for instance. Why should the owner of what must be admitted to be an expensive half-track machine be deprived of the ability to reproduce four-track recordings? After all, virtually all commercial pre-recorded stereo tapes are now four-track. Well the Beocord 1800 looks after this problem very simply. It is just not a problem any longer. A press key behind the rear head cover cuts out the half-track playback head and puts the four-track head into circuit. So the owner has all the benefits of the improved quality of half-track recording without losing the ability to play back the narrower track tapes.

In use we found the motor noise to be a little higher than we would have liked, although it is quieter than some of its competitors in this price bracket. The needle in the left-hand channel meter in one of the two models we examined stuck and would not fall below about minus 8 dB every now and then. This was probably a very minor mechanical fault, but it did give us a few nasty moments looking frantically for the non-existent hum!

Playback of pre-recorded tapes, both half- and four-track, confirmed the benefits of the excellence of the playback curve; quality was excellent with low noise and an enviable clarity of instrumental sound. When using a pair of really good speakers the separation of the individual instruments in an orchestral

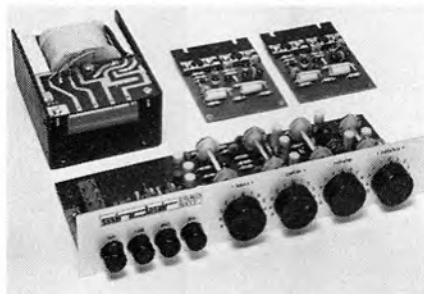
recording provides a brilliance of audio quality that is truly startling in its recreation of the original sound. Dubbing "off the air," both mono and stereo, was wholly successful, as was the copying of 15 ips masters. In the latter exercise the increase in hiss and high frequency content on an "A/B" comparison was noted and corrected as recommended in this review at the main amplifier.

The Beocord 1800 is not an easy machine to summarise. It offers a host of valuable and down-to-earth features, and yet simple editing is complicated by the obstruction of the head faces by the angle of the mixing console! Well, we have never yet come across the perfect machine so we must expect a minor snag somewhere. The instruction manual needs to be completely rewritten and the markings on the deck should be clarified. But once the owner has mastered what we must call the complexities of the instrument he will have at his disposal a top-grade recording station that can be used for just about every conceivable application from semi-professional work (low impedance balanced line mike inputs—just what the doctor ordered!) to public address (the mixing console will adequately handle all manner of programme distribution requirements) to recording at home from the hi-fi (plus four-track playback and the facility to indulge in the most advanced techniques for producing way-out music of one's own). Not only will the machine do all those things, it will also do them rather well, which means that its cost is more than justified for the man who wants a great deal more than straight-forward record/playback facilities.

LONDON SHOW TIME

—from Page 375

Arena and Schweizer. Some of these brands are new to the UK, the latter including a superbly designed range of record accessories and storage systems. **Sinclair Radionics Limited** will also be seen at the Audio Fair with a new range of high fidelity modules and a new loud-speaker, the Q16. The latter is based on



Sinclair Stereo Sixty, a high-powered amplifier of advanced design

the popular Q14 and the retail price is £8 19s. 6d. Their Z30 amplifier is said to provide up to 25 watts continuous sine wave output power, to be uniquely flexible and to have a lower distortion than any other amplifier on the market. And for those who imagine that such a piece of equipment must obviously be beyond their pockets let us hasten to add that the recommended price of the Z30 is just 89s. 6d.

Trio and Teac equipment will be shown by **B. H. Morris & Co. (Radio) Limited**. Under the former name is the well-known range of amplifiers, tuners and tuner amplifiers and under the latter a fascinating breed of recording equipment from the Teac Corporation of Tokyo. Important features of both Trio and Teac products are the advanced styling and comprehensive range of facilities provided.

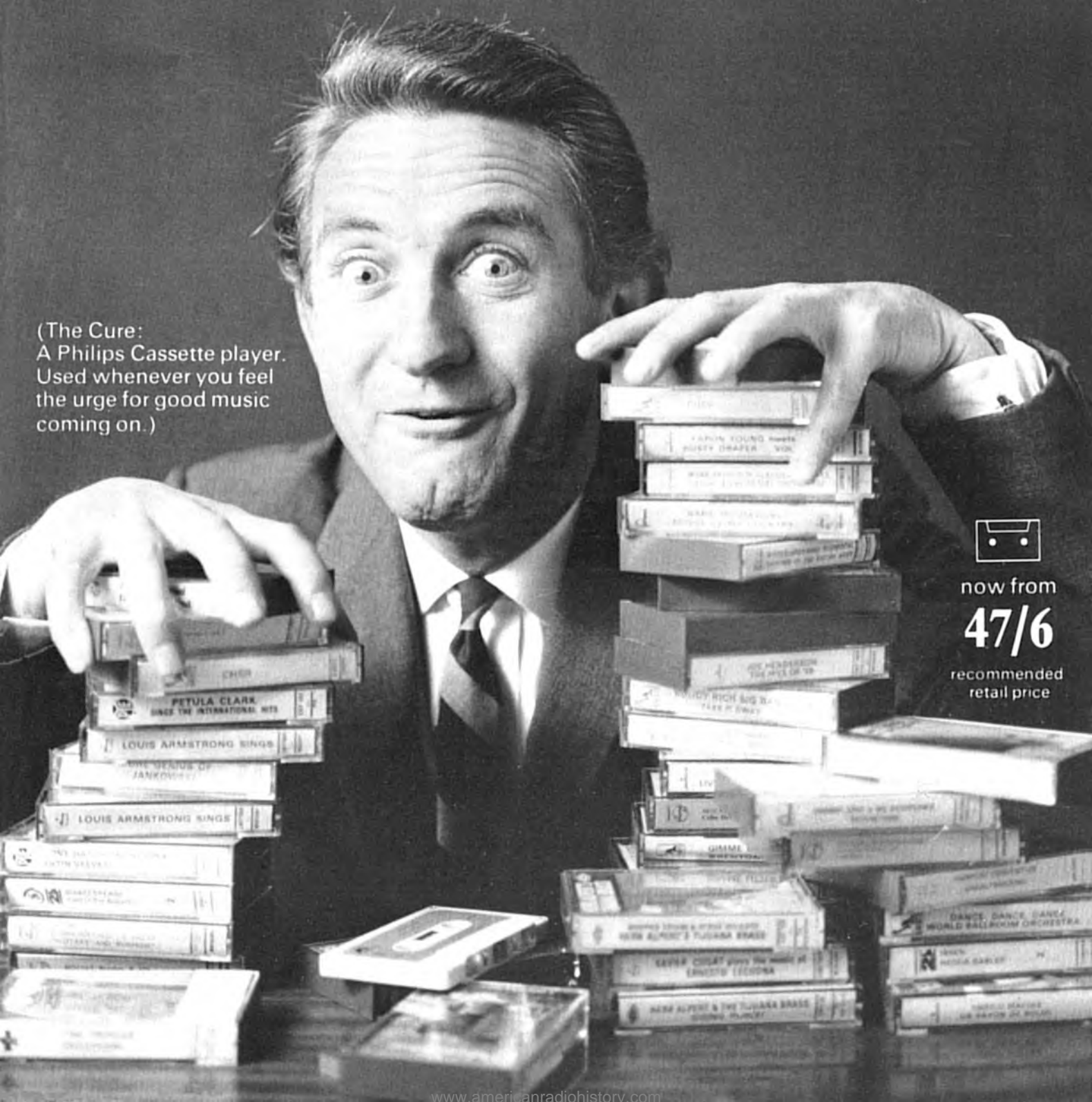
At the time of writing there are doubt-

less many more firms who will be sending us news of their Audio Fair activities. Unfortunately we have again had space for only a small selection of the good things that will be available for the public to hear, to see and to handle. Developments in audio are now taking place so rapidly and are so much to the advantage of the consumer that we can only sincerely recommend that readers should go to Olympia to examine the new products for themselves. These notes are intended to be no more than an apéritif to the main dish. We must conclude by warning that there will be so much to see and hear that visitors should be quite sure to allow themselves plenty of time in the exhibition. Do not be misled into thinking you can "do" the Audio Fair in an hour or two. Make a day of it, enjoy yourself, and do what we always do—come away with just a little bit more knowledge and experience than you arrived with.

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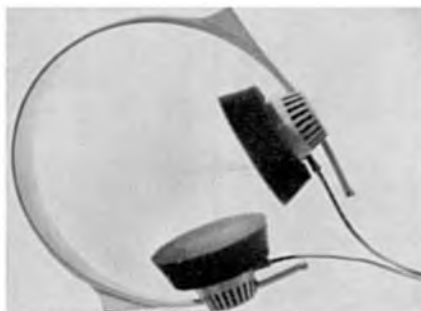
With a claimed frequency range of from 20 to 20,000 Hz linear by comparison with a free sound field the distributor claims acoustic discovery for these Sennheiser stereo headphones. They say that a new cardioid technique and controlled two-way radiation give perfect bass and treble plus comfortable listening. Continuing to quote from their own description they add that the sponge earpads (removable for cleaning or replacement) hold the capsules away from the ears to give a perfect acoustic without the need for the ears to be imprisoned in hot sticky plastic.

Knowing the reputation of the firm of Sennheiser and having a high opinion of their microphones already distributed by Audio Engineering Ltd. I was naturally intrigued to see if these claims could be substantiated in fact, or whether they would prove to be flights of an over-enthusiastic sales-manager's fancy. So I was delighted to receive a sample headset for evaluation.

The first thing one notices about these headphones is their extreme lightness, and one could be excused for thinking of the word "fragility." In practice it was found that they were not fragile at all, thanks presumably to the fantastic strength of modern plastics. Next one is nonplused by the earpads themselves. These comprise circular discs of foam rubber about three-quarters-of-an-inch thick, but unlike any other headset I have come across they totally enclose the two drive units. One expects to find an internal cavity at the centre of the pad to expose a transducer; in the HD414 the moving coil sound sources are *totally* enclosed at the business end.

Instead of having cups ringing the ear as in conventional design we have here a pair of solid sponge discs held flat against each ear by means of a plastic based spring headband. Each individual phone can be adjusted for height by sliding up or down the specially shaped extremity of the headband. The connecting lead is detachable by means of miniature plugs and sockets in each phone, colour coded for left-hand and right-hand channel reference.

Before attempting to use any headset one must first check impedance and then consider whether the plugs provided (if any) will suit one's equipment. Impedance of the HD414 is 2 K ohms each capsule, unlike many headsets now available at 8 to 16 ohms impedance. Enclosed in the



box is a large double sheet of instructions containing no fewer than twenty schematic diagrams showing precisely how the plugs and adaptors supplied can be suited to match the connections and impedances of no fewer than six hundred different makes and models of tape recorders. The British distributors have further increased this range by including yet another adaptor terminating in a tip ring and sleeve jackplug to suit the increasing number of machines and amplifiers that offer this most convenient form of stereo connection. This really is the most comprehensive instruction leaflet I have ever seen for a headset, and by means of simple colour codings the adaptors included in the purchase price given maximum possible versatility although I must question the distributor's claim that they will suit *any* tape recorder. It would be safer to say that if the purchaser found he had to bother with additional plugs then he would be extremely unlucky and his equipment would be somewhat unusual.

Full marks for versatility and imagination in the matter of connections. But what about quality? I'm afraid I come to this question with pre-conceived ideas. In the first place I just do not like wearing headsets. Most manufacturers claim that their products are comfortable and will not make the ears hot and sweaty. As yet I have not come across any make of headphones which I personally find to be totally comfortable and which do not make my ears sweat. But perhaps I am awkward in this respect. Certainly the HD414s *feel* different. They feel different because they *are* different in presenting an unbroken disc of foam to the ear instead of the more usual cup. Since relative degrees of comfort are purely personal I can only say that I found the HD414s to be as good as the best I have tried in this respect.

After getting used to the feel of these phones I carried out listening tests, bearing in mind the essential requirement to bring up listening level gradually so as to avoid damage to the ears. A headset should never be connected to any apparatus with the volume control in an advan-

ced position. It requires a very low level of output to give a high listening level within the ear-pieces, and if this level should be accidentally exceeded the listener will not receive only a very nasty (aural) shock but in extreme cases could suffer physical damage to the eardrum. It's really very easy indeed to use headphones with complete safety, but the user should always exercise great care where a volume control to the headset outlet is provided—especially when the phones are being worn by children.

Such sombre thoughts were immediately dispelled as soon as I heard what the HD414s are really capable of. The great snag with headsets is that unless an acoustic seal is provided around the ear they will not adequately reproduce low frequencies; and some models, even expensive ones with oil-filled cups, are still remarkably deficient in the lower register. I can only say I was both amazed and thrilled by the results from the HD414s. Never before have I heard such a full rich bass from a pair of cans as these were able to give me. I found this to be quite remarkable, particularly in view of the fact that the earpads do not provide an acoustic seal at all in the normally accepted sense of the word. Wishing to confirm my own judgment I arranged for a number of other people to use these phones and for their listening test provided an organ recording with plenty of full-bodied low frequency sound going right down the register. I wasn't mistaken. Everyone who used the phones confirmed that the bass was present, audible and clean. The response was equally good in the middle and upper ranges, although I must mention that in common with other headsets one can get a "ringing" or "peaking" effect when the listening level is set a little too high.

Before concluding I must also mention that all headphones do suffer from one inherent drawback. Although described as "stereo" and in spite of the fact that such phones do permit the left-hand channel to be fed directly to the left ear and the right-hand channel to the right ear the subjective listening effect is not really stereo at all as we accept the definition of the word. Sometimes the word "binaural" is used to describe the stereo headphones effect. Even that is misleading, since to me it indicates merely listening with two ears. Sufficient to say that there is a difference in spatial representation when listening via a pair of conventional speakers as compared to the same sound reproduced on headphones. At the same time there is also a very vast difference in price.

D. G. K.


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MUSICASSETTE

REVIEWS

BEETHOVEN. "Egmont" Overture Opus 84, Symphony No. 5 in C Minor Opus 67, "Consecration of the House" Overture Opus 124. The London Symphony Orchestra conducted by Antal Dorati. Philips CPC 0049. 49s. 11d. including purchase tax.

Often referred to as "The Glorious Fifth" the main item of this collection is one of the best known of all orchestral works. Its opening notes, forming the "Victory Vee" sign, became a call for resistance during the last war, bringing to the occupied countries the promise of freedom. Now we have such plethora of "Fifths" that one almost shudders at the thought of yet another.

However, this is a situation that must constantly arise if Philips are to produce a classical list worthy of the name, so here's more strength to their elbow. Let's have 1 to 9 as well, please! Especially if quality is as good as it is in this album. Recording is first-class. On playback we have a fine full range of instrumental tones, clear separation of internal voices and a dynamic range that anyone could be proud of.

I will not waste time discussing the Fifth itself. Various versions have already been reviewed in these pages. If you are after the work in cassette form then this, to my knowledge, is the only one existing. Perhaps not up to Karajan whom I prefer, but all the same a most enjoyable performance.

The two overtures that are coupled with the symphony are also well-known standards of the concert platform. Listening yet again I marvel at the sound that can be produced by this 1 $\frac{1}{2}$ ips system. It really is unbelievable. But I must stress the need for reasonable quality speaker equipment for the reproduction of this album. By turning down the volume to a very low level on the amplifier and then comparing the result with maximum bass cut I can get some idea of what the owner of tiny loudspeakers might expect to hear. It is a very thin sound. But that is not the fault of the record, only of the playback equipment. Take it from me, a more than adequate frequency range is present on this recording; when reproduced through a pair of good enclosures the quality is dramatically good, and don't forget the volume control should not be set at a too modest level.

STRAUSS. Famous Waltzes. Wiener Symphoniker conducted by Wolfgang Sawallisch. Philips CPC 0051 49s. 11d. including purchase tax.

It's hard to believe that the waltz could have once been considered immoral. But that's what people thought a hundred or more years ago. Perhaps some of the things we think of as "immoral" today will seem to be as absurd to our descendants in another hundred years time.

Leaving aside the ethics, the dances of the time had grace and dignity. Ally to those qualities great music, the greatest perhaps of its kind, and you have one word—Strauss. The member of that notable family represented here is, of course, Johann Strauss junior, who lived from 1825 to 1899. And the works performed so well by this accomplished Viennese orchestra are: *Emperor Waltz* Opus 437, *Artist's Life* Opus 316,

Voices of Spring Opus 410, *The Blue Danube Waltz* Opus 314, *Roses from the South* Opus 388 and *Wine, Women and Song* Opus 333.

Copious sleeve notes give adequate information about each item. Even including the comment by Brahms, who, on hearing *The Blue Danube* for the first time, is said to have exclaimed: "Not by me, alas!" Both this waltz and *Voices of Spring* were regarded as dismal failures when first performed. The latter was described as "weak melodically", a judgment you and I might think incredible. Is there a lesson for us here when we dismiss some of our contemporary music too lightly? Will future generations think our opinions ignorant and too hasty? Perhaps so, but why worry about such abstruse problems when one can settle down with Strauss. Recommended, naturally.

THE INCREDIBLE PACO PENA. Flamenco Guitar. Fontana CFP4032. 47s. 6d. including purchase tax.

I will not dispute the title for one single moment. For my money Paco Peña is indeed incredible. With superb recording to back him up the guitar of Peña performs the most intricate gyrations until the listener's credulity is truly strained. What a remarkable performer this man is! And from the detailed information he has himself written for the sleeve notes he must be a dedicated man as well. Let me say right away that this is one of the very finest Flamenco recordings I have heard. Tops in all respects.

The incredible Peña gives us: *Cantinas, Alegrias, Tarantas, Tientos, Bulerias, Soleares, Granadinas, Fandangos and Zapateado*. This repertoire has been carefully chosen to portray some of the most important Flamenco rhythms. Apart from *Alegrias*, which was composed by Ricardo, they are all traditional tunes suitably arranged by Peña. And he goes to a great deal of trouble to explain to us both the meanings of the titles and the origins of the individual dances.

As he points out, the art of the Flamenco guitar came into being as no more than an accompaniment to Flamenco singing. It has only come into its own as a solo instrument during the last thirty or forty years. Since when its popularity has been ever increasing. Depressingly difficult to perform, Peña admits that the *compás*, or rhythm, requires the greatest skill. I'll believe that without question, too. It is quite different to anything else found in Western music.

This collection is so good it can only be strongly recommended.

BOOKENDS. Simon and Garfunkel. CBS40-63101. 47s. 6d. including purchase tax.

Firm favourites with British audiences, Simon and Garfunkel have a quaint individuality all of their own. On this album they indulge in a certain amount of "audio horse-play" apart from the pure theatricality of *Voices of the old people*. Strange that. They do seem to have a pre-occupation with age for some reason. Could probably be explained by those who specialise in such things as an expression of their own latent guilt complex. They are so obviously CLEAN YOUNG AMERICANS that sooner or later it must begin to weigh heavily on them.

Numbers performed include: *Bookends theme, Save the life of my child, America, Overs, Voices of the old people, Old friends, Bookends theme, Fakin' it, Punky's dilemma, Mrs. Robinson, A hazy shade of winter and At the zoo.*

There's no doubt these two have something to say. Their comments on the problems of contemporary young people are international, even though they have a strong American flavour. But the message is universal in its expression of articulate bewilderment, and as such is reminiscent of many other groups today.

Recording is difficult to comment on; there are so many weird things going on all over the place. Deliberately gimmicky stereo gives a surprising depth and meaning to the voice-picture *Voices of the old people*. On the whole I think I like it, but the mixture is a little strong and takes some getting used to. Since it is unlike anything else in both its material and production you, like me, will have to try it to find out.

FROM LARRY WITH LOVE. The Larry Page Orchestra. Page One CPO10003. 47s. 6d. including purchase tax.

This is unashamedly described as "music for dreaming, for relaxing, for cosy evenings, for gentle people everywhere. . . ." In view of the rather sticky sentimentality of the last phrase we know just what to expect. We are disappointed. The particular fruit from which the juice is relentlessly squeezed is made up of: *The last waltz, Girl on a swing, Somewhere my love, A man and a woman, Tonight in Tokyo, Music for night people, Love in the open air, Tale of two themes, Up up and away, From Larry with love, The lonely one and Ode to Billy Joe.*

Unfortunately the Larry Page Orchestra dissipates a little too much energy, makes a little too much noise, gives way to too much temptation to make this one of the top slob albums. I've heard much, much stickier collections, compared to which this is almost Palm Court. No, if I were to be a "gentle person" hell bent on an evening's relaxation I shouldn't choose this particular album. Or if I did I should expect my equally gentle companion to exclaim: "For Gawd's sake turn that ruddy row down, can't you?"

So it boils down to a bit of a dead loss. Unless, of course, you should be interested in Larry Page renditions of these numbers. A bit artificially coloured to my ear, but they might suit you. Never, though, on those quiet romantic evenings that the sleeve notes suggest. Unless, again, your idea of romance is very different to mine. . . .

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MUSIC ON TAPE

7½ ips STEREO

Equipment used for review tapes: Amplifiers—Quad valved and Ferrograph F307 Loudspeakers—Celestion and Jordan-Watts. Tape Recorders—Akai 3000D and Tandberg 64X

THE DILLARDS Back Porch Blue Grass. Elektra EKTP 7232. 7½ ips four-track Stereo 57s. 5d. including purchase tax.

Straight from the Deep South comes the sound of The Dillards to bring with them a genuine hill-billy flavour that is often missing from modern folk singers. With a touch of the spirituals and a lively "twangy" sound the group has a refreshingly natural approach to their singing and performing. I can only say it sounds "right." Classed as "mountain music" it has a nostalgia all of its own; and the blend of sound achieved by the four boys is quite distinctive in the best possible way.

The sing-song includes: *Somebody touched me, Polly Vaughn, Banjo in the hollow, Dooley, Lonesome Indian, Ground Hog, Old home place, Hickory hollow, Old man at the mill, Doug's tune, Rainin' here this mornin', Cold Trailin', Reuben's train and Duelin' banjo.*

Recording is first class. In particular the stereo image is firmly fixed with a good sense of depth and perspective. Instrumental balance with the voices is well maintained and the whole is cohesive, presenting a true impression of actual live performance. The "Back Porch" of the title represents The Dillards' attitude to their music. They don't so much give a recital as fool around on the back porch to amuse themselves—and presumably their neighbours. It is this feeling of happy enthusiasm which gives the collection such an enviable distinction. And it's infectious, too. So if you want to catch the spirit of the blue grass and the mountains you could not do better than acquire this album.

OSCAR PETERSON TRIO PLUS ONE (CLARK TERRY). Mercury STC 60975. 7½ ips four-track Stereo. 88s. including purchase tax.

So we have to agree that the 7½ ips stereo tapes are expensive. But from the very first note the listener is left in no doubt at all as to the value he has bought for his money. Jazz can be—and often is—a noisy medium. With good quality recording and reproduction there's no noise at all; just music, music, music.

The tones of the instruments leap from the speakers to live, really live, right in front of you. It's truly an experience to hear jazz at this high standard of technical quality. The sleeve notes refer to the musicians' phrase which speaks of being "stretched out." Never was the medium further stretched than on this particular tape.

Choice of repertoire is broadly based, including: *Brotherhood of Man, Jim, Blues for Smedley, Roundalay, Mumbles, Mack the Knife, They didn't believe me, Squeaky's Blues, I want a little girl and Incoherent blues.*

For sheer, solid presence this album will take some beating. As I listen I am only too well aware of the fact that the Trio plus Clark Terry are here in the room with me. The technicians have done a splendid job, giving superb definition and instrumental balance. All of which is matched by the virtuosity of the performers. Such precision with uninhibited spontaneity is the very essence of jazz; here it is displayed to perfection. Never a hint of "we are making a record" or "I am playing to the microphone." Just free melodic lines with inspired improvisation, all worked delicately into the fabric of the melody.

Unlike some of the highly-paid performers who accept success as it shines too easily on them, these boys are professionals at the top. They got there the hard way—by learning their jobs from the very beginning and then taking the trouble to be better than anyone else. But that alone is not enough. To this one must add that touch of divine fire which makes the difference between the musician and the artist. It is an out-of-this-world feeling that makes this album worth every penny of its purchase price. An excellent collection that really cannot be faulted on any count. Lovers of jazz can't go wrong with it.

3¾ ips STEREO

DVORAK. Symphony No. 5 in E Minor, Opus 95 (From The New World). SMETANA. The Moldau (No. 2 of Má Vlast). The Berlin Philharmonic Orchestra conducted by Herbert von Karajan. Columbia TD-SAX 2275 3¾ ips four-track Stereo. 47s. 4d. including purchase tax.

Dvorak, the musically gifted son of a village tradesman in Bohemia, reacted in the only way he knew how to the tremendous effect of a visit to the American Continent. As he absorbed the chaotic confusion of the great cities and contemplated the vast open spaces that must have been very dear to his country-bred heart he began to express his feelings in music. So, in 1893, was his Fifth Symphony written—"From the New World."

Master of the spontaneous melodic line, Dvorak's symphony quickly achieved public acclaim. Full to the very brim with both drama and contrast it is a veritable *tour de force* for any concert performance. The remarkable thing—or one of the many remarkable things—about this work is its clear statement of the divisions of America, divisions between poor and rich, country and city, black and white, and yet its equally clear interpretation of the oneness of the nation. Not only was Dvorak a master of composition but he was also a master of human observation as well. In a single work he has been able to summarise the conditions and the aspirations of one of the greatest peoples on earth. A great feat even for a national of the country concerned, but for Dvorak, son of an Eastern European villager, it can be regarded as nothing less than stupendous.

This is the kind of work at which Karajan excels. Past-master at the art of musical showmanship, he here has a work he can really make the most of—and he does. One is always conscious of the dominance of his personality well in control; what else is the conductor for? Recording this work must have presented some tricky problems but the

engineers have risen nobly to the occasion to give us some really good sound with some commendable internal balancing. The broad sweeps of instrumental colour come right through in bold strokes of sounding brass and wood wind, yet the pianissimo strings sing with no less clearly defined voices. This is an album that must be heard to be appreciated.

Still in the East we have Smetana's *The Moldau* following the fourth movement of the Symphony. It provides a release from the complexity and absorbing interest of what has gone before, and as such is an ideal coupling.

By the way, I was listening to this tape as the radio was broadcasting news of the first landing on the moon. A new world? Perhaps. Who knows. But I suspect it will be a long time before a composer of Dvorak's calibre can interpret it musically for us.

This is an album that can be strongly recommended without reservation.

THE BEST OF THE WORLD'S GREAT MELODIES. Vilem Tausky with The Studio 2 Symphony Orchestra. Columbia TD-TWO 258 3¾ ips four-track Stereo. 41s. including purchase tax.

The title of this album is really too pretentious for words. Just who has the impudent arrogance to assert that the ten melodies he happens to name are "the world's best?" Presumably Vilem Tausky. "The most popular" might have been more reasonable, but even that more modest assertion could probably be proven to be untrue.

Anyway, lets have a look at his selection. In his infinite wisdom Vilem Tausky gives us: *Prelude to Act I* from "Carmen" (Bizet). *Habanera* from "Carmen" (Bizet), *Entr'acte to Act IV* from "Carmen" (Bizet), and *Gypsy Song* from "Carmen" (Bizet). Well, well. So a single composer in a single opera has given us nearly one half of the world's greatest melodies! This alone clearly shows the patent absurdity of the collective title. To continue we have: *Dance of the Comedians* from "The Bartered Bride" (Smetana)—the only non-Bizet item on side 1—*Prelude to Act I* from "La Traviata" (Verdi), *Your Tiny Hand is Frozen* from "La Boheme" (Puccini), *Intermezzo* from "Cavalleria Rusticana" (Mascagni), *Barcarolle* from "Tales of Hoffman" (Offenbach) and *Spanish Dance No. 1* from "La Vida Breve" (De Falla).

My own suggestion for a more truthful heading to the record might be: "A Few of the World's Most Commercial Melodies." And I don't see any harm in that, either. They're commercial because they are rattling good tunes that stood and will stand the crucial test of time.

The recorded quality of these new E.M.I. 3¾ ips tapes has rightly had the approval it deserves. But, as a critic, it is part of my job to ensure that the original high standard does not deteriorate. Unfortunately my copy of this album has a great deal of very nasty flutter drop-out effects at the beginning of side 2. This is really not good enough. If anyone should find such a fault in one of these tapes I urge them to return the record to the manufacturer with a strong letter of complaint. E.M.I. can deliver the goods—and it's up to us to make sure they do. But please be quite sure your grouse is justified before writing, and I hope no-one will try to pull a fast one by claiming the replacement of a tape that has been damaged at home. The difference between manufacturing faults and things like accidental partial erasure by the purchaser are only too obvious . . .

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NEW PRODUCTS

ROTEL FROM RANK

AUDIO Products is the name of a new department that has been set up within the Rank Audio Visual Division to handle the marketing and distribution of products within the audio field. Initially the department will handle the already established Akai range of tape recorders and tape decks, although this will be extended periodically to other items of interest to audio enthusiasts.

The first of the new items is Rotel, a Japanese produced range of tuners, amplifiers and receivers comprising in the first instance eight models priced from £45 10s. to £129. It is stated that following the policy already laid down for Akai equipment every Rotel unit is guaranteed for both parts and labour for a full twelve months from the date of purchase.



Lowest cost item of the range is the Model 100-AMP stereo amplifier. It has a claimed RMS output power of 15 watts per channel at 8 ohms and a full complement of controls including separate treble and bass, loudness switch, mode switch, high filter and facilities for tape recording and monitoring. Harmonic distortion is quoted as 0.4 per cent at 10 watts referred to 1 kHz.

Dimensions are 4-in. high by 12½-in. wide by 8½-in. deep. The weight is 9 lb. and the recommended retail price is £45 10s.



Next in line comes the Model 120ST AM/FM stereo tuner. Using field effect transistors in the front end the specially designed multiplex circuit with automatic FM mono/stereo switching is said to assure excellent FM stereo separation. A signal strength tuning meter is provided to permit accurate station tuning and antenna orientation. Selection of FM stereo broadcast stations is simplified with the help of the stereo indicator.

Sensitivity on FM is quoted as 2.5 microvolts for 20 dB quieting and the multiplex separation is claimed to be better than 35 dB referred to 1 kHz 100 per cent modulation. FM harmonic distortion is given as less than 1 per cent at 1 kHz. Dimensions are 12-in. wide by 3½-in. high by 10-in. deep. Weight is 6.6 lb. and the recommended retail price inclusive of purchase tax is £49 10s.



Model RA-840 is a solid state stereo amplifier with a claimed output of 42 watts RMS per channel at 8 ohms. It is said that this device has every feature and controlling function that the finest instrument should have. The directly coupled circuitry uses neither driver nor output transformers and the fused output stages and massive heat sinks protect transistors for added long life.

The full control complement includes dual bass and treble controls, tone defeat switch, mode switch and complete facilities for tape recording and monitoring as well as speaker selection switch for main and/or remote operation.

Dimensions are 5½-in. high by 14½-in. wide by 10-in. deep. Weight is 16 lb. and the recommended retail price of the RA-840 stereo amplifier is £75.

First of the stereo tuner/amplifiers, Model 130, has a claimed output power of 16 watts RMS at 8 ohms with stated harmonic distortion of 0.3 per cent at rated output 1 kHz 8 ohms.

On the radio side the 130 incorporates specially designed multiplex circuitry with automatic FM mono/stereo switching and a signal strength tuning meter. On the front panel a stereo headphone monitoring jack is provided and the controls include both bass and treble, a five position selector switch, a mode switch and AFC switch.

Measuring 16-in. by 9½-in. by 4½-in. the weight is 11 lb. and the recommended retail price of the 130 is £79 including purchase tax.

Jumping now to the top of the range we have the Rotel FAX-660 AM/FM integrated stereo tuner/amplifier. RMS output is claimed to be 60 watts total (8 ohms) and harmonic distortion 0.2 per cent. Sensitivity on the FM side is 2.2 microvolts and stereo separation 35 dB.

The full range of controls include dual bass and treble, high filter, mode switch, loudness switch, muting switch, tape monitor switch, speaker selector switch and headphone jack. Dimensions are 17½-in. by 6¼-in. by 13½-in. Weight is 17.5 lb. and the recommended retail price of the FAX-660 is £129 including purchase tax.

Audio Products, Pullin Photographic, Rank Aldis, P.O. Box 70, Great West Road, Brentford, Middlesex.

AM/FM RADIO PLUS COMPACT CASSETTE

THE full range of new Pye tape recorders reported in the New Products section of our July issue is now augmented by Model 9000 mains/battery cassette machine which incorporates an AM/FM radio.

This mono equipment using Compact Cassettes (two track) has a built-in 2½-inch diameter loudspeaker and an output of 600 mW. The machine includes full record/

playback facilities and is of course suitable for the reproduction of pre-recorded Musicasettes. Features include meter-type record level/battery condition indicator, recording sockets for microphone, radio, record player or second tape recorder and playback via built-in or separate loudspeaker or via playback socket through separate amplifier and speaker.



The machine is supplied complete with blank cassette, moving coil microphone with remote control stop/start and microphone stand, mains converter unit, earphone, carrying case with shoulder strap, hand strap and microphone pouch at a recommended inclusive retail price of £44.

Pye Group (Radio and Television) Limited, P.O. Box 49, Cambridge

THREE NEW SONY MODELS

THREE new tape recorders are announced by Sony (U.K.) Limited as additions to their existing range.

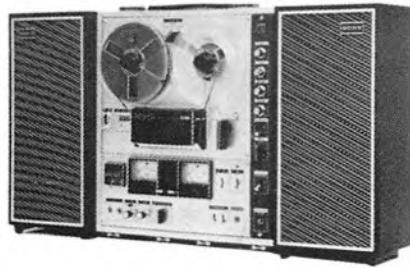
Model TC-210 is an economically priced battery/mains mono machine whose features include: "Sony-o-Matic" automatic record level control, 5-in. reel capacity, two speeds, $3\frac{3}{4}$ and $1\frac{1}{4}$ ips, loudspeaker monitoring and retractable carrying handle.



The machine is said to operate with the lid closed and comes complete with cardioid dynamic microphone with stop/start facility, a 5-in. demonstration tape, a 5-in. empty reel and a battery and mains lead at a recommended retail price of £48.

Model TC-360 is a four-track stereo/mono record/playback equipment operating at three speeds, $1\frac{1}{8}$, $3\frac{3}{4}$ and $7\frac{1}{2}$ ips, and is fitted with three heads to provide A/B monitoring facilities.

Slide type record level controls are provided as well as large calibrated VU meters. A complete range of facilities is available and the frequency response is claimed to



be 30-22,000 Hertz at $7\frac{1}{2}$ ips with a wow and flutter of 0.09 per cent at that speed. Signal-to-noise is given as 50 dB and harmonic distortion as 1.2 per cent at rated output.

Weight of the TC-630 is 46 lb 3 oz and the supplied accessories include microphone, pre-recorded tape, empty reel, connecting cord, head cleaning ribbon and reel cap. At a recommended inclusive retail price of £199 15s, the TC-630 offers complete stereo system facilities including its own lid integrated speaker systems.



Model TC-666D is a completely new four-track, three motor auto reverse stereo tape deck featuring what is described as Sony ESP (Electronic Sensory Perceptor) which automatically reverses tape direction from right to left without the need for cue strips.

The TC-666D operates at two speeds, $7\frac{1}{2}$ and $3\frac{3}{4}$ ips, and has a claimed frequency response of 20-22,000 Hertz at the former and 20-15,000 Hertz at the latter. Signal-to-noise ratio is given at 53 dB without Sony-matic noise reduction and 59 dB with Sony-matic noise reduction. Wow and flutter is claimed to be 0.09 per cent at $7\frac{1}{2}$ ips and harmonic distortion less than 1.5 per cent.

Accessories include empty reel, connection cord, head cleaning ribbon, reel cap and dust protector and the recommended retail price of the TC-666D is £264 10s.

Sony (U.K.) Limited, Ascot Road, Clockhouse Lane, Bedfont, Middlesex.

Sanyo Marubeni (UK) Limited recently took up occupation of their new thirty-thousand square foot modern offices and distribution centre at Bushey Hill Lane, Watford, Hertfordshire. Mr. John Wren was recently appointed sales manager and distribution of Sanyo products (other than in Scotland) is now aimed directly at retailers instead of being concentrated through wholesalers.

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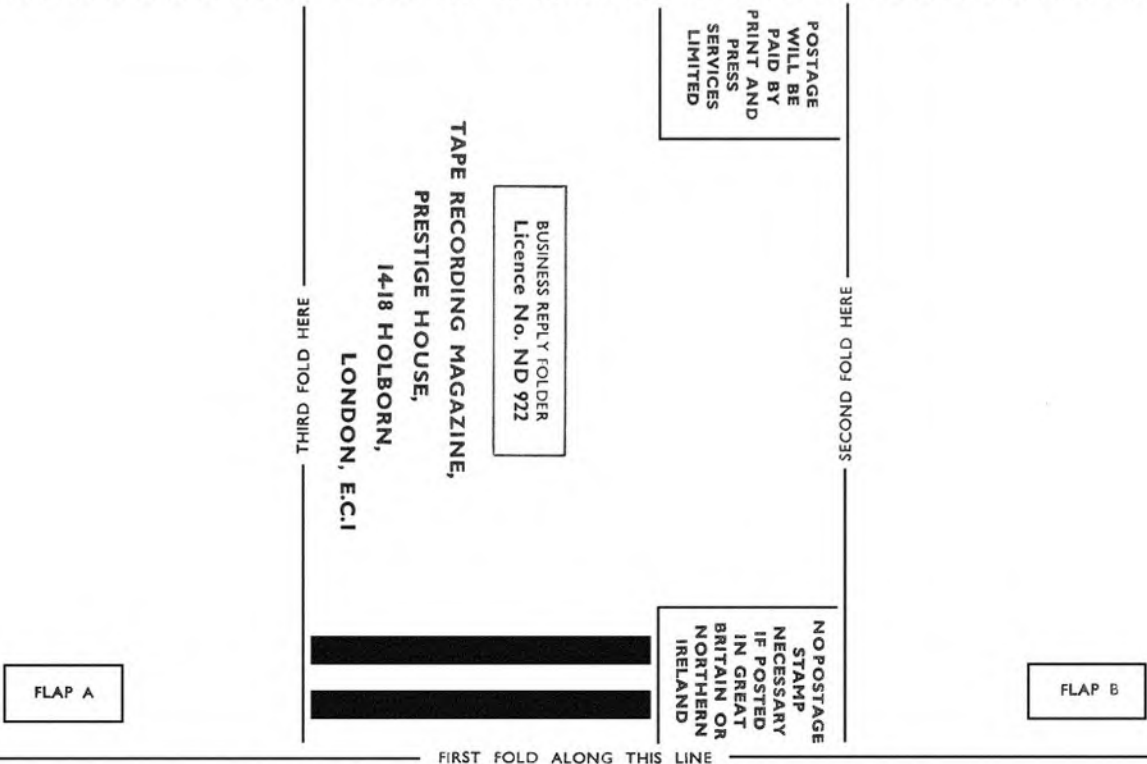
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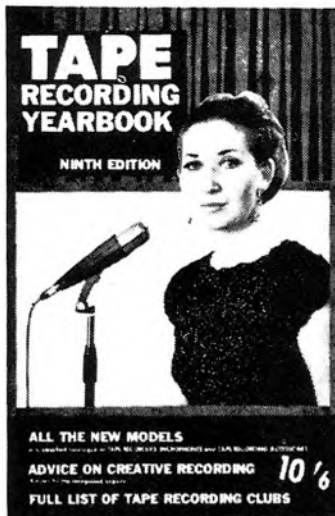
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Ferguson 3224 Mono
Ferguson 3216 Mono
*Ferrograph 713
*Ferrograph 702/4
*Ferrograph 722/4
Fidelity Studio 4 Track Mono
Fidelity 'Braemar' 2 or 4 Tr. Mono
Grundig TK120 DL 2 Track Mono
Grundig TK144 DL 4 Tr. Mono
Grundig TK149 DL 4 Tr. Automatic
*Grundig TK245 DL Stereo Mono
*Grundig TR247 DL 4 Tr. Stereo
*Grundig TK340 DL 4 Tr. Stereo/3 sp.
Philips 4307 4 Tr. Single speed Mono
Philips 4308 4 Tr. 2 sp. M.
*Philips Professional PRO.12
Philips Stereo 4404 2 sp. 4 Tr.
Philips Stereo Cassette 3312 with 2 sp.
Philips 4407 St. 3 sp. 4 Tr.
*Philips 4408 Prof. 3 sp. 3 Tr. Stereo
*Revox 77 Stereo 2 or 4 Tr.
*Sanyo 801 St. Pre-amp.
Sanyo 929 4 Tr. 2 sp. Stereo
Sanyo 939 4 Tr. 2 sp. Stereo

*Sanyo 990 3 sp. 4 Tr. Stereo
Sharp RD.706 2 sp./2 Tr./Batt. Mains
*Sony 801 Pa/Deck 3 sp. 4 Tr. St.
Sony TC230W
*Sony 335 Deck and Stereo Pre-amp.
*Sony 255 Deck and Stereo Pre-amp.
Stella 9123 4 Tr. 2 sp.
Tandberg 15 2 or 4 Tr. 3 sp./M.
*Tandberg Series 6X Pr. A/Dk Stereo 3 sp. 2/4 Tr.
*Tandberg Series 12X 3 sp. 2/4 Tr. St.
Telefunken 204 T.S. 4 Tr./St.
Telefunken 501 4 Tr./M.
Telefunken 203 Stereo/Mono 4 Tr. 2 sp.
Telefunken 201 Mono 4 Tr.
*Uher Royal De Luxe 4 Tr. 4 sp. St.
*Vortexion WVB/7 3 sp. 2 Tr. Mono
*Vortexion CLB/7 Stereo 2 Tr. 3 sp.
Wyndors Vanguard 3 sp. 4 Tr. Mono

BATTERY PORTABLES AND CASSETTE TYPES

*Philips 2205 Batt./Mains Cassette
Philips EL3302 Cassette
Akai 10 V 4 Tr. St./BM
Tandberg Cassette Series II 2
Ferguson Cassette 3236
Grundig Cassette C200
Sanyo Cassette
Aiwa Cassette/Batt. Mains
Sharp 504 2 Tr. 2 sp./Batt. Mains
Sharp 505 2 Tr. 2 sp./Batt. Mains
Stella 473 Cassette
National 4 Tr./2 sp./Batt. Mains
National Cassette Batt./Mains
Telefunken 302 4 Tr. 2 sp. Mono
*Uher 4000L. 4 Tr. 2 sp. Mono
*Uher 4200.4400 2/4 Tr. 4 sp. Stereo

*Microphone extra

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Eagle Mixer
Hammond 5-way Mixer
Philips Pre-amp.
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Tapes in all grades and lengths by: B.A.S.F., Scotch, Philips, E.M.I.
Cassettes by Philips, etc.
Headphones by AKG, Ampex, Akai, Sansui, Nikko, Philips.

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Telefunken 300 with cell
Uher 4000 with cell

NOTE. When writing, please quote TRM 8 and include s.a.e. for reply.

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Model MR-990

Solid state mains stereo/mono tape recorder

Solid state, 14-transistor circuitry delivering 10 watts maximum music power per channel. 4-track monaural/stereo operation. 3 speeds controlled by single change lever. Greatest tape economy: 8 hours on one 7" reel at 4-track monaural operation. Varied applications: recording from tuner, turntable, or microphones. Playback through loudspeakers supplied or separate amplifier. Other facilities include sound-on-sound, sound-with-sound, pause control and automatic shut-off device. Line output socket and 5 pin DIN (rec./pb) socket. Headphone and speaker jacks on front panel.

SPECIFICATIONS

Recording system :

AC bias $\frac{1}{4}$ track

Erasing system :

AC erasing $\frac{1}{4}$ track

Tape speeds :

$7\frac{1}{2}$ ips (19cm/sec)

$3\frac{3}{4}$ ips (9.5cm/sec)

$1\frac{7}{8}$ ips (4.8cm/sec)

Wow & flutter :

$7\frac{1}{2}$ ips : 0.15% R.M.S.

$3\frac{3}{4}$ ips : 0.20% R.M.S.

$1\frac{7}{8}$ ips : 0.30% R.M.S.

Recording time :

96 min at $7\frac{1}{2}$ ips
(stereo 7" 1200ft. tape)

192 min at $3\frac{3}{4}$ ips
(stereo 7" 1200ft tape)

384 min at $1\frac{7}{8}$ ips
(stereo 7" 1200 ft. tape)

Level indication :

VU meter x 2

Output power :

Music: 10W x 2. Undistorted: 5W x 2

Frequency response:

$7\frac{1}{2}$ ips : 20-21,000 c/s

(± 3 db 30-16,000 c/s)

$3\frac{3}{4}$ ips : 30-13,000 c/s

$1\frac{7}{8}$ ips : 30-9,000 c/s

Signal-to-noise ratio: 45 db

Cross talk :

50 db (channel-channel)

Output impedance :

Ext. SP: 8 ohm x 2

Line out: 1k ohm x 2

Headphone: 10k ohm or 8 ohm

Microphone :

Dynamic microphone

Speakers :

4" (10cm) free edge permanent

dynamic speaker x 2

Monitor :

Headphone or speaker

Power source :

AC 100V, 117V, 125V, 220V, 240V

Dimensions :

Main unit 20" (w) x 10" (d) x 16" (h)

Speaker boxes: $9\frac{1}{2}$ " (w) x $5\frac{1}{2}$ " (d) x 16" (h)

Weight :

35.2 lbs. (17kg)

The MR-990 is available from the Sanyo dealer in your area, specially selected for first-class before-and-after-sales service. Or you can write for illustrated leaflet to :

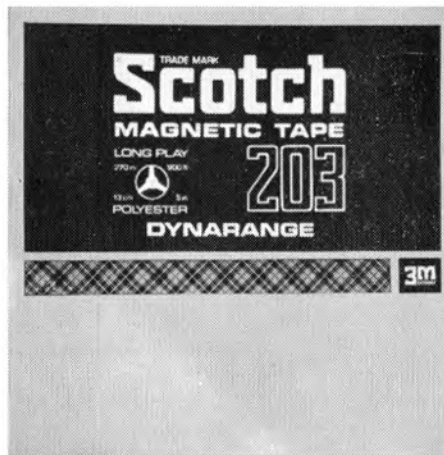
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