

MAY 1970

TAPE

RECORDING MAGAZINE

2'6



SONEX '70

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List

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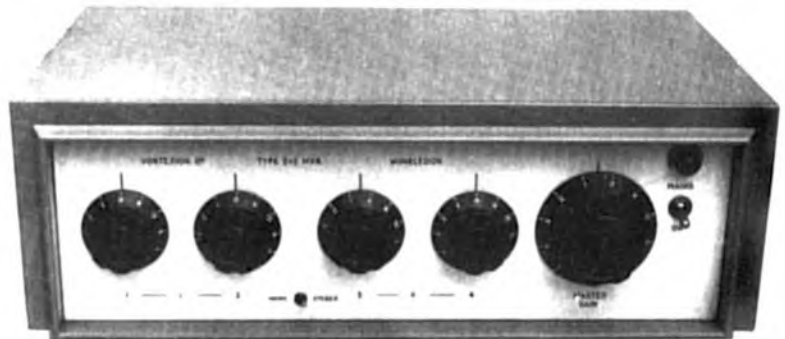
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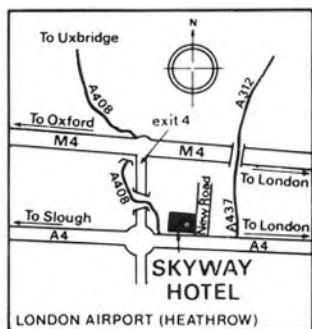
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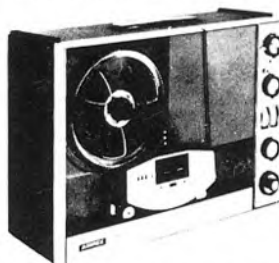
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Ferguson 3232	93	5 0	33	5 0	5	1 10
Sony MR929	97	4 9	33	4 9	5	6 10
Sony TC 252	99	15 0	33	5 0	5	10 10
Philips N4407	103	15 4	33	15 10	5	13 4
Akai 1710L	109	0 0	36	6 8	6	1 2
Sony MR939	112	0 2	38	13 6	6	2 3
Grundig TK247	112	10 0	37	10 0	6	5 0
Sony TC 230	121	11 9	40	11 9	6	15 0
Philips N 4408	136	3 10	46	19 5	7	8 9
Telefunken 204TS	124	19 0	41	19 0	6	13 4
Tandberg 1241X	149	0 0	49	0 0	8	6 8
Beocord 2000K	159	12 0	53	4 0	8	17 4
Beocord 2000T	165	18 0	57	18 0	9	0 0
Akai 1800SD	199	0 0	66	6 8	11	1 2
Ferrograph 722/4	204	16 9	68	16 9	11	6 8
Revox 1122/24	236	5 0	78	15 0	13	2 6
Philips Pro 12	239	0 7	79	13 7	13	5 7

4-TRACK MONAURAL

	Cash Price		deposit		12 Monthly Payments	
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Fidelity Braemar	34	4 8	11	12 8	1	17 4
Fidelity Studio	46	0 10	15	17 10	2	10 2
Grundig TK149	55	18 10	18	18 10	3	1 8
Philips 4307	48	11 11	16	15 3	2	13 1
Ferguson 3228	48	16 0	16	16 8	2	13 4
Telefunken 201	51	9 0	17	3 0	2	17 2
Ferguson 3238	59	12 0	20	12 0	3	5 0
Philips 4308	60	0 10	20	14 2	3	5 7
Ferguson 3216	66	2 0	22	16 0	3	12 2
Tandberg 1541	82	0 0	28	0 0	4	10 0

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Sony TC252	72	15 0	24	9 0	4	0 6
Sony TC355	100	2 6	34	2 6	5	10 0
Tandberg 1641-X	89	10 0	30	0 0	4	19 2
Akai 4000D	89	18 8	30	18 8	4	18 4
Tandberg 62/64-X	157	0 0	52	6 8	8	14 6
Ferrograph 702/4	194	15 8	64	15 8	10	16 8

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Ferguson 3224	33	14 0	11	12 8	1	16 10
Grundig TK120	39	5 0	13	5 0	2	3 4
Tandberg 1521	77	0 0	27	0 0	4	3 4
Beocord 1100	82	19 0	27	13 0	4	12 2
Ferrograph 713	174	13 6	58	13 6	9	13 4

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Philips RR290	31	10 0	10	10 0	1	15 0
Grundig C200	37	17 6	12	7 6	2	0 10
Philips RR482	54	12 0	18	4 0	3	0 8
Telefunken 300 TS	57	15 0	19	5 0	3	4 2
Telefunken 302 TS	68	5 0	22	15 0	3	15 10
Uher 4000L	133	13 1	44	13 1	7	8 4
Uher 4200/4400	162	10 7	54	10 7	9	0 0

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TAPE RECORDING MAGAZINE

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

Vol. 14 No. 5 May 1970

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Cover Photograph: On this month's cover we show the winner of the mammals class in the 3M's Wildlife Sound Recording Contest, Mr E. Legge, of Rose Dene, Morley, Derbyshire.
Readers will be interested to note that his equipment comprises a veteran — and apparently modified — Ficord 1A. This machine has always been a favourite amongst the real light-weight enthusiasts; unhappily it has been out of production for many years now.

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Tape trends and tape talk

By Douglas Brown

A SPECIAL ACCOLADE bestowed by this column this month on Pye for their launching technique with a range of half-a-dozen new recorders. Said the advertising copy: "We want you to take snapshots in sound. We want you to use them every day, to have fun, to be creative . . ."

And Pye offered the customer a brochure developing this idea. It's time someone again put the emphasis on tape recording as a creative activity. I know it's been said before; I know the "sound camera" idea is an old one. But new recruits are coming to this hobby every week in hundreds.

They need to be introduced to its possibilities in simple language. It's a problem we well understand on this magazine: we have to try to cater for the experienced enthusiast who has been recording for years, but we must always remember the newcomer, with a brand-new recorder at his elbow and wanting elementary guidance.

* * *

CONTESTS are, of course, one of the best ways of encouraging creative work. The problem here is to persuade enough people to "have a go". I take the view that some system of local heats might produce the best results. I should like to see the local radio stations, which should now begin to sprout all over the place, arranging local contests, with the best tapes going forward for a national adjudication.

In some parts of the country, where enthusiasts are concentrated, there have been remarkable successes of this sort. I have just heard, for example, from Gordon Furneaux, the honorary secretary of the South Devon Tape Recording Club, who has done well with the first national tape-slide competition. This did not attract a large number of entries, but it did bring the message to large numbers of people in the south-west that there was a satisfying hobby they might take up themselves.

The titles of the programmes entered – "A visit to Cardiff Docks", "Review of the Western Fleet in Torbay, 1969", "Torrington May Fair" and "An afternoon on the Thames" – suggest some of the possibilities.

Winner of this contest was Charles J. Block, of Paignton, with a programme entitled "The Reluctant Gardener". This consisted of 26 slides, including some outstanding close-ups of "creatures" found in his garden, plus a simple, direct sound track made up of humorous prose, written and spoken by Mr Block himself.

* * *

A CONTRIBUTOR to one of the provincial dailies wrote the other day that a tape recorder required a five-minute "service" every time it is used. He was referring to the need for regular cleaning of heads and capstan.

I can't help speculating how many of my readers clean their machines every time they use them!

The *News of the World* has just switched editors. What did ex-colleagues give to retiring Stafford Somerfield when they bade him farewell? You've guessed it. A tape recorder.

* * *

WATCH NEXT MONTH for full details of one of the most important publishing ventures since tape recording became a home hobby – the launching of *The Encyclopaedia of Tape Recording* in regular monthly parts. Each part will be a complete and self-contained work in itself. In two years they will add up to the fullest, most detailed and most authoritative work on the subject ever compiled. The *Encyclopaedia* will appear as a companion publication to *TAPE Recording Magazine*.

* * *

TAPE-AND-SLIDE is a field in which I expect to see big developments. I know one or two tape recording clubs the members of which have done wonders with the technique of several shots in rapid succession, to convey impact. On the Continent, particularly in Belgium, more elaborate techniques have been employed by clubs.

Professionally, the tape-slide show is now achieving a new dimension. The idea is to use a number of screens and a number of projectors and to programme slide changes as well as sound, on magnetic tape.

Several projectors can be focussed on to one screen, each with a light control so that pictures can be faded in or out. Quick "dissolves" from one picture to another thus become possible. If a whole series of screens is employed – and six or nine have been commonly used – images can be switched from one to another, or they can be used together to create one giant image.

The way the professionals do it, it can be very expensive. But there are ideas here that amateurs can follow up at modest cost.

* * *

NEXT MONTH members of the Wildlife Sound Recording Society will be discussing a "code of conduct". It will form part of a proposed constitution for the organisation. The ethical problem that concerns some members is this: should animals ever be placed in captivity in order to simplify recording?

With insects, reptiles and fish the problem, if and when it exists, is not acute. In the case of mammals, it is much more difficult. The Society members may have a fascinating debate.

The Society flourishes, and secretary J. B. Fisher tells me that there are now about 150 members. More members are wanted, provided they are active in the field. Recently there have been regional gatherings at Cambridge, Atherstone, Southampton and in Surrey and North London. The Secretary's address is: Chadwell, Sandy Lane, Rushmoor, Tilford, Farnham, Surrey.

READER SURVEY

WHEN WE asked our readers recently to complete and return to us a questionnaire form we certainly started something. At the moment of writing the staff is struggling for air through a continuing avalanche of paper. The response has been tremendous and we are most grateful to all our readers for their co-operation. Thanks to you all!

As soon as all the replies have been received they will be analysed statistically and the figures will be published, but in the meantime we have been most interested to read some of the very many constructive comments that have been offered. From these there are already signs of definite trends of opinion. The small proportion of readers who complain that we are too technical are roughly balanced by an equal number who think we are not technical enough – those who want less of one particular feature have an equal weight of opinion against them from those who want more of that item. An encouragingly large number say, quite simply, *don't change*.

One of the purposes of the survey was to try to find out whether our editorial content meets the real need that it is designed to fulfil, and the only people who can answer that question are the readers themselves. From replies received so far there is a clear demand for certain features that are not regularly included in the editorial make-up. Most popular request is for constructional articles and we are giving this serious thought. But let's quote verbatim from some of your comments.

The last question, if you remember, was: Have you any special ideas for improving *TAPE Recording Magazine* or suggestions for articles? Here are a very few of the answers with the Editor's remarks in *Italics*.

I think the magazine would be more interesting if there were a lot more articles for younger enthusiasts. *We do try to cater for readers of all ages. Surely young people resent being talked down to?*

As this is now the only magazine on the market covering our hobby please leave its format as it is. Something for everyone. *That is precisely our aim. Glad to hear this reader is happy.*

I would like your section "Nature Notes" given more space and wider appeal to the amateur all over the UK each month. Also hints for the disabled in wheelchairs (like myself) when recording the above. *We regard Nature Notes as being a most important feature and can sympathise with this reader's personal difficulties. This problem will be referred to our author, but in the meantime I would suggest that he writes to Richard Margoschis himself, care of this magazine.*

I don't think TRM can be much more improved. There has been coverage of all the main aspects of recording over the last couple of years, including Electronic Music, Multi-tracking, Techniques, Home Studio and Nature Recording. I would like to see articles on record companies and local radio stations. *Two good ideas that will be kept well in mind.*

More machines similar to the Telefunken M 501 reviewed and more thought given to readers with very limited money. *Actually we do think constantly about readers with limited resources, but we reason that people like to read about equipment even if they can't necessarily afford to buy it. And our machine reviews are selected to cover the widest possible price and type ranges.*

More articles of the Tape Workshop type. *Glad you like it. As time goes on we shall evolve other thoroughly practical series of this kind with emphasis on "do-it-yourself."*

Well really there is no room for any improvement. This magazine is one of the best. If I could personally change the contents of TAPE then I think I would try to make articles interesting in lay-man's language; not that I'm simple but it makes the article more relative to one's own problems. "Sound Sense" was,

I thought, a brilliantly informative article as well as being interestingly written. It's that sort of thing I mean. *Actually as many people have said we are "not technical enough" as have said "too technical." We do try to strike a happy medium in this respect.*

I would like to read more articles on tape recording and the tape recorder. These should be of a semi-technical nature such as owner maintenance etc. How about some articles on the creating of subjects for recording, preparing scripts etc? *Well, all these subjects have been dealt with at different times, but they will certainly be repeated in the future.*

No! *Thanks!*

A Test Bench review of one or two expensive machines . . . *Oh dear! How difficult it is to keep all the people happy all the time.*

No, I like the magazine just as it is covering many and varied topics on tape recording. However I would like to see graphs on equipment reviews as these are easier to read than a line of figures. May I congratulate you on an excellent magazine. *Thanks for the congratulations. So far as graphs are concerned we agree – those who are used to them find them easier to read. But figures can be read by everyone and some people can make no sense at all out of graphs so we use the method that can be understood by all.*

Please publish a list of past machine reviews with the dates of the magazines in which they appeared. *No sooner said than done. The list appeared for the first time last month.*

Perhaps a little more editorial comment on the high fidelity aspects of tape recording. More discussion on professional techniques and how they can be applied to the amateur. *Both these aspects are being kept well in mind, but we have to be careful not to frighten off newcomers to the hobby by giving the professional too much emphasis.*

A LIMITED NUMBER OF COMPLIMENTARY TICKETS TO SONEX ARE AVAILABLE TO READERS FREE OF CHARGE. APPLY ENCLOSING A STAMPED AND ADDRESSED ENVELOPE TO:
TAPE RECORDING MAGAZINE, DEPT S, 16a BEVIS MARKS, LONDON, E.C.3.

SONEX '70

THOSE OF US who miss that great Easter-tide event, The International Audio Festival and Fair at the Russell Hotel, will be looking with curious interest towards the Skyway Hotel on the fringe of London's great Heathrow airport. There, from the 24th to the 26th of April, will be found the first of a completely new series of exhibitions under the title Sonex '70.

This new show has come about as the result of co-operation between a number of our leading manufacturers and distributors of high fidelity equipment. Together they have formed a Limited Company, one of whose objects is to organise and stage this event. As we all know, the Audio Fair had changed its character by amalgamating with the Photo-Cine Fair and moving from a hotel to the larger area of the Olympia exhibition hall. It will be with us again next October in that form. But now we have in addition the prospect of this new function in the Spring.

A glance at the list of exhibitors will give the reader a pretty fair idea of what to expect. Many famous names are there, although it is noted with regret that certain firms in the tape recorder business are conspicuous by their absence. Perhaps they are "sitting on the fence" to see just how successful Sonex will be before committing themselves. One can certainly sympathise with such a point of view. The putting on of two major shows in this country each year represents a formidable outlay in effort and in money. When one remembers that most of these firms also exhibit at international shows abroad as well then their predicament can be appreciated.

It might not be generally realised that the cost to each firm for each exhibition is likely to be in the region of a couple of thousand pounds — in many cases considerably more. Perhaps even more important, key members of the staff have to be drawn away from their usual work to man the stands. Why, then, do they do it?

The purpose of such a show is primarily to increase sales by demonstrating products to the public and to the trade alike. But there is a secondary

consideration too. Such an event provides a valuable opportunity for contact between individual manufacturers and also between them and their more knowledgeable customers. At such times ideas can be exchanged freely to the benefit of all. It is this flow of thought that could be likened to the life-blood of the industry; without it there would be a danger of stagnation.

So, in return for the exhibitors' effort there are two things that the ordinary visitor can do. Firstly attend as many demonstrations as possible, treating each with respect and consideration. Secondly if *you* have any thoughts or ideas that are relevant to any particular product then please don't hesitate to mention them to the company's representative. If enough people all make the same constructive comment about a piece of equipment then that manufacturer is going to think very seriously about it. And this reaction from the public is just what he wants.

In attending demonstrations try to work to a logical plan rather than rushing from room to room without really knowing why. Perhaps time is the key. One must have sufficient time to take in all that one desires to see and hear. And that is almost certainly going to involve devoting at least a full day to the show.

Tickets at Sonex will have to be given up at the door, but replacements will be readily available from the exhibitor's office so do call and get one if you are thinking of returning for another visit.

Remember too that whatever equipment you are listening to, whether it be amplifier, tuner, tape recorder, cartridge or what-have-you, the sound is always the sound from the loudspeaker — not the sound of the appliance directly itself. As loudspeakers, and room acoustics too, have an unfortunate habit of altering the colour and the feeling of the sound we have to be very careful not to assume that any particular demonstration is outstandingly good (or bad as the case may be!) unless the loudspeaker equipment used is also taken into account.

Finally do please ask questions of the staff but be patient if the answers are not always instantly available. Every firm will have technical experts on hand, but these gentlemen do have to eat sometimes . . . It's a great strain to work at an exhibition day after day, answering questions and talking to people. What is appreciated above all else is an intelligent interest on the part of the visitor coupled with good-natured courtesy and a word of appreciation. The people showing their products are doing a lot for us — it's not a great deal for us to do for them.

Buses to Skyway Hotel

Number	Origin	Destination
81b	Hounslow Bus Station	Heathrow
81	Slough	Hounslow
91	Wandsworth Bridge Tavern Via Fulham, Kensington and Hammersmith	Hounslow West
223	Ruislip	Hounslow Bus Station
704-705 Green Line	Marble Arch, Via Park Lane, Knightsbridge, Kensington, Hammersmith	Heathrow Airport, Nth.
Reading B	Victoria Coach Station	Heathrow
Sonex 70 Private Bus	Hounslow West Tube Station	Skyway Hotel



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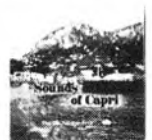
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THE EXHIBITORS
AT
SONEX '70

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LETTERS

from our

POSTBAG

Dear Sir,

Thank you very much for this month's edition of *TAPE Recording Magazine*. As a keen recordist of Bird Sounds several of the articles were of special interest, but primarily I was interested to try to correlate the implications of two articles, namely "Battery Portables" and "Editing and Splicing Compact Cassette Tapes".

My own method of filing field recordings is to record on one track only and to edit by "cuts"; keeping all the required recordings, for later dubbing or editing on a separate spool. The main argument against cassette recorders, apart from questions of tape width and speed and frequency response, has been the necessity to retain the whole track of the cassette for the sake of a few minutes satisfactory recording. I thought that your article on editing and splicing was going to offer a solution to this problem, but you appear only to deal with the question of editing out *unwanted* sections of the tape, whereas I edit out *wanted* sections. Have you any solution to this problem with the cassette type of recorder? How can one store and replay cassette "cuts"?

Yours sincerely,

MALCOLM CLARK

King's Lynn, Norfolk.

Malcolm Clark has raised a very interesting and important point in his letter. Our editorial on splicing and editing Compact Cassette tapes did indeed relate to the cutting out of unwanted sections, but of course the same drill would apply when removing wanted sections. The difference lies in the storage problem rather than in the method of cutting and jointing.

When working open spool with 1/4-inch wide tape the sections edited out for future use are normally wound on to a spare spool and are separated from each other by lengths of leader tape. To the best of our knowledge none of the tape manufacturers is yet offering leader tape in the narrow Compact Cassette size. If this were to be obtainable then the same method could be used as for open spool: the wanted sections could be built up on an empty cassette, each item being separated from the next by leader.

So what about it, tape manufacturers?

Dear Sir,

I should be most grateful for your advice regarding the impedance of microphones.

I have recently purchased a portable tape recorder, a Sony TC 800A, and I should like to equip myself with a better microphone than that supplied with the recorder.

I have been thinking of purchasing an instrument from the firm of A.K.G. as I have been told that their instruments are very sound. The impedance of my recorder is 600 ohms and my dealer tells me that the A.K.G. microphones are of 200 ohm impedance and will not be suitable. Despite this information I received a catalogue from A.K.G. and reading through various microphone specifications I note that although the impedance is 200 ohms the actual load impedance varies from 400 to 500 ohms.

Could you please explain the meaning of this and will microphones of such an impedance match into 600 ohm input or does the matching have to be very exact?

Finally I note in the catalogue that the more expensive microphones have what is termed "a bass cut". Can you please explain this term.

With many thanks,

Yours faithfully,

R. F. DAVID

Giffnock, Glasgow.

This is a not uncommon problem, and the confusion arises because of differences in terminology. If a 200 ohm microphone were to be fed into an input of literally 200 ohm load impedance a loss of signal would inevitably result. Messrs A.K.G. refer to their 200 ohm microphones as being "ideally suited" to a 600 ohm input such as that on the Sony TC 800A.

We would like to add that when selecting a microphone for use with any battery portable care should be taken to ensure that neither the case nor the cable are sensitive to noise transmission when hand-holding.

With regard to the "bass cut" facility sometimes found on microphones, this, as the name implies, is a switching facility that has the effect of attenuating the lower frequencies. Since much of the unwanted noise in battery portable work is made up of rumbling traffic and similar lower register sounds it can be most useful. If the microphone has a switch marked "Speech" in one position and "Music" in the other, then the former is precisely the same; it provides a bass cut and its purpose is to reduce low frequency reflected sound and interference noises. In the "Music" setting the cut is completely removed since for this application the flattest possible response is the best starting point.

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A tape recorder is only as good as it sounds. You know that and so do we. That's why we developed the Automatic TK149—to take the guesswork out of tape recording, to give you that distinct, clear sound for which a GRUNDIG is so justly famous. There's a lot of sophisticated engineering in the TK149 to bring it right up to Hi-Fi standards and, of course, it comes with more than £10 worth of quality accessories. But first things first.

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Level Adjustment: Automatic with the ingenious distortion-free Grundig delay system or manual override.

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Input: Microphone/Universal 2mV/1.5M Ohm

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Hear it all on

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Ferrograph Series 7 tape recorder

Where a tape recorder must be good and reliable, you'll find Ferrographs. In a radio station, for example, tape recorders are in constant use. Technical performance is all-important; absolute dependability and split-second control are essential. So Radio Leeds uses Ferrograph recorders.

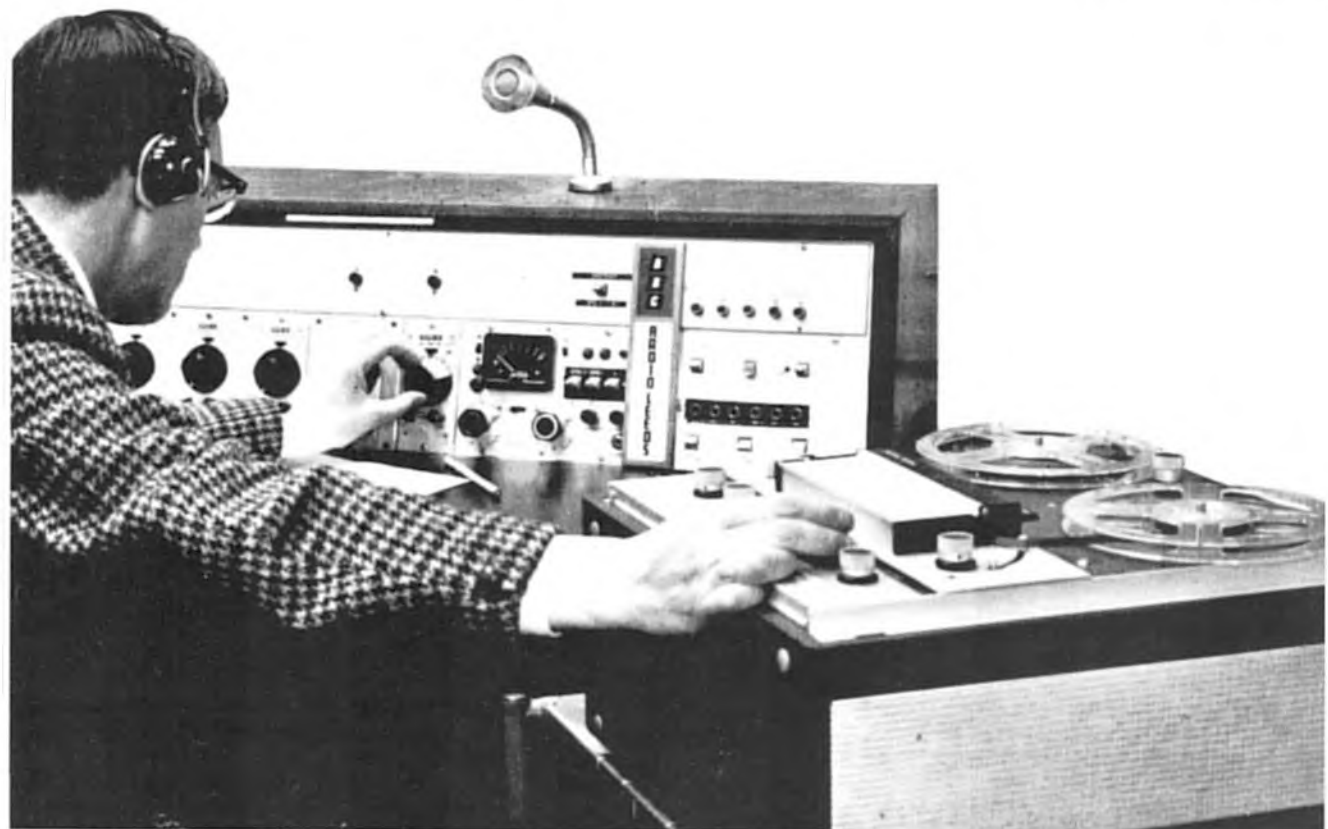
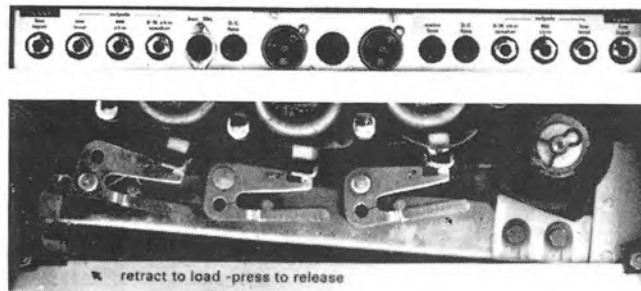
Ferrograph Series 7 tape recorders are British made, available in mono and stereo, with and without end amplifiers. All

instruments are solid state, three speeds. All incorporate an unrivalled range of facilities, including two inputs per channel with independent mixing, independent tone controls on each channel, endless loop, signal-level meters for each channel on playback and record, re-record on stereo models, and many others. The output is 10 watts per channel. Ferrograph recorders are available in elegant hardwood or in a vinyl

case to suit any decor and method of use.

Follow the professionals; choose the recorder you know will serve you best at home and in your work: Ferrograph. Your local Ferrograph specialist will be pleased to demonstrate it to you. Alternatively, please write or ring for details and address of nearest stockist. The Ferrograph Co Ltd, The Hyde, Edgware Road, Colindale, London NW9
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Ferrograph

DURING the last month or two I have been breathing hints about the possibility of attempts to establish new stereo standards which will involve the use of more than the conventional two channels now universally adopted as the domestic norm. Personally I view this development with increasing apprehension.

It would mean using gramophones that will play records using specially encoded signals which will require decoding either in the cartridge or at the amplifier. For radio transmissions in multiple channel stereo one's existing stereo tuner would have to be modified, probably by the addition of an extra decoder; the position with tape is much more simple – all four tracks would be used simultaneously to provide the four quite separate channels.

But if those were to be only problems they would not cause too much concern. Unfortunately that deals only with the first stage of the signals. To hear four-channel stereo we should require an extra two-channel stereo amplifier together with another pair of loudspeakers.

Just when the public are becoming used to the idea that stereo is the only really acceptable way of listening to artificially reproduced sound (at least the majority do, although there are bound to be some die-hards who would love to argue the point!) it now seems that they are about to be utterly confused by the introduction of multi-channel set-ups. And they are going to be frightened by the prospect of ever increasing costs apart from possibly being dissuaded from investing in new gear in case it should be found to be obsolete in a year or two. So let's try to put the whole thing into perspective.

First of all it must be understood that domestic multi-channel stereo is as yet only in the experimental stage. In America certain radio networks are applying for permission to commence broadcasts in what is bound to be finally called "super stereo", but even there no-one other than a handful of technicians has the equipment to receive them. It is just not yet being made commercially. Four-channel gramophone records are already being made in small quantities in the States, but in this country none of the major companies have, to my knowledge, any plans to release other than two-channel records.

It is, however, interesting to note that when CBS recently recorded the Verdi *Requiem* at the Albert Hall they reduced the usual eight-track master tape to a four-channel stereo version; but the record will be issued as normal two-channel and the four-channel copy is destined for storage in the vaults as an insurance against the possibility of

CROSS

TALK

By Audios

commercial developments in the future. When that future is likely to be – if at all – they are not prepared to forecast.

In the world of tape things are not very different. Already there have been a handful of four-channel tape recordings issued across the Atlantic. Because the subject is so interesting Messrs Bell & Howell will be demonstrating the playback of four-channel recordings at the Sonex '70 exhibition using equipment by Acoustic Research Inc. of America. They point out that the demonstration is of no more than academic interest since they have no plans to import or market four-channel equipment in this country at the present time.

That, then, is the multi-channel position. We could say that as a commercial proposition it does not yet exist. As a laboratory investigation it holds many fascinating possibilities but at the present state of the art it is very doubtful if they are of any great domestic significance. To make the idea viable commercially we should have to have very much smaller and cheaper loudspeaker enclosures plus really low-cost amplifiers. Even then the advantages over two-channel systems are likely to be marginal.

I can well remember saying in the early days that good mono was infinitely preferable to poor stereo. Now is the time to say that good two-channel stereo using fine loudspeakers will always be better than any multi-channel system which depends upon cheaper – and therefore inferior quality – loudspeakers.

Before leaving this subject it is not a bad idea to ask oneself why bother with more than two channels at all? The answer, of course, is to endow that artificially reproduced sound with greater solidity; to give it a real "back and front" as well as a left and right. Just as mono reproduced through two speakers sounds better than mono via a single enclosure (although it is still not stereo), so two-channel stereo with the reinforcement of extra loudspeakers could offer improvement over an ordinary two-speaker system. It seems to me that here

lies the real possibility for experiment by the amateur, provided care is taken not to allow the impedance to drop so that there is a danger of "blowing" a transistorised amplifier. Remember that a pair of speakers connected in parallel to the same outlet will *reduce* the impedance, whilst the same pair connected in series will *increase* impedance.

* * *

HAVE YOU noticed how much the quality of radio transmissions seems to vary these days? Every now and then we get a brilliance of sound that is really quite breath-taking. But at other times it can be so bad as to leave one feeling depressed and disillusioned.

To be fair, most of the thoroughly bad broadcasts do originate from gramophone records. This is excusable if the record has a particular historical significance, as many older discs do. But all too often the announcer makes no apology nor offers any explanation. He just introduces the music and leaves it at that. I have even heard an absolutely terrible record referred to as "a superb example of recording techniques".

Who writes the poor man's script, I wonder? And what does he think as he listens to the sound over the monitor speakers in the studio? As a cash customer I know just what I think, and that is unprintable. It's all very odd when you think of the "holier-than-thou" attitude that the B.B.C. adopts regarding the quality of outside tapes. Quality, we are told, is everything. Who is kidding who?

* * *

A NEW COMPANY called Precision Tapes Ltd has been formed to manufacture and market Musicassettes and 8-track Stereo Cartridges. This is a joint enterprise between Pye Records and General Recorded Tapes Corporation of America, and when I spoke recently with the General Manager, Walter Woyda, he predicted annual production figures running into millions of units. With a brand new factory in Essex ready to go into operation almost any day now we shan't have to wait too long before we see this new name in the shops

All the pointers indicate that tape is becoming more and more widely accepted as the home music medium of the future. The gramophone record will not die over-night but during the next five years the emphasis will undoubtedly shift from disc to the newer methods of reproduction.

This will be matched by important improvements in equipment, some of which I do know a little about. Sorry; the only reason I was told of them was because I was prepared to be sworn to secrecy, so they can't yet be passed on. But the moment news is released yours truly will be scribbling like mad.

* * *

THE SOUND CAPSULE referred to in a recent article entitled "Surrounded by Sound" has now been demonstrated at two of the major London stores. A pair of these gadgets has just been received for our investigation and we shall report on them in due course.

* * *

DID YOU hear about the recording enthusiast who, before saying his nightly prayers, was in the habit of checking his lines of communication by repeating: "Testing, testing, testing. One . . . two . . . three . . . !"

THESE QUESTIONS ARE ANSWERED BY BRIAN H. WILLIAMS A.M.Inst.E (of Crompton Parkinson Ltd)

PACKAGED POWER

ONE OF the most significant advances of recent years has been the portability of electronic equipment. Radios, record players and tape recorders have all "gone mobile" thanks to the development of transistors, printed circuits and small DC motors. But that is not the end of the story. At least as important is the tiny package of power required to drive the appliance.

Familiarity can most certainly breed contempt; how many give a second thought to the batteries that are bought for a few pence across the counter of any radio shop? Yet without the technology behind the dry cell we should lack the one essential that makes portability a fact rather than a hopeful dream.

What is known as the "Leclanche" dry battery has been with us since the turn of the century, since when the basic principles of converting chemical to electrical energy have remained virtually the same. The battery makes use of chemical reactions to produce electrical energy so that an electrical current will flow in the external circuits connected to it. But modern production techniques and improved chemical mixes bring more power in smaller packages for the convenience of the user.

There are three factors that will determine the flow of current in a external circuit when it is connected to any given battery. These are: the resistance of the total circuit; the internal resistance of the cell; the period of time used. The latter is most important, forming as it does a highly complex subject which is really outside the scope of this article. However it is interesting to take a look at what actually happens within a cell as it is used and this will help to explain the point in fairly simple terms.

When the external circuit is connected particles of zinc from the can forming the cell container go into solution. This leaves a deficiency of electrons and so produces a flow of positively charged ions to the carbon rod which forms the positive pole of the cell. At this rod hydrogen is released and this causes resistance build-

up, an effect known as "polarisation". This inhibits the flow of ions - therefore of current - and consequently the voltage across the battery decreases. This gradual loss of life is typical of the Leclanche battery and is a phenomenon with which we are all familiar.

That, however, is not the end of the matter. When the battery is rested certain chemical changes take place. The material forming the mass of the battery, known as the "depolariser," is packed around the carbon rod. It absorbs the excess of hydrogen, combining it with its own oxygen to form water. This reduces the internal resistance of the cell and allows more current to be drawn when it is next used.

So we see that the most economical way of using a dry battery is in short periods with long rests between. This is the reason why the life characteristics of dry batteries are always related to specified discharge periods during a twenty-four hour cycle. Generally speaking the continuous discharge of a dry battery is a thoroughly uneconomical method of use, although there are certain applications in which such cells are used successfully in this way.

Most people have suffered at some time or another from the effects of a leaking dry battery. It can leave a nasty, sticky, corrosive deposit that is difficult to remove; in extreme cases it can ruin a piece of equipment. But under normal conditions of use a dry cell should *not* leak, so it is well worth while understanding a few basic facts about the construction of the cell so that if it does happen we know why.

As previously mentioned the fundamental principle of the Leclanche dry cell has not altered since its conception some

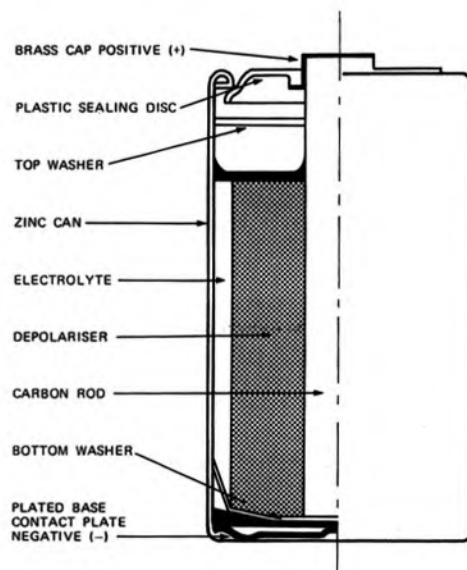


Fig 1. The construction of a sealed round cell showing the zinc can which also forms an outer casing. Particles of metal from this container play an important part in the chemical reaction which produces electrical energy at the terminals.

seventy years ago. The outer zinc case forms an active electrode; in producing energy from a chemical reaction zinc is consumed from the outer can. The cell is designed to allow for the use of this zinc and a safety factor is built in. After all the chemical energy has been converted there is still an adequate thickness of zinc remaining to safely contain the depolariser and electrolytic mixes. But this will only be true if the battery is used in

TABLE 1. - Sizes and international references of some popular cells.

Vidor Reference	Reference STANDARD	B.S.I. & I.E.C.	USA	Size mm. dia. x ht.
HP.2	SP.2	R.20	D	34 x 62
HP.11	SP.11	R.14	C	26 x 50
HP.14	V.14	R.6	AA	14.20 x 50.5

PACKAGED POWER

(Contd)

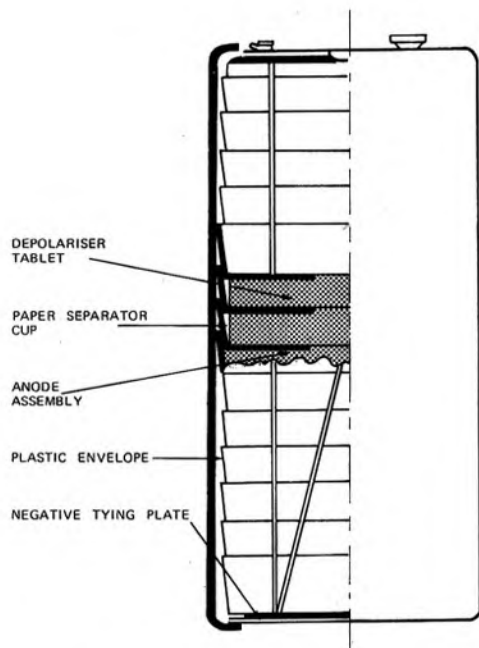


Fig 2. An alternative method of construction, known as the layer cell, has certain advantages. Owing to the individual wrapping of the cells the zinc plate no longer has to serve as a container so there is less chance of leakage.

accordance with the manufacturer's recommendations for the purpose specified. As a safety precaution batteries should always be removed from equipment that is not going to be used for an appreciable period of time.

From the point of view of the conversion from chemical to electrical energy there are three basic types of batteries, and these are designed for lighting, transistor and power applications. In the accompanying Table 1 it will be noted that the physical size of both Standard and High Power batteries is the same for similar kinds. The list gives the British Vidor references together with the U.S.A., I.E.C. and B.S.I. equivalent type numbers.

We show in Fig. 1 a detailed sketch of the construction of a sealed round cell

TABLE 2. — Discharge data based on a small DC motor whose speed remains virtually constant over the voltage range of 6.5 to 9 V at a current drain of 50 mA.

Type	Voltage	Discharge Period	Expected Life E.P.V. of 6.5 volts
VT.9	9V	2 HRS/day	50
VT.9	9V	4 HRS/day	40
VT.7	9V	2 HRS/day	25
VT.7	9V	4 HRS/day	10

unit. There is no physical size difference between this and the Standard unit, but different chemical compounds are employed. In the High Power unit more refined mixes, such as electrolytic Manganese Dioxide, are used. Together with certain other factors, these refined chemical mixes allow the internal impedance of the cell to be reduced, thus allowing greater currents to be taken whilst the voltage still remains comparatively high. It therefore follows that High Power batteries are recommended for use in small DC motor applications such as tape recorders.

At the present time there are two ways in which a Leclanche battery can be manufactured. We have already mentioned the round cell; the other is the *layer cell*. Chemical reactions are the same; the only differences lie in the method of construction. Whereas the round cell is made concentrically the layer cell is flat, as is shown in Fig 2.

There are certain advantages in using the layer method of construction. Square or rectangular batteries can be built up

out of multiple cells without wasting space; thanks to the wrapping of individual layer cells and the overwrapping of the entire stack the zinc plate is no longer the container and so the battery is more resistant to leakage; there are only two terminals for the complete battery thus eliminating separate cell containers and spring contacts and so reducing the overall battery circuit resistance. The stacked layer battery is square or rectangular in shape, and typical discharge data is given in Table 2 which is based on a small DC motor whose speed remains virtually constant over the voltage range of 6.5 to 9 V at a current drain of 50 mA.

To get the best of both worlds some appliances use a combination of stack layer batteries and round cells. Typical is the case of the latter driving a small motor whilst the former supplies power for electronics, such as an amplifier. The careful selection of batteries can result in considerable space saving and improved performance. For example, two Vidor HP

Please turn to Page 171

TABLE 3. — Discharge period per 24 hours: 2 hours per day. This table shows the relationship between current drain and expected life in the two different kinds of batteries used in a single appliance.

MOTOR DRIVE		EXPECTED LIFE in hours to E.P.V. of 1.0 V/cell	AMPLIFIER CIRCUIT	
Type — Vidor HP.11	Type — Vidor VT.3		Type — Vidor VT.3	Type — Vidor VT.3
Volts — 1.5			Volts — 9v	Volts — 9v
Current mA		Current mA	Current mA	
50	54	6	6	
75	30	8	8	
100	23	11	11	
150	10	17	17	

SONY

Sound heart for your sound system . . . The Sony TA-1010 stereo amplifier provides a powerful and reliable hi-fi centre-piece at moderate cost.

This solid-state unit employs high quality transistors for trouble-free, reliable operation, and a rated output of 15 watts per channel ensures smooth amplification over a wide frequency range. A full selection of input/output facilities, including headphone output, provide complete freedom to create the sound system of your choice.

Model TA-1010 – the perfect choice for discerning listeners.

Recommended retail price £59.15.0

GENERAL

Circuit 20 transistors, 5 diodes.

Power requirements AC 100, 117, 220 or 240V, 50 or 60 Hz.

Power consumption Approximately 75 watts.

AC outlets Two switched, one unswitched, total 300 watts.

Dimensions 16 $\frac{3}{8}$ in. (w) x 4 $\frac{7}{8}$ in. (h) x 9 $\frac{1}{2}$ in. (d).

Weight 10 lb.

POWER AMPLIFIER SECTION

Power output Rated output, 15 watts per channel both channels operating.

Harmonic distortion Less than 0.5% at rated output (at 1 kHz).

Intermodulation distortion (60 Hz : 7 kHz = 4 : 1)
Less than 1% at rated output.

PREAMPLIFIER SECTION

Frequency response Tuner, Aux-1, Aux-2, Tape: 20 – 60,000 Hz 0 dB;

Phono-1, Phono-2, RIAA equalization curve \pm 1 dB.

Tone controls Bass 100 Hz \pm 10 dB; Treble 10 kHz \pm 10 dB.

Filter High filter 6 dB/oct. above 5 kHz.

Loudness control 100 Hz + 8 dB, 10 kHz + 4 dB (Att. –30 dB).

Signal-to-noise ratio Phono-1, Phono-2, better than 70 dB, 3 mV; Tuner, Aux-1, Aux-2, Tape, Rec/PB, better than 90 dB, 250 mV.

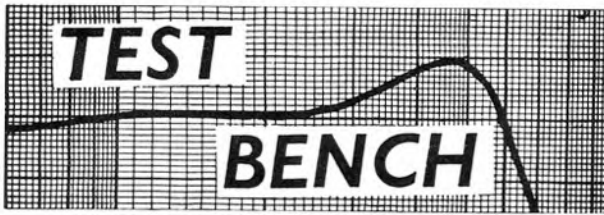
Supplied accessories Plug, polishing cloth.

Optional accessories Stereo headphones DR-4A, DR-5A (low impedance), DR-4C (high impedance), Rec/PB cord, connecting cord RK-74, RK-81.



SONY

RESEARCH MAKES THE DIFFERENCE Sony (UK) Ltd, Ascot Road, Bedfont, Feltham, Middlesex



SONY TC-800B



MANUFACTURER'S SPECIFICATION

Sony TC-800B

System: 2 track monaural recording & playback.

Semi-conductors: 16 transistors, 9 diodes, 2 thermistors, 1 IC for microphone section.

Reel capacity: 5" (13cm.).

Tape speeds: 7½, 3¾, 1⅞ & 15/16 ips.

Frequency response: 30 - 18,000Hz at 7½ ips, 30 - 13,000Hz at 3¾ ips, 30 - 7,000Hz at 1⅞ ips, 30 - 4,000Hz at 15/16 ips.

Speaker: 3 1/8" x 6 1/4".

Power output: 1 watt.

Input jacks: External microphone, 600 ohms, 0.19 mV; Auxiliary input 100kohms, 0.062V.

Output jack: Monitor earphone, 8ohms or 10kohms: 0.775V at 10kohms.

Power requirements: AC110, 120, 220 or 240V, 50 or 60Hz, DC12V (8 "D" size batteries or car/boat batteries).

Dimensions: 12¼ inches (w) x 4 3/16 inches (h) x 10¼ inches (d).

Weight: 11lb 13oz including batteries.

Supplied accessories: Microphone F-26S, 1. Reel R-5A, 1. Magnetic earphone ME-20A, 1. Connecting cord RK.69, 1. Sony battery, 8. Demonstration tape, AC power cord, Head cleaning ribbon, 1.

Recommended Retail Price: £86.15.0d. including purchase tax.

Distributors: Sony (U.K.) Ltd., Ascot Road, Bedfont, Feltham, Middlesex.

INVESTIGATED BY R. HIRST AND D. KILLICK

SONY TC-800B TEST CHART

Frequency Hz	Overall Response dB				Playback Only dB	Signal/Noise Ratio dB	Distortion %	Crosstalk dB
	7½ips	3¾ips	1⅞ips	15/16ips				
30	-4.8	-6.0	-5.8	-6.4				
40	-2.0	-4.0	-4.3	-5.0	-2.4			
50	-1.0	-2.6	-3.0	-4.2	-1.8			
60	-0.5	-1.2	-1.8	-2.8	-1			
100	-0.5	-0.8	-1.2	-2.8	0			
250	-0.5	-1.0	-1.2	-1.8	-1.5			
500	-0.3	-0.8	-0.8	-0.8	-1.0			
1000	0	0	0	0	0	51	3.4	55
2000	+0.3	0	+0.4	+0.5	+0.5			
4000	+1.0	+1.2	+2.2	0	+0.8			
6000	+1.3	+1.8	0	-4.2	+1.0			
8000	+1.9	+2.4	-3.8		+1.4			
10000	+2.4	+3.0			+1.8			
12000	+2.8	-0.2			+1.2			
14000	+3.0	-4.0			+0.5			
16000	+1.0				-1.2			
18000	0				-3.6			
Wow & Flutter								

NOTES. - The Overall Response figures relate to record and playback. Playback only relates to the reproduction of a DIN calibration tape.

For Signal-to-Noise Ratio the tape was recorded at 0VU plus 6 dB 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.

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.

WE REALISED the other day how easy it is to fall into error through clinging thoughtlessly to preconceived ideas about what is right and what is wrong in tape recorder design. For instance, it has long been our opinion that it is very bad practice to attempt to build a microphone into a machine. It has been tried in the past, and as might be expected the microphone picked up all the vibration and noise transmitted directly to it by the mechanics of the recorder. In fact in Tape Workshop we have been stressing the need to separate the microphone from the machine as far as possible to avoid such interference.

Variable speed is another *bête noir*.

Above all else a tape recorder should have a fixed and constant standard speed - without it one would never know for certain if tapes were running fast or slow and the resultant changes in pitch would be disastrous.

But now we have for review a half-track, four speed (7½, 3¾, 1⅞ and 15/16ths ips), mono mains/battery portable that includes both a built-in microphone and a variable speed facility. To our chagrin we found that both of these features not only work extremely well but they also confer a number of advantages. So we were wrong all the time . . . !

Not really, because our complaint in

the past has related to the way in which these "extras" have been provided. In the machine now under examination, the Sony TC-800B, all the problems associated with variable speed and built-in microphones have been taken into account and overcome. More about these unusual features when we come to the user section of our review, but first let's take a look at the technical performance of the machine in the laboratory.

Beginning with frequency response it will be seen that we have checked the overall figures at all four speeds. The claimed specification quotes frequency ranges without giving any tolerances, so we must again point out that when

published in such a way they are quite meaningless. Why be coy when there is nothing to hide? Our test chart shows that at 7½ ips the overall response is flat to plus or minus 3 dB within the range 40 to 18,000 Hertz and we suspect that all Sony's response figures relate to that tolerance. Why not say so? For a battery machine in this price range the performance is exemplary and one would think that the manufacturer would be delighted to shout the facts from the roof-tops instead of hiding his light under a bushel.

Reproduction of a DIN calibration tape shows that the playback curve is virtually flat within 2 dB over the range 40 to 16,000 Hertz. Nothing to be ashamed of there, either. Quite the contrary, in fact.

For signal to noise and distortion our readings were taken when a 1,000 Hertz tone was recorded at 6 dB above the zero mark on the meter in the machine. This gave us 51 dB for the former and 3.4% RMS for the latter. Both are excellent for portable equipment. Crosstalk at 7½ ips (measured at the same level) was shown to be 55 dB, which again is first-class. But the really outstanding feature lies in the wow and flutter readings. These are: 0.08% at 7½ ips., 0.12% at 3¼ ips and 0.18% (!) at 1¾ ips. Here we are up to the highest domestic standards to be found in the heaviest and most costly mains equipment. To reach these fine limits in a battery portable is an achievement of some magnitude. Congratulations, Sony!

This improvement in the mechanical department of tape recorders is something that had to come. There is no point in improving heads, electronics and tape if we are left with nasty wobbles in the sound that is produced. It was inevitable that the mechanical engineers would have to catch up with their electronic colleagues and give us acceptable limits of speed stability. In the Sony TC-800B they have done just that.

Last two measurements showed that the output power is 0.75 Watts RMS for 5% distortion. The claim is for 1 Watt maximum so this could be regarded as confirmed. A degree of tonal control is provided by means of a single knob which operates as a top cut giving attenuation of up to 12 dB at 10,000 Hertz at its maximum setting.

Only complaint so far is that insufficient information is given in the technical specification. The result of our own examination shows that this machine is working to top domestic performance standards, and in fact closely approaches a professional specification for battery operation. All of which encouraged us to pursue our user investigation with hopeful enthusiasm.

After being used to the smaller battery machines we first found the size and weight of the Sony TC-800B to be something of a disadvantage when maximum portability is required. The machine measures 12¼-inches by 10¼-inches and tips the scales at a few ounces under 12 lbs. including batteries. That's quite a chunk of equipment to lug around but all is forgiven when these physical characteristics are related to technical performance. Those very fine wow and flutter figures could not have been obtained without incorporating some pretty hefty mechanical components, so we shall certainly not complain about that.

It is felt, however, that we could legitimately criticize the general layout of controls. This machine is fitted with small, non-scratch feet, and is most conveniently used when placed flat on a table. The Record Level Meter, Gain Control and tape transport keys (Rewind, Run, Fast Forward and Stop) are all positioned on the flat upper surface. If the equipment is shoulder slung (the leather carrying case is an extra) the only controls that are visible and immediately accessible are the Playback Tone and Volume, together with a third knob called "Speed Tuning." More of this one later.

If all the controls had been placed on the upper edge it would have made the machine much more useful for shoulder-slung operation, and this, after all, is the usual position for field working of battery portables. But, and it is a big but, the TC-800B has obviously been designed to be as versatile as possible (why else include the speed of 15/16ths ips?) and there are many applications where the machine would best be working standing on a table like mains equipment. In fact by merely connecting the mains lead supplied to an appropriate power point it *becomes* a mains machine. Versatility must result in compromise and in this machine what we might call "orthodox" field use has taken second place to less specialised applications. Which, of course, is likely to suit quite a lot of people very well indeed.

Before leaving this important matter of layout and convenience of use it should be pointed out that to get this standard of technical quality at 7½ ips in a battery portable one would expect to have to pay a great deal more for the machine, and even then the control layout might not be perfectly suited to the user's requirements. So in the compromise we have lost in convenience but gained in performance, and that is a balance with which we would not quarrel.

Earlier we mentioned the snags of providing a built-in microphone. Sony have successfully included a microphone

(described as condenser!) within the casework of the TC-800B and all that is visible is a tiny, ray-shaped cut-out on the upper deck plate. Beside it is a slide switch marked: Ext., Mix and Int. These three positions provide for cutting out the internal microphone completely and routing in the externally connected accessory microphone provided, mixing both internal and external microphones, or, in the Int. setting, using the internal microphone only. So the operator has complete choice and absolute control.

Also on the upper plate is another three-position slide switch giving a choice of Automatic Gain, Music; Automatic Gain, Speech; Manual Override. Again absolute choice and control.

A recessed panel in the right-hand side carries the input and output sockets, all miniature jack, and gives facilities for the connection of external microphone with remote control, monitor through the earpiece provided and line in. Another three-positioned slide switch in this panel gives two levels of power at the external speaker or cuts it out completely.

Returning to the upper surface of the machine we have a three-digit counter with re-set button, a battery check press-button (visual indication on the meter when depressed) and a large red-coloured slide key for Record. The hinged lid (plastic) contains a transparent panel through which both the 5-inch spools are visible so that tape can be checked, and also beneath this lid is the speed change switch giving the choice of the four operating speeds.

Just one other control, and a very vital one. A slide switch adjacent to the Speed Tuning knob says simply "Off" in one position and "On" in the other. This cuts the variable speed facility in or out during playback; on record the running speed is *always* standard.

This is absolutely the right way to provide for variable speed. Its operation is confined to changing the speed of the playback of previously recorded tapes, which is presumably why it is referred to as "speed tuning." Ideally it should never be needed, of course. If all tape recorders were to always run true it would be superfluous. But in this less than perfect world it sometimes happens — particularly in battery operation — that due to loss of life in the cells a machine runs a little slow. On playback the sound would be gabbled and high pitched. Simple adjustment of this knob on the Sony would bring the recording back to normal. Not a control that one should need to use very frequently, but what a delight to have it right there when wanted. Without it nothing can be done at all to improve the quality or intelligibility of tapes recorded at non-standard speeds.

Curiosity prompted us to experiment first with the built-in microphone. So after lacing up a new tape (Sony PR150 or Scotch 215 is recommended on a boldly printed slip accompanying the instruction booklet; this information is now given as a direct result of a criticism in one of our past reviews and we must compliment Sony for acting so quickly and efficiently on our suggestion) we switched to internal microphone and to music on the AGC and played a few bars on the piano. The instrument is an upright and we merely placed the machine on the floor beside it. Running on batteries there were no wires at all – cordless operation, in fact.

The resultant quality both surprised and delighted. It really was first-class. Of course we were not attempting a “hi-fi” job, but when the signal was fed via a main amplifier to a full-range loudspeaker we were very impressed indeed by the lack of background noise and the fidelity of the sound. It was truly remarkable. The AGC handled the signals well and if we had not known that the recording had been taken on the internal microphone we just should not have believed it.

Although the internal loudspeaker is good – very good for a portable – it does have an inevitable “boxiness”; the audio quality that the machine is capable of producing (even when using the internal microphone!) fully justifies the use of top loudspeaker equipment. The accessory microphone provided gives a markedly

different sound quality, in particular it handles the lower frequencies rather better.

When one considers that top grade microphones tend to be fairly costly pieces of equipment one cannot expect too much from the “give-aways” included in the price of a machine. With the Sony we have two, one internal and one external. Both are very good for what they are, but the enthusiast for fidelity would probably want to buy one of the better accessory dynamic microphones, and such an instrument costing around £15 would enable the TC-800B to function up to the high standards required by broadcasting authorities for outdoor work. Its performance would also delight the hearts of some of our wildlife recordists, although they might find the control layout to be a slight disadvantage.

Whilst we would congratulate Sony on the wide range of accessories supplied and included in the purchase price it does seem to be rather a pity to have to spend another £11.2.6d. on the optional leather carrying case. But as the machine itself represents such extremely good value for money one should not grumble too loudly.

We have rarely come across a machine that is so generally useful as the TC-800B. It is not difficult to imagine it being brought into service for all manner of business uses quite apart from its entertainment applications. With the very

slow tape speed of 15/16ths. ips there is a potential recording time of six hours on a single spool of tape. With its built-in microphone it would be ideal for recording discussions or meetings, not to mention ordinary dictation. At the flick of the speed change switch we could be hearing some excellent music at 7½ ips and when that begins to pall we could go out and about secure in the knowledge that the quality of location recordings will be as good as they would have been if we had taken a heavy mains machine along.

All this is a very great deal to pack into a machine weighing less than 12lbs. We can only summarise our opinion of the TC-800B by saying that its excellent technical performance is only exceeded by its extreme versatility. It will undertake any task required of a small battery tape recorder with a quality standard comparable to that of heavy, mains equipment. In many ways it offers unique facilities; in fact it is a really surprising instrument. By importing it into the UK Sony have filled what has for too long been a gap in the range of available tape recorders. It brings the advantages of 7½ ips battery operation within the reach of many for the first time whilst also offering a compact, self-contained recording system for those who object to trailing wires all over the place. We have no doubt that the TC-800B will very quickly acquire the popularity that it so well deserves.

BOOK REVIEW

Science Tapescripts by Charles Parr published by Methuen Educational Ltd. 7s 3d each.

Biology Today, *Science at Work* and *Science in the Modern Age* are the first three titles in a new series of books by the well-known BBC producer, Charles Parr. As their name implies each volume comprises a number of scripts specially written and prepared for amateur recording by schools, clubs or other groups.

The author has approached his task with an extensive background of educational broadcasting behind him. Well aware of the practical problems involved he introduces each with detailed hints on “How to record your Tapescripts”. Here we have practical guidance dealing with sound effects, open air atmosphere, telephone distortion, cross-fade, echo, mixing, what is called “the impossible elephant” and noises for sale. Following this introduction each volume contains half a dozen separate scripts, each averaging some ten pages.

A glance through the sub-titles of the first book, Tapescripts No. 1 entitled *Biology Today*, gives a fair idea of the scope of the work. The scripts in this volume include: *Animal Navigation*, *Insects and Birds*; *Animal Navigation*, *In Rivers and Seas*; *The Big Game Hunters*, *The Fight Against the Common Cold*, *Memory* and *On the Borderland of Life*.

Great care has been taken to treat each subject in such a way that the educational points are clearly brought out with considerable emphasis. Here we do not have “facts taught” but rather facts learned through unconscious assimilation due to interest.

Even when just reading through these books one cannot help acquiring knowledge. Did you know that the sense of smell plays a vital part in guiding the salmon back to its spawning ground – the river where the adult fish was itself first hatched? This is just one of the fascinating scientific investigations re-enacted in the pages of the Tapescripts. What child would not be thrilled to play the part of a real research worker, speaking with authority and assurance as he reads the words written by Charles Parr?

There has long been a need for books of this kind. The present series fulfil their function admirably by providing varied interest, small casts and a selection of subjects that must stimulate the imaginations of those who take part as well as those who listen to the finished programmes.

Most schools have at least one tape recorder. In Sweden the aim is to provide not one machine per school but *one tape recorder for every classroom*. But then the Swedes have long been leaders in the field of audio-visual aides to teaching. By comparison we in the United Kingdom are but poorly equipped; but now with the advent of these excellent little books – offered it will be noted at the most modest of costs – there is no reason why ambitious recording projects should not be undertaken whenever a tape recorder is available.

We shall look forward to reading more of these Science Tapescripts as new titles in the series appear, but in the mean time would strongly recommend all who are looking for professional scripts for recording to invest the few shillings that these volumes cost. They are first-class value for money.

ACCESSORY REVIEW

BOWERS & WILKINS DM1 MONITOR LOUDSPEAKERS

IT HAS LONG been accepted that audio quality in absolute terms of high fidelity can only be obtained through the use of full-range loudspeakers. Unfortunately by their very nature these enclosures are bound to be both large and costly. On the other hand there is a strong demand for the smaller so-called "bookshelf" systems because (in theory at least) a stereo pair can be more easily accommodated within the home and the cost is usually much less formidable.

The ideal loudspeaker should be tiny in size, moderate in cost and perfect in performance. As the small boy said when first shown a giraffe, "There ain't no such animal!" As a general rule we find that as

MANUFACTURER'S SPECIFICATION

Bowers & Wilkins DM1 Monitor Loudspeaker

System: Three unit comprising bass mid frequency, wide dispersion, high frequency and ultra high frequency.

Crossover & Filter: Full section networks to feed each unit.

Cabinet: 12mm laminated hardwood, veneered outer and inner surfaces and braced. Choice of teak, walnut or rosewood.

Acoustic Loading: Infinite baffle with membrane "Q" controller.

Power Handling Capacity: 10 Watts RMS

Distortion (Dtot): Typical published figures claim 1.0% at 500 Hz and 0.7% at 10 kHz.

Polar Response: Off axis response 60 degrees arc within ± 2 dB on axis response 40 Hz to 20 kHz.

Frequency Response: Better than 5 dB 100 Hz to 25 kHz.

Impedance: 8 Ohms nominal, not falling below 7 Ohms; suitable for all amplifiers.

Dimensions: Height 16½ inches by Width 8 inches by Depth 8 ½ inches.

Net Weight: 15 lbs 2 ozs.

Recommended Retail Price: £32.

Manufacturers: B & W Electronics, Littlehampton Road, Worthing, Sussex.

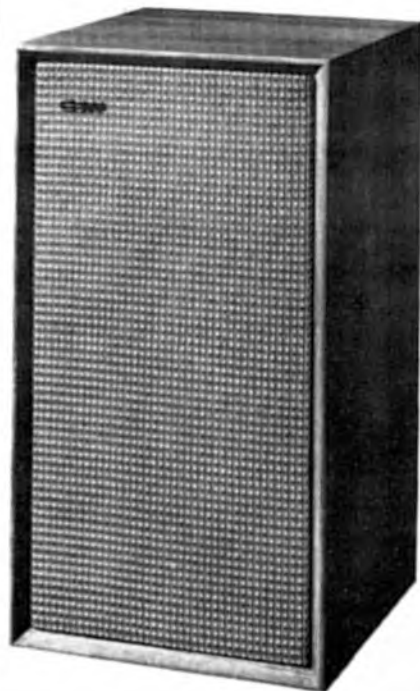
enclosures get smaller and as prices are reduced the audio quality becomes less and less acceptable. But if the ideal loudspeaker is impossible then at least we should be able to consider an "ideal" compromise; a small enclosure giving very nearly as good a performance as its bigger brothers with a price ticket that does not immediately send the customer into a dead faint. If quality is put before price would it be possible to produce a conveniently small system that would really satisfy the critical audio enthusiast yet at the same time still be within his means? It was reasoning such as this that lead to the design and eventual marketing of the Bowers & Wilkins model DM1 Monitor Loudspeaker.

Based on a cabinet volume of little more than half-a-cubic-foot (0.65 cu. ft.) the DM1 is a true three-unit system using a 10-inch by 6-inch elliptical laminated glass/metal cone for the bass radiator. This transducer is manufactured for Bowers & Wilkins by E.M.I. Ltd but has been slightly modified to improve performance. As this unit handles both the low and lower-middle range frequencies the crossover frequency is 4.5 kHz. Upper mid frequency is handled by a wide dispersion pressure unit followed by a low diaphragm mass direct radiator to cover ultra high frequencies and so extend the response smoothly into the supersonic region. The two latter are identical to those used in the larger B. & W. DM3 Monitor enclosure, except that the magnet assembly on the HF unit is slightly smaller to give a required 2 dB reduction in sensitivity.

A great deal of time and attention was given to the design and construction of the crossover network. For the sake of permanence and stability under AC working conditions polyester capacitors are used throughout instead of reversible electrolytics, and the inductor coils are ferrite cored. This assembly has increased production cost but is regarded as essential to quality equipment.

In his technical press release the manufacturer gives a detailed exposition of his researches into the subjective results of actually using loudspeakers under normal room conditions as opposed to theoretical results obtained within the controlled environment of an acoustically dead measuring chamber. The size of the listening room, its furnishing and wall finishes and the position of the enclosure within the room will all modify performance. All these factors have been taken into account in the design of the DM1.

In general appearance the DM1s differ little from other enclosures of similar dimensions. When first delivered we at once realised that small systems are not *always* easier to position than the larger,



free-standing units. A problem arises if one does not have shelf space available at the right points within the room. Ideally the enclosures should stand at a height roughly level with the listener's ears when seated, and to take maximum advantage of room acoustics corner positions are preferred (provided the room is not exceptionally large). It took us a little while to rearrange furniture to give the necessary support at the right places, so we have suggested that fixing brackets might be designed and sold as extras so that the speakers can be easily affixed to walls.

However, having once overcome this small difficulty we settled down to form some opinion on the performance standard of these little fellows. Whilst such comments can be no more than a personal reaction the writer is absolutely confident that his impressions in the present case do represent valid statements of fact rather than hopeful imaginings. To check a special visit was made to the factory where, thanks to the courtesy of the manufacturers, facilities were made available for carrying out comparative listening tests against their other units including the new Model 70, an enclosure using both electrostatic and dynamic drive units and costing £139.10.0. There could hardly be a more critical test than that!

What sent us chasing all the way to Worthing to investigate further was the truly outstanding sound quality produced by the little DM1s. With a clarity and "musicality" never personally heard before from an enclosure of this size (or price) it was felt that readers of this

review would be most interested in our comparative assessments of quality differences between these (£32) units and their very much more costly stable-mates. Apart from which we were very curious ourselves . . . !

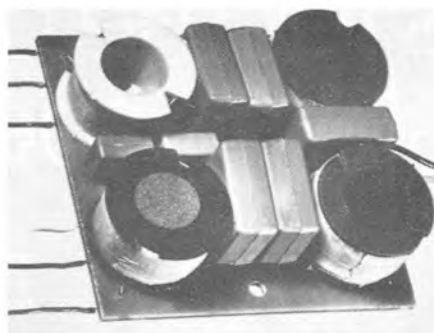
But first to return to the DMIs. It required only the first few bars of a familiar record to reveal a delightful freedom from coloration, a silky smoothness in string tone and capable handling of transients to make us aware of a standard of reproduction very much higher than that to be expected from a system of these dimensions. On spoken word the human voice (male) was found to be free from "chestiness" and in recordings of applause and orchestral tuning there was a reality and sense of presence that made it hard to believe that the little DMIs were indeed the enclosures being heard.

Every individual unit sold is offered complete with its own B & K calibration certificate — a service believed to be unique to this firm. A glance at the curve — very similar for both the speakers in the stereo pair — showed a steep fall in output below 100 Hz. This confirms previous opinions that it is quite impossible to maintain a flat response into the lowest frequencies when using a box of small cubic capacity. To investigate the subjective effect some records of church organ music were played and these did give a less solid bass than that to which we have been used to listening. This, however, was only obvious during direct comparative tests and we suspect it would not be noticed by the majority of listeners under normal conditions.

Fascinated by the quality we listened to a diverse selection of recorded sounds, including full orchestra, various solo instruments, choral records and finally solo singers. In every case our first impressions of excellent audio quality were confirmed. In fact the DMIs are preferred to a number of larger and more expensive enclosures, we have heard.

But they are the least costly in this manufacturer's range, so how do they compare with his best? After a very long session in the Worthing demonstration room we know some of the answers.

By means of direct comparative switching we were able to establish that the Model 70s *do* give a rather more "effortless" sound with a firmer bass response. In addition the dearer speakers give a greatly improved spread to the sound. But it takes an expert ear to detect and recognise these differences immediately; after an hour or so we could say with conviction which unit was being played, but the remarkable thing was how very closely the smaller unit resembles



The crossover network in the DMI enclosure has been designed for long and efficient service. Mounted on a board the components include ferrite cored inductor coils and polyester capacitors.

All enclosures are supplied complete with a calibration certificate prepared on B & K test equipment, a service believed to be unique to this manufacturer.

the larger in performance.

In our opinion the greatest advantage in the Model 70 lies in its ability to spread the sound. The DMI does have, by comparison, a directionality that requires careful placing for best results. We believe that the loss of lowest frequencies is generally less important than the projection of the sound into the listening area over the widest possible arc. This is one reason for the curved shape of the electrostatic unit in the larger speaker. But we reasoned that directionality might be overcome by using additional loudspeaker units within the listening rooms, and in fact such a method might well give greater "solidity" to the sound than could be achieved by using a conventional stereo pair, whatever the size or shape of the enclosures. Thanks to the co-operation of Mr John Bowers, Managing Director of Bowers & Wilkins Ltd, we have been loaned some extra enclosures so that we can investigate and report in due course on our findings.

Before leaving this subject of directionality let us make it clear that *all* normal cone loudspeakers have this failing to a greater or lesser extent. In the DMIs we only found it disturbing when actually moving about in front of the speakers as they were reproducing. Properly placed, with the listener seated in an appropriate position, no unpleasant effect could be noted at all.

In conclusion we can summarise the DMI enclosure by describing it as the very best we have heard within its size and price range, having as it does a performance standard higher than that sometimes found in larger systems. We believe it represents a very sincere attempt on the part of its designer to offer better sound quality than was ever before possible at this sensible price through the use of a cabinet of sensible size. In this aim he has succeeded brilliantly. D.G.K.

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11s. will provide 3 Volts for motor drive whilst a single Vidor VT 3 will apply 9 Volts to the amplifier circuit. Care is also needed to ensure that the types selected will both reach their end point voltages at approximately the same time to allow for the convenience of a complete battery change. Typical discharge characteristics are shown in Table 3.

What are the factors that have to be taken into account when deciding on the final choice of batteries for a given piece of equipment? Very briefly they are as follows:

- a. Current drain required from battery

- b. Voltage required
- c. Space available for the battery housing
- d. Temperature of operation
- e. Period of time the equipment is to be used in twenty-four hours
- f. Availability of replacement batteries
- g. The voltage at which the equipment ceases to be effective or efficient; this is not necessarily the point at which the cell or battery ceases to produce energy effectively (E.P.V. or End Point Voltage) normally given as 0.8 Volts per cell.

The link between a, b and c is very important since this interdependence often means that a compromise must be

adopted. Generally speaking one can say that the larger the cell the greater will be its capacity, whilst the higher the voltage required the greater will be the number of cells needed. In commercially manufactured equipment all these criteria are carefully considered at the design stage, but the same rules apply when the enthusiast is thinking of modifying or altering the power supply to existing equipment for any reason.

A wide range of packaged power units is currently available; the use of the right battery or batteries based on the above will be a significant factor in ensuring the efficient and economical operation of portable reproduction equipment.



NATURE NOTES FOR MAY

BY RICHARD MARGOSCHIS

LAST MONTH I told you about the competition which the B.B.C. is holding this year; now I have some more jolly good news for you. The 3M's Scotch Wildlife Recording Contest is to be held again in 1970. Soon after the judging of the 1969 contest was completed I heard from Bill Bowles, Public Relations Executive of the 3M Company who manufacture Scotch recording tape, that they were prepared to sponsor the Contest again, so, as in the previous two years, the Wildlife Sound Recording Society will co-operate in the running of it. Final details are not worked out but I think you can take it that there will again be a really good prize for the overall winner; the entry classes are to remain the same and efforts are to be made to try to improve the number of entries in the Junior Class. If you have teenagers (under 18) interested in natural history here is a chance for them to compete against their own age group in the art of recording. If you want entry forms write to *TAPE Recording Magazine* office and they will be sent as soon as they are ready.

Class 3 - Atmosphere, seems to have presented some difficulty in interpretation. It was introduced last year in place of the previous "rarity" class. A lot of the entries this year were not atmosphere recordings at all, many of them were duets, and there was one of a bird making a nest. An entry in this class must tell the story of a period (up to three minutes in a specific habitat, and so it might be easier if you looked upon it as being an habitat recording. I think it is one of the most difficult recordings to make successfully. As many as possible of the species likely to be found in the locality should be included, but no one species should be predominant for more than a few seconds. Now such a recording, taken at any given location, is obviously going to differ according to a number of factors, such as time of day and season, to say nothing of weather conditions. It is, therefore, doubly important that the fullest possible

documentation should be given with the entry.

Weather is a vital factor. To include any special weather conditions makes it even more difficult to achieve a good balance. Alan Ferry managed it perfectly in his winning tape tape which included falling rain and distant rolling thunder as a backdrop to a dawn chorus. So, unless you specifically want to depict the weather, choose a very calm day.

Water is a feature of many habitats, either running in streams or lapping on lakeside. Again a good balance is all important, coupled with a microphone position which will make the water sound convincing - not at all easy with mountain streams - and trial runs are well worth while.

Determination of the correct recording level is another matter which is best done by trial and error because so many habitat recordings are made at such low gain or with such low level sounds, that the record level indicator will make few, if any, movements. It is a situation where A/B monitoring is of great help because it is the *recording* which you must monitor, not just what the microphone is hearing, to be sure. Experience is very valuable, of course, and after a few efforts you will find that you have a good idea of the record level required.

An omni-directional moving coil microphone is most suitable and it is probably best placed to point skyward so as to receive sound equally from a complete sphere. I always carry a couple of chemical retort clamps with me; these can be used to fix the microphone in all sorts of positions. Two clamps fitted together will fix it to a tree or one, with its stem in the ground, will hold it at ground level.

There is no reason why a parabolic reflector should not be used for habitat recordings, I have heard some excellent ones made in this way - Ray Goodwin's runner-up is an example. Indeed there are situations where it is a distinct advantage to use this method. Consider, for instance, marshes and lakes where you can approach only as far as the edge of the habitat. The reflector, however, restricts the recording to only a portion of a sphere and must, therefore, be used with care when it will be perfectly satisfactory. One thing you must not do is to re-direct the reflector during the recording - if you do then the background will alter.

I find it a great advantage to keep the tape running for very long periods. I often run off the whole side of a five-inch spool on such a recording and then, when I get back home, go through it to select the sections to keep.

By now, Alison Richard (she has a good surname!), a young lady from London, should be in Madagascar where she is to study the Lemur for her degree. The voice and language of this creature is one of the items to be included in her eighteen months' expedition and she came to see me for advice on recording equipment. Her very sound choice was the Tandberg Series II and I am looking forward to hearing how it stands up to tropical conditions.

Music

Musicassette Reviews

Consultant Critic Katinka Seiner

TSCHAIKOWSKY. *Serenade for Strings in C Major, Opus 48, and "Nutcracker" Ballet Suite, Opus 71a.* The Berlin Philharmonic Orchestra conducted by Herbert von Karajan. DGG 923 046. 49s 6d including purchase tax.

Here we have two of Tchaikovsky's most popular works performed for us by the Berlin Philharmonic under the great Karajan. A glance at the copious sleeve notes draws the listener's attention to the fact that contrary to often expressed views the composer treated the *Serenade for strings* as a thoroughly serious work. When writing to Nadeshda von Meck he refers to his "inner compulsion"; he adds that the work is warmed by feeling and expresses the hope that it possesses artistic value.

In this performance both the conductor and his orchestra devote an equal sincerity to their interpretation. This is an album that demands listening. Like a magnificent piece of sculpture, such as *The hand of God* by Rodin where the figures literally "grow" out of solid stone, so do the phrases rise up in their sweeping convolutions to charm both the ear and the intellect. As the polished stone reveals the plasticity of the flesh it portrays so the strings offer an equally yielding sweetness. This is music.

In his lifetime Tchaikovsky was not regarded as a "popular" composer. Today schoolchildren are taken in parties to listen to his works. Never could the composer have imagined such an event, even in his wildest dreams. Most of us cut our classical teeth on his compositions yet even the most sophisticated cannot help but feel a sympathy towards the lyricism of his melodies. When treated with the respect they deserve, as in this Karajan album, then the true beauty of the music is transparently revealed. I suggest that any who complain that they have "outgrown" Tchaikovsky should listen carefully to this tape. It will be a rewarding experience.

As to recorded quality, this is well up to the DGG standard with a good stereo separation; if anything perhaps just a little too much emphasis on left and right if one is to be really critical. But, as a final assessment, I can only recommend this Musicassette as offering really excellent listening with a performance that is outstanding.

SCHUBERT. *Symphony No. 1 in D Major, D 82, Symphony No. 3 in D Major, D200 and Overture in the Italian Style No. 1 in D Major, D590.* Dresden State Orchestra conducted by Wolfgang Sawallisch. Philips CPC 0052. 49s 11d including purchase tax.

First impressions of this cassette were something of a disappointment. Sound quality lacks that searing clarity that can mark the best recorded repertoire in this medium. Instead we

have a "boxiness" that I find quite disturbing. It is a dated sound, reminiscent of 78 rpm records, with a touch of distortion on the louder passages.

One effect of less-than-good audio quality is to produce a feeling of boredom in the listener – in this listener at least. One asks oneself: is it caused by the repertoire, the performance or the recording? I suspect that the latter is probably the right answer.

A friend hearing this album remarked that he felt he wanted to "tune the station in", and that is just the feeling one gets. Which is a pity, because the music of Schubert deserves something very much better.

Both the symphonies were composed in Schubert's early years, and are in fact examples of adolescent work. When he wrote the *First*, in 1813, he was no more than about sixteen years of age, yet the work contains obvious signs of the mature genius to come. The *Third*, written two years later, is full of original melodies and interesting harmonies. It is a work that many an older composer would be proud to lay claim to.

Why, one wonders, did the publisher decide to sandwich the *Overture* between the two symphonies? Surely the logical place for it would have been at the beginning of the album? As it is it follows the *Third Symphony* to fill up the vacant space at the end of track one.

In this *Overture*, called "*In the Italian Style*", Schubert displays his ambivalent admiration for the great Italian master, Rossini. It has been said that Schubert tossed off an overture in imitation of Rossini's style in a spare hour before dinner one day. Be that as it may, there can be little doubt that through his good-humoured leg-pulling of the older man there must have been a genuine appreciation.

I wish I could recommend this Musicassette without qualification, but in view of the recorded quality this is not possible.

DANCE DANCE DANCE. The World Ballroom Orchestra. Liberty C0842 47s 6d including purchase tax.

There is an exotic fascination in faraway places, with or without strange-sounding names. The colourful brochures of the travel agents with deep blue seas, high mountains and brilliantly yellow sands need only the services of a magic carpet to turn them into reality. Here, in this collection, we have such a vehicle. No trouble at take-off; no problems at landing; just the fun of imagining oneself there.

But the purpose of the album is to provide strict tempo music for dancing, and this function it fulfills perfectly. The "World Ballroom Orchestra" is in fact a group of some of our best dance band musicians and during the recording session Alex Moore, one of the most famous names in British ballroom dancing, was listening to check that the tempi were absolutely right.

There are a number of old favourites on the tape, such as: *Edelweiss, Moonlight serenade, Quando, quando, quando* and *Wedding samba*. We also have *Can't buy me love* (Lennon-McCartney) but I found this item to be uninspiring and tedious, not so much through its performance as through the weakness of the material. Other items include: *Lorraine, Jeannie with light brown hair, Woodchopper's ball, Little Peppito, Chiquita cha cha, A walk in the Black Forest, El bandolero, The Rio tango* and *Tango '65*.

The repertoire has a leaning towards Latin-American rhythms, but most dancing enthusiasts will not complain about that. Recorded quality is generally good, although at times there is a slightly "clouded" effect which leaves the album as falling something short of the very best. However, for the purpose for which it has been published, for dancing, it is excellent and can be strongly recommended. And incidentally it makes some rather pleasant listening as well.

NON STOP DANCING '68. James Last and his orchestra. Polydor 911 120. 47s 6d including purchase tax.

Giving a party? Want some dance music? The title of this album seems to indicate that it's just the very thing for you. But is it?

With no fewer than twenty-eight numbers (fourteen-a-side) it lacks that one essential – dance rhythms. Certainly it has nothing whatever to do with ball-room dancing. Maybe a little shuffling hip-shaking is possible? I tried it. No, I didn't actually end up in hospital, but then I've always had supple joints.

As this tape is a recording of what appears to be a public performance in a dance hall there's plenty of audience atmosphere. If you want to give the impression that your party is being held in the middle of the local *Palais de Dance* then it would serve your purpose very well indeed. If you seriously want to dance then look elsewhere – or make suitable arrangements with the ambulance service first.

Recorded quality is not at all bad. One cannot really complain about the mush of audience noise throughout, including some rather raucous voices shouting choruses. It's all part of the "atmosphere". And amongst the numbers we have some very familiar ones: *Judy in disguise, Nobody but me, Oh baby shake, Boogaloo down Broadway, Bend me shape me, A Banda, Massachusetts, Hello goodbye, Darlin', Neon rainbow, Zabadak, Delilah, Poochy* and *Der Graf von Luxemburg*. And that's only one side . . .!

As for *Der Graf von Luxemburg* (capital "G" please note Polydor!) He either wisely failed to turn up to the party or perhaps he was there all the time in disguise. At all events the dear Count was certainly unrecognisable. Perhaps it was a different Count from a different country?

Music

Open Spool Reviews

Consultant Critic Katinka Seiner

3 $\frac{3}{4}$ 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

PROVOCATIVE SOUNDS OF BRASS, STRINGS AND PERCUSSION. Larry Moreton and the New London Brass Ensemble. Coronet CSL 7428 7 $\frac{1}{2}$ ips four-track stereo. 61s 6d including purchase tax.

In this album we have some highly original treatments of a bunch of firm favourites. The sleeve notes refer to "multi-channel" presentation with marked right-hand and left-hand separation. This is certainly the trend in certain classes of modern records and it does enable the enthusiast to show off the brilliance of his stereo equipment. "Hark at that — trumpets on the right, horns on the left! Lovely!"

That's fine with me, so long as the purchaser is aware of the fact that what he is buying is harmless, or even interesting, fun, amusement and pleasure rather than music. Whilst certain recording studios go to extreme lengths using much costly equipment to achieve this dramatic channel separation, others are going to equal trouble to get rid of what is really a musically false sound. The whole point of good stereo is that it should not be ultra-directional but should give an impression of reality through solidity. Which, as we have said before, is what the word "stereo" really means.

But tapes like this are of great interest because they represent an attempt to bring a new sound and a new dimension into the home of the listener. Arguments on musical values are quite pointless. There is no pretence to "re-create" anything — instead we are frankly offered something new and different. As such assessments of the value of the project can only relate to the enjoyment it might bring. There is much in so-called modern or contemporary music with which I am personally out of sympathy, but if we admit that music is an arrangement of sounds, regardless of the instruments or the way they are used, then Larry Moreton is just as entitled to experiment within his particular style, using his own techniques, as say Carl Heinz Stockhausen.

The repertoire for this particular excursion into the world of drama through the microphone is made up of: *Sabre dance, Cuanta la gusta, Among my souvenirs, Fascination, Anna, Besame mucho, Poinciana, Parade of the wooden soldiers, Toy trumpet, El Cumbanchero, You made me love you, Tabu, Orchids in the moonlight, Carrioca, In a little Spanish town, Bahia and Holiday for strings*

Quite a selection. Quoting again from the sleeve notes it is said that: "You can sit back

and imagine the layout of the band spread before you, the stands up front and those at the back; at times the band could almost be playing on a revolving stage". I would not argue with that, and since it is the endeavour it must be agreed that it succeeds. Recorded quality has the brilliance that one might expect and it may well be found necessary to reduce the slight harshness by applying a little top cut — not much, but just a bit.

When a recording of this kind is endowed with really superlative technical quality it can present an unusual and enjoyable experience. My judgment of this record is that it falls a little short of the very best but still gives us plenty of very cheerful sound.

SOUND IN THE 4TH DIMENSION. Larry Moreton and his Visual Sounds Orchestra. Coronet CHL 7441 7 $\frac{1}{2}$ ips four-track stereo. 61s 6d including purchase tax.

Here we have another attempt to offer a completely new listening experience. It is said that each number was recorded under totally different conditions, in some instances with differing combinations of instruments. As many as 32 microphones were used on 8 separate tracks. The latest techniques use up to sixteen tracks, so in that sense it is not particularly new.

However the audio quality achieved on this recording is really excellent and it is quite immaterial how many tracks (or how many microphones for that matter) were used to achieve it. Again the declared intent is to produce something different, and as such it must not be evaluated as a conventional recording. There is no doubt that in the future commercial recordings will more and more frequently be tailored to suit listening conditions at home, conditions that are so different to those of the large auditorium. The resultant sound, described here as "a wider world of stereo", is not likely to please those who are used to listening to live performances, but, taken for what it is, it can provide quite a thrilling experience purely as an excursion into the realm of sound.

The sounds we are called upon to visualise here make up: *Limehouse blues, Ebb tide, Spanish eyes, Sound of music, Blue Hawaii, Get me to the church on time, Keep your sunny side up, In a little Spanish town, I want to be happy, Just one of those things and September song.*

An important aspect of projects such as this album is the need to arrange and orchestrate specially for recordings, so that the audio effects will have maximum impact. It is inevitable that the "music" should take second place. This collection will certainly please many, and that is all that counts. So for those who want to exercise their woofers and their tweeters, not to mention the squawkers in the middle, this album can be recommended. Again a suggestion of top cut is recommended to dull the sharper edges, but apart from that quality is fine.

3 $\frac{3}{4}$ ips MONO

MOZART HORN CONCERTOS. Dennis Brain, soloist, and the Philharmonic Orchestra conducted by Herbert von Karajan. EMI Columbia TA-33CX 1140 3 $\frac{3}{4}$ ips half-track mono. 47s. 4d. including purchase tax.

In this album of Horn concerti by Mozart we have *No. 1 in D Major*, K 412 and *No. 3 in E Flat Major*, K 447 on side 1 and *No. 2 in E Flat Major*, K 417 and *No. 4 in E Flat Major*, K 495 on side 2. The soloist in each concerto is that great virtuoso, Dennis Brain.

Brain's tragic death in a motor-car accident (was it ten or twelve years ago?) shook the musical world. Only a day or two previously I had been listening to his performance at a Promenade Concert in the Albert Hall. Still a young man at the time of his death he had acquired an outstanding reputation for his accomplishment on his favourite instrument, the horn.

This virtuosity is clearly displayed in the performance of these horn concerti. With precise musical phrasing he conjures up such tonal variety and expression that one realises why he was acknowledged as one of the greatest exponents of this extremely difficult instrument. So difficult is the horn that Mozart, showing a delightfully human sense of humour, inscribed the score of the rondo of the *No. 1 Horn Concerto* with mock instructions for the soloist. These were quite unplayable and were obviously intended as a huge joke.

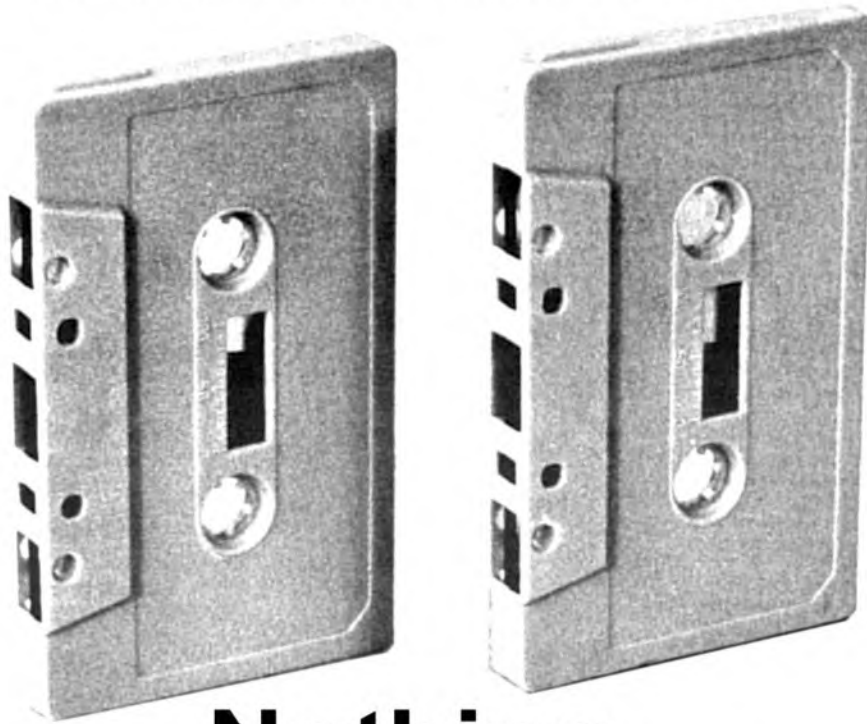
Written at fantastic speed these compositions show the composer in one of his light-hearted moods, quite lacking that melancholic undertone to which I have previously referred.

The four concerti were composed during the period 1782 to 1786, the fourth, last, in the same year as *The Marriage of Figaro*, in Vienna. During this period he was teaching and had subscription concerts to raise money. Unhappily he died in poverty in spite of the fact that, had he lived, he could have taken advantage of a number of offers that would have been to his financial benefit, thus alleviating his dire stress.

Recorded quality in this album is excellent. It is difficult to separate recordings from programme content when one feels as personally involved as I do with this repertoire. It can only be said that listening to this album is a moving experience that can be recommended to all.

There will never be another Dennis Brain although since his untimely death Alan Civil has been acknowledged to be his worthy successor as our leading virtuoso performer on the horn. Perhaps one day we shall have the pleasure of reviewing these same works played by him.

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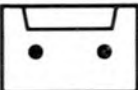
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FOLLOWING the success of the Telefunken M501 tape recorder introduced in 1969, AEG (Great Britain) Ltd. are now offering a de luxe version at a recommended retail price of £44.2s.0d.



This four-track, single speed, mono machine (3 3/4 ips) will accept spools up to 5 1/2-inches in diameter. Chief change lies in the styling which in this model comprises wood grain effect side panels. The distinctive tape length counter runs along the whole of the front of the machine which is provided with the usual record level indicator, tone control, instant-stop button and a transparent mini-cover which can be left on the machine whilst it is running.

AEG (Great Britain) Ltd., Lonsdale Chambers, 27, Chancery Lane, London, W.C.2.

NEW RANGE FROM BRC

FIRST of the new Ferguson and HMV models for 1970 announced by British Radio Corporation (Thorn Group), are two additions to the range of Ferguson tape recorders, and an HMV portable stereo record player.

The Ferguson tape recorder Model 3245 is a twin-track, single speed machine running at 3 3/4 ips. Incorporating the latest BRC-engineered tape deck, the machine is equipped with spools up to 5 1/2-inches diameter. Spools of 7-inches diameter may be accommodated with the lid removed.

The new BRC deck has all-transistor circuitry and includes an automatic recording level control which may be switched for speech or music. Amongst the other facilities are a 4-digit



counter with push-button reset, latching pause key and ancillary sockets. The sockets provide for mic., radio and pick-up inputs, a low level output, an external loudspeaker, and monitoring recording or playback with high impedance earphones.

Compact, the dark grey moulded cabinet has a removable transparent lid. Supplied complete with moving coil microphone, a 900 ft LP tape on 5 1/4-inch spool, and record play-back connecting lead, the Ferguson Model 3245 tape recorder has a recommended retail price of £35.19s.

Ferguson tape recorder Model 3246 is a 4-track, single speed machine running at 3 3/4 ips. Of very similar specification to the Model 3245, this machine also has automatic recording level control but includes a three position switch enabling auto-music, auto-speech or manual control during recording.

Finished in a dark grey moulded cabinet with removable transparent lid, Model 3246 has overall dimensions of height 5 5/8-inches, width 14 1/4-inches and depth 10-inches, the same as 3245.

Supplied complete with moving coil microphone, a 900 ft LP tape on 5 1/4-inch spool, and record play-back connecting lead, Ferguson Model 3246 tape recorder has a recommended retail price of £41.14s.



The HMV Model 2025 is a portable record player providing quality reproduction of stereo records. Using an all-transistor amplifier the player has a claimed output of 3 Watts/channel (speech and music rating) at 5% harmonic distortion. The two 7 x 4-inch loudspeakers are both detachable from the amplifier/turntable unit. When clipped to this base unit they form a cover. There are separate rotary balance, volume, bass and combined treble/on-off controls, and a neon mains indicator. Turntable used is a 4-speed BSR autochanger with a turnover sapphire styli on the pick-up. A DIN stereo input/output socket is fitted for use with a radio or tape recorder.

The record player is presented in a teak veneer with 'coal black' Vynair on the speaker faces. Overall dimensions are height 8 3/4-inches, width 16-inches and depth 17 inches. Speaker units are 5 x 8 3/4 x 16-inches. Recommended retail price of HMV model 2025 is £39.17s.

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YET ANOTHER low cost accessory from Multicore Solders is the Bib size T/2 pack of 20 Tape Box Labels. Printed in a form which makes them easy to complete, to identify titles, artists, reel number, date and type of tape, they are suitable for application to the edge of either 5-inch or 7-inch containers.

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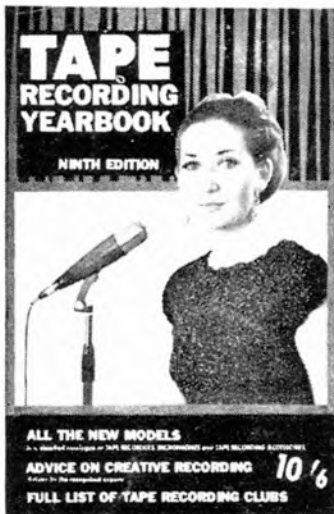
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REMITTANCE MUST ACCOMPANY ORDER

Cheques and Postal Orders to be made payable to **Print and Press Services Ltd.**



Model MR-115 -the powerful portable

Operates on six flashlight batteries, or regular AC household current. 1,200 mW output power. Automatic level control (ALC) constantly keeps recording level adjusted for optimum recording quality, no manual adjustments required, especially useful for speech recordings. Three digit tape counter. Spindles accommodate 5 inch reels. Mixing while recording. Two signal sources (i.e. mike + radio, mike + record player) can be used simultaneously. Convenient for blending background music into narration. Continuous tone control. Battery condition indicator. Extension speaker and earphone outlet. Practically designed plastic cabinet designed for easy carrying.

SPECIFICATIONS

Recording system :
AC bias, 2 track
Erasing system :
DC erase

Tape speed & Recording time :
(With 5" reel, 2 tracks, 50μ tape)
3 3/4 ips (9.5 cm/sec) 64 min.
1 7/8 ips (4.8 cm/sec) 128 min
Frequency response :
(Record & Playback)
150-6000 cps at 3 3/4 ips
150-4000 cps at 1 7/8 ips
Output power :
Maximum 1.2W
Power requirement :
AC: 115/230V, 50-60 c/s
DC: Size D (UM-1) x 6
Output impedance :
EXT. SP: 8 ohm
Loudspeaker :
6 1/4" x 3 1/8" permanent dynamic speaker
Voice coil impedance 8 ohm
Power consumption :
15VA
Dimensions :
11 3/8" width x 10 5/8" depth x 3 7/8" height

(295 mm x 270 mm x 98 mm)

Weight :
9.4 lbs (4.3 kg) approx.

Accessories :
Microphone, 5" full tape
Empty reel, Splicing tape
Power cord

The MR-115 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 :

Sanyo Marubeni (U.K.) Ltd.,
Bushey Mill Lane, Watford, Herts.
Telephone: Watford 25355.



People the world over agree there's something about a Sanyo