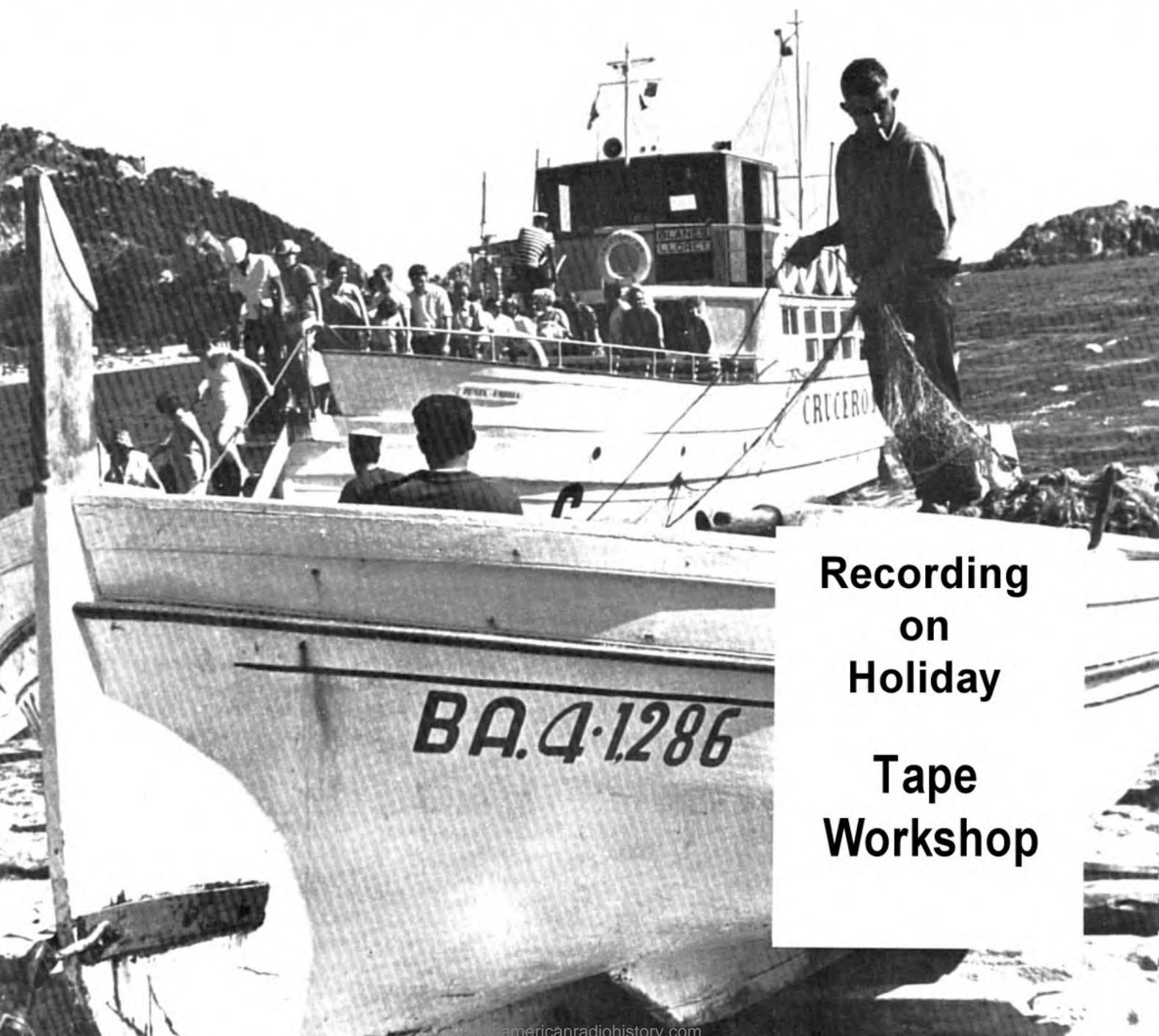


APRIL 1970

2'6

TAPE

RECORDING MAGAZINE



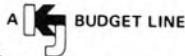
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Tape
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900' on 5" reel	12/6	36/6	71/-	138/-
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We are pleased to announce the opening of our new showroom at 101 St Albans Road, Watford, as from 1st April 1970.

These spacious and luxurious premises will replace the smaller shop at 17 The Bridge, Wealdstone, and will offer full comparator demonstration facilities, plus a wide range of equipment on display.

Our sales staff will be pleased to meet and discuss the type of equipment or tapes most suitable for your use at Hertfordshire's leading Hi-Fi Centre.

*Although every effort will be made to ensure that the new showroom is open on time, if you intend travelling any distance to see us, it would be best to check by telephone before starting out.



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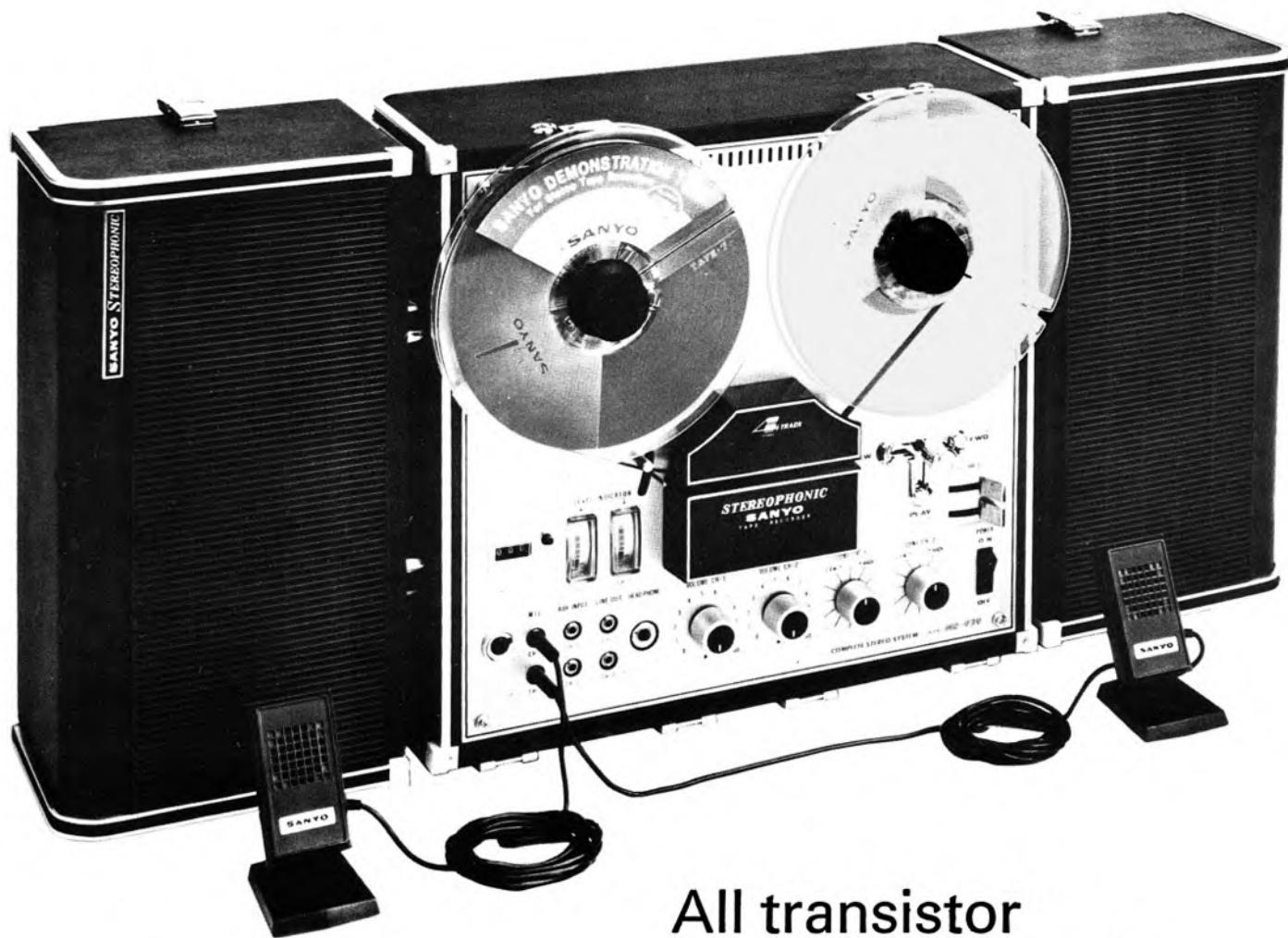
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60, 90 & 120 minutes playing time. Brand New with plastic library box, and index card. Latest type using low background noise, high output tape. Fully guaranteed

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C.60	17/6	11/3	32/6	62/-
C.90	25/-	14/9	42/9	82/-
C.120	32/6	19/6	57/-	110/-

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Model MR-929

4-track Monoaural Recording and Playback, choice of $7\frac{1}{2}$ in/sec. and $3\frac{3}{4}$ in/sec. speeds. Sound-with-sound System. 2-channel 4 track full-frequency recording and playback with true-to-life stereo sound effect. All-transistor OTL Circuitry. Professional Type VU Meter for each of the 2 channels, indicates best sound input. Built-in tape counter facilitates spotting of recorded contents by eliminating guess work. Vertical or horizontal operation.

SPECIFICATIONS

Recording System: AC bias

Erasing System: AC erase

Reel Size: 7" dia.

Speeds:

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

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

Playing Time:

stereo

30 min. x 2 at $7\frac{1}{2}$ in/sec

with 7" (18 cm).

1,200 ft. (360m) tape

1 hour x 2 at $3\frac{3}{4}$ in/sec
with 7" (18 cm),
1,200 ft. (360 m) tape
monoaural
30 min. x 4 at $7\frac{1}{2}$ in/sec
with 7" (18 cm),
1,200 ft. (360 m) tape
1 hour x 4 at $3\frac{3}{4}$ in/sec
with 7" (18 cm),
1,200 ft. (360 m) tape
Rewind Time: 3 min. with 7" (18 cm)

Frequency Response:

20-19,000 c/s at $7\frac{1}{2}$ in/sec

(19 cm/sec)

(30-15,000 c/s \pm 3db)

30-12,000 c/s at $3\frac{3}{4}$ in/sec

(9.5 cm/sec.)

Recording Level Indicator:

VU meter

Power Output:

Maximum 4W (each channel)

Music 6.5 W (each channel)

Speakers:

Two 4" free-edge permanent
speaker boxes.

All transistor
stereo/monoaural
tape recorder.

Voice coil impedance 10K ohms.

Line Outputs:

IK ohms

Power Source:

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

Dimensions:

$14\frac{1}{2}$ " wide x $12\frac{3}{4}$ " deep x 11" high
(350mm x 330mm x 280mm)

Weight:

28.6 lbs. (13 kg)

The MR-929 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.,
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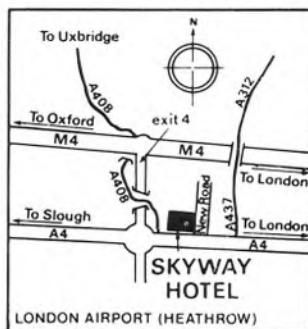
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12 inch base speaker and tweeter. 8 ohms. 16 watts		
Sansui SP 100 Loudspeaker	£57	£42
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All transistor AM/FM 16 watts. Built in speakers extra £6		
Hitachi Belsona Tape Recorder. Brand New	£44.2	£24.10
High quality 7½ and 3¾ ips. 2-track mono recorder, dyn. mic		
Telauken M301 portable tape recorder.	£70.17.6	£49.10.0
Brand new 4-track, 1 speed, mic. high quality		
Sony TC 135 Tape Recorder. Shop soiled	£26.5	£15.10
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1 inch Scotch, Memorex, Philips, 2 inch Ampex	Knockout Prices	
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High quality 7 speaker system. Attractive design		
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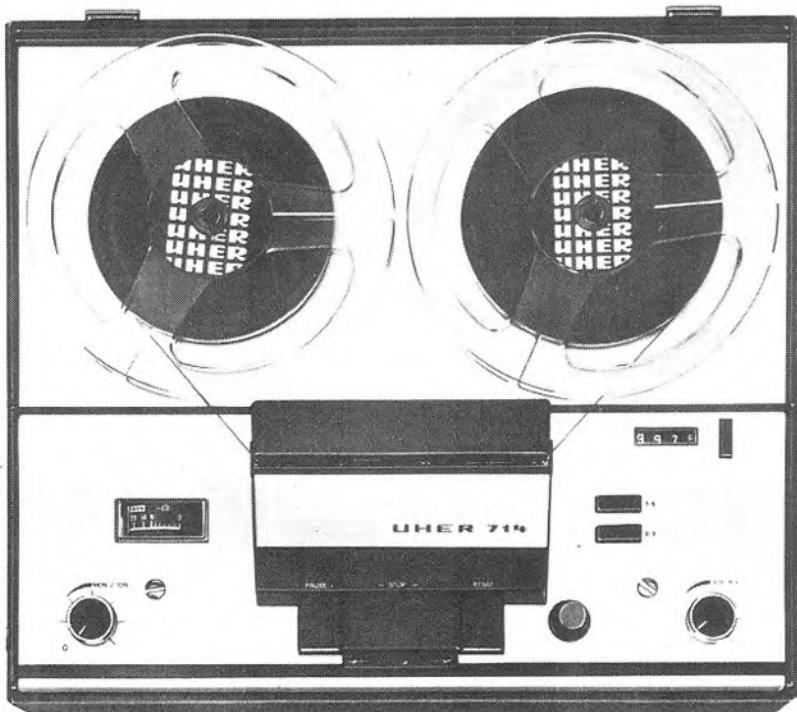
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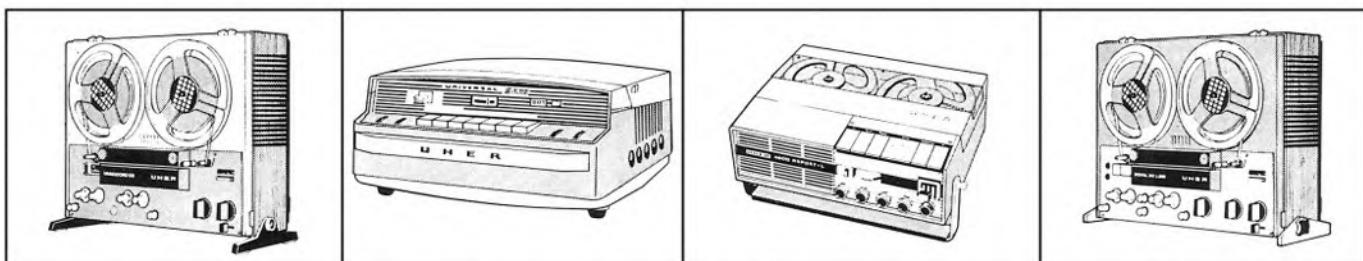
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Ferguson 3232	93 5 0	33 5 0	5 1 10
Sanyo MR929	97 4 9	33 4 9	5 6 10
Sony TC 252	99 15 0	33 5 0	5 10 10
Philips N4407	103 15 4	33 15 10	5 13 4
Akai 1710L	109 0 0	36 6 8	6 1 2
Sanyo MR939	112 0 2	38 13 6	6 2 3
Grundig TK247	112 10 0	37 10 0	6 5 0
Sony 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

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	Cash Price £ s. d.	deposit £ s. d.	12 Monthly Payments £ s. d.
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 0	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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Sanyo MR801	72 9 0	24 3 0	4 0 6
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
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- Sound-On-Sound with optional adapter
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- Supplied complete with 2 Microphones, 7" Tape, Audio leads, Makers 12 months guarantee and full instructions.

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Initial Deposit £32. 12. 2. 12 Monthly Payments of £3. 11. 8.

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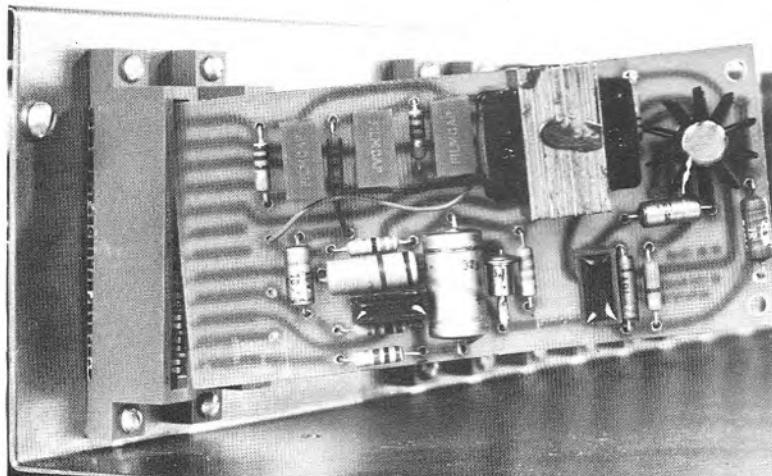
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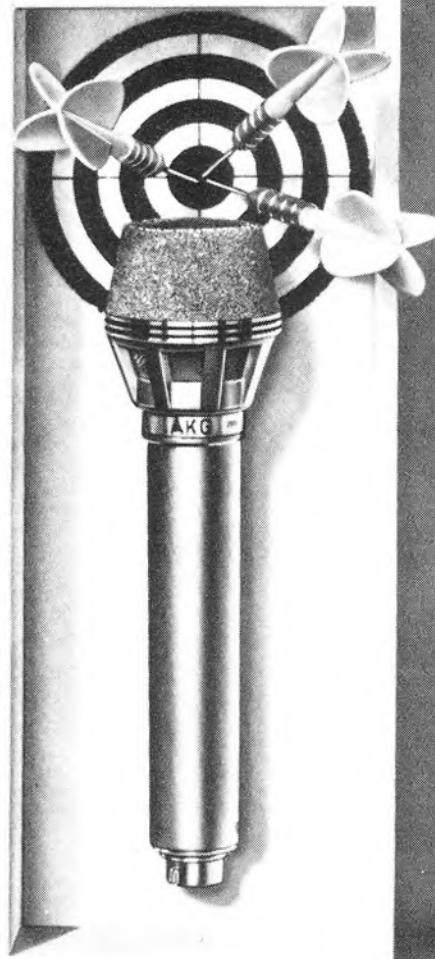
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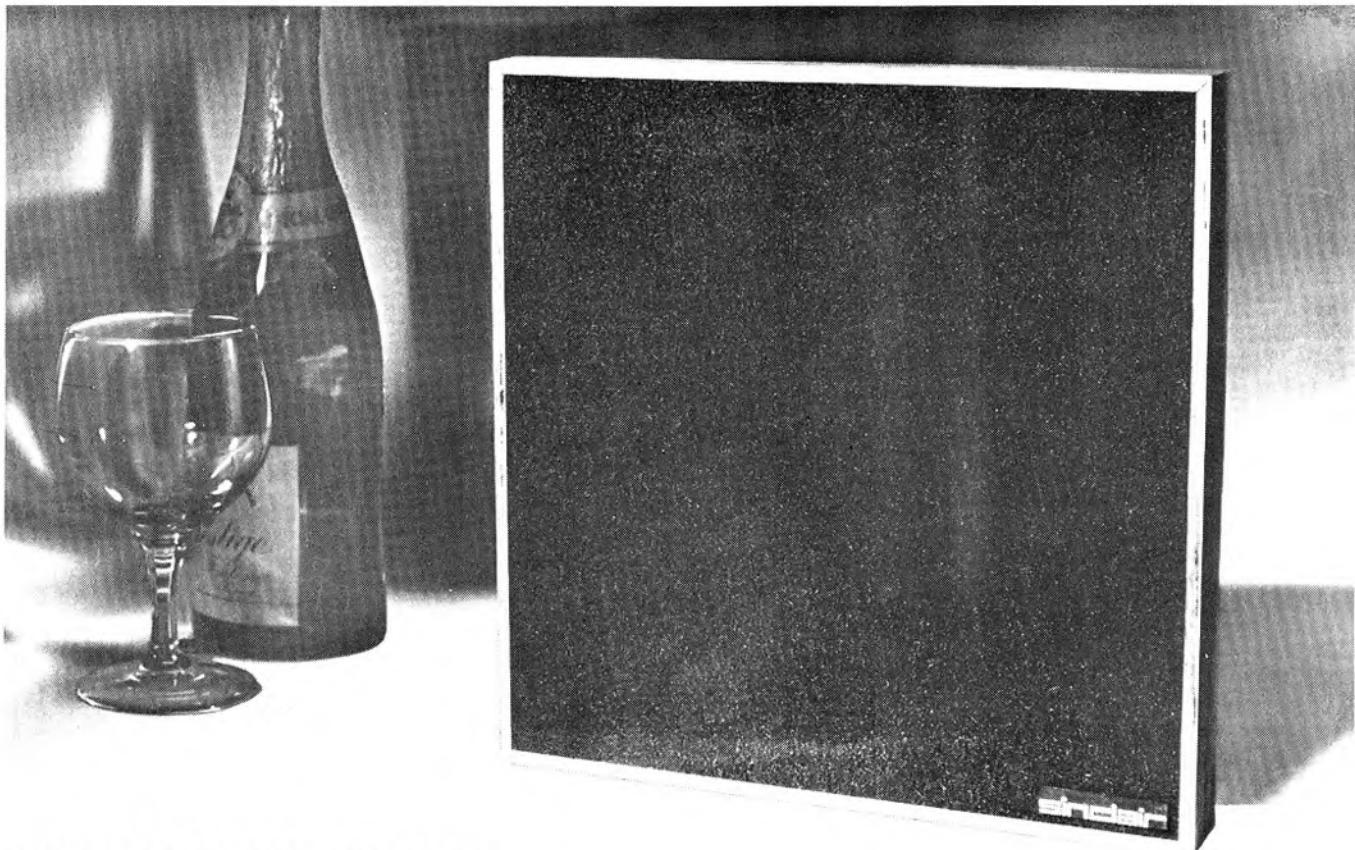
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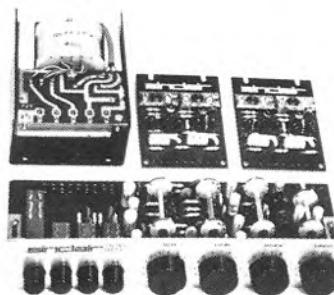
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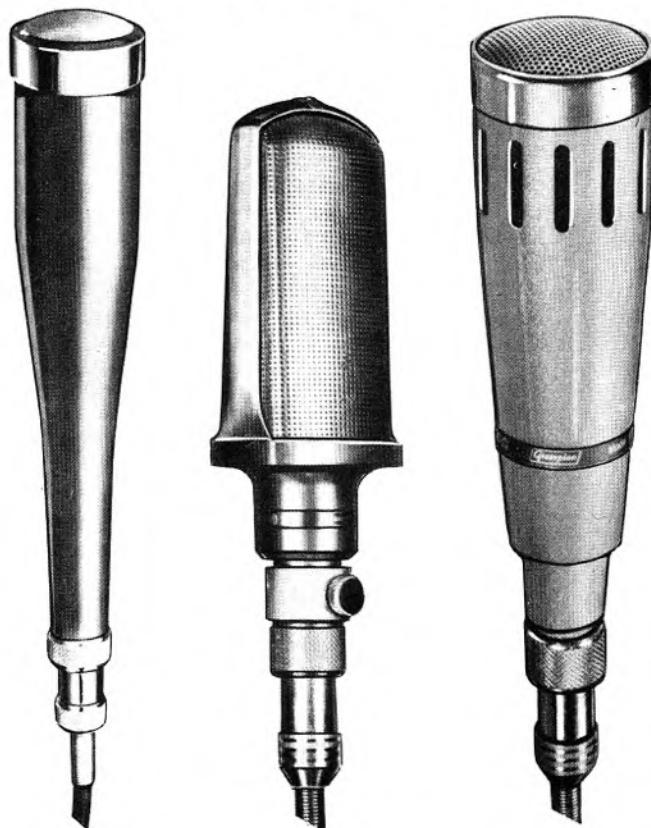
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Vol. 14

No. 4

April 1970

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Cover Photograph: The graceful lines of a fishing boat on the Costa Brava with a happy crowd of holidaymakers in the background as they disembark from a sea cruise. Holidays are times of sun, relaxation and, above all, sound. The recording enthusiast should be thinking now of his plans to record those many never-to-be-repeated tapes that will be full of holiday atmosphere. See Recording on Holiday, Page 121 of this issue.

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Tape trends and tape talk

By Douglas Brown

THE INTERNATIONAL Federation of Sound Hunters will celebrate its twentieth birthday in 1972 and it seems very probable that its annual Congress in that year will be staged in London. What is the significance of FICS after 18 years? How is it regarded by the tape recording industry, by radio concerns, by amateur enthusiasts in the various countries it serves? I think these questions are worth considering at this time, for it is not too soon to begin to create the right climate now if the 1972 FICS Congress in Britain is to be a success.

First, it needs to be said bluntly that the organisations of amateurs have never been highly regarded here as in most overseas countries. Many British manufacturers seem to have a scarcely-veiled contempt for enthusiasts in clubs; curiously, it seems to me, because there are not enough of them. Marketing men like to look where the crowds are massed.

In some European countries the amateur enthusiasts, no matter how small in numbers, are pandered to. They are seen as market stimulants. Thus, in Holland, Philips made available on free loan to clubs some of the first of their popularly-priced video recorders. Presumably, there were two reasons for this. There is no better way to test, in practice, the problems that arise when new equipment comes into the home. Secondly, the enthusiast who pioneers activity of this kind is going to talk about it widely and become an opinion leader, influencing other potential customers. All of us who have had long experience of tape recording know how frequently we are approached by friends and acquaintances seeking guidance on what equipment they should buy.

* * *

AT THE LAST FICS Congress, in Copenhagen last October, most of the leading manufacturers, acting through their Danish agencies, were actively involved. Directly represented at all sessions were the representatives of Philips, B.A.S.F. and of the German audio-visual industry as a whole. Because Cyril Rex-Hassan decided to visit it can be said that the British industry was also represented, through the British Audio Festival.

Perhaps more remarkable than the industry support was the interest of radio concerns. Leading radio stations in Belgium, Czechoslovakia, Denmark, France, Germany, Holland and Switzerland were directly represented. All of them collected material at the Congress and at the associated International Recording contest, for transmission in their programmes. Last year the Danish Radio were official hosts to FICS; this year Radio Lausanne is making the arrangements, next year the Belgian Radio will play host.

Can it be that the notably lesser enthusiasm to help

the organised amateur which is a feature of the British scene is well-founded on good commercial principles? I think not. The British firms have been too narrowly conservative in that they have looked for results on a scale, both in volume and in time, which they calibrated quite unrealistically. I hope that, in good time for the next visit of the International Federation to Britain, they will re-examine their attitudes.

* * *

THE FEDERATION is a genuine international. Currently, it has a German President, a Dutch secretary-general, and a directorate composed of representatives from Britain, Czechoslovakia, Denmark, France, Germany, Holland and Switzerland (let me declare my interest — I am the British representative).

Other nations are affiliated. In Italy, for example, the amateur movement is now making healthy growth. Norway, with about 400 enthusiasts organised in clubs, was admitted a member last year. An Indian organisation has been granted provisional membership for the current year. Entries in the International Contest regularly come in from all five continents, from Communist and non-Communist countries.

Reflecting the developing support accorded in other countries, FICS has now decided to invite each national affiliate to include in its delegation a representative of its national radio organisation and of the audio industry. I have little doubt that almost all other affiliates will be so represented at Lausanne in October.

I hope very much that Britain will not be odd-man-out.

* * *

THOUGH MOST SCHOOLS have long since acquired their tape recorders as standard equipment, there are a surprising number of teachers without a clear idea of how best to use them. The remaining pools of doubt and ignorance are now being busily blotted out.

The Inner London Education Authority is opening in September one of the most ambitious audio-visual centres to be found anywhere, offering advice and training to teachers. It will be equipped with sound recording studios, audio-visual aids workshops, programmed learning equipment, photographic, TV and film facilities.

Already, in the past couple of years nearly half of London's 20,000 teachers have been through courses designed to familiarise them with audio-visual teaching techniques.

I hope that, amid all this activity, the tape recorder will become familiar to school-children not simply as an instrument that is incidental to learning techniques, but as a medium for artistic expression and creative activity over a wide field.

RECORDING ON HOLIDAY

AWAY to the sun! Forget it all! That is the message of the travel agencies and it comes to us through the newspapers, the weekend supplements and with endless repetition from commercial television. The most desirable thing in the world, we are told, is to get away from the world we know to a world we don't know. An exciting prospect of new places, new people, and possibly even new countries. And on our return we shall bring a few "local" souvenirs and perhaps a snapshot or two. A lot of money will have been spent and there will be little to show for it, apart from our private memories and — we hope — the lingering remains of what was once a beautifully bronzed suntan.

Don't think that I am against holidays. To the contrary — I personally can't get enough of them. But it does seem such a pity to have so little to remind one, when it is all over, of the pleasures that were enjoyed so much. There is nothing more evocative of a holiday and the holiday atmosphere than hearing sound recordings that were taken at the time. After spending many holidays over many years in numerous different ways, sometimes taking no equipment at all, others just taking a camera and yet others again a camera and a tape recorder and still others just a tape recorder, I have no doubt at all that listening to recorded sounds enables one to conjure up those happy, carefree days more easily than in any other way.

The first time I took a machine abroad I was worried. Would there be trouble with the Customs authorities in the countries I was visiting? Would the U.K. Customs put me to endless trouble when I tried to bring it back home? It is, of course, only possible to speak from personal experience in these matters, but I have now taken a machine to numerous countries in Europe and have never had the slightest trouble in either direction. As a precaution I always carry with me either a receipt or some other proof of purchase in England, but the Customs



A typical street in a holiday town. All these people are willing to talk to the recording enthusiast.

men have never asked to see it. In fact they have never queried it at all. I always carry my machine slung on its shoulder-strap in full and open view and it has always been completely ignored. So if you are one of the countless people who take advantage of the excellent value package-deal foreign holidays — as I do — why not take your tape recorder with you?

Holidays in the U.K. present no problem whatsoever. We are not concerned with Customs formalities and there can only be two possible reasons for not taking a machine along: either you haven't got one, or, worse, you haven't the energy to carry it. The former can be excused and remedied at some future date, the latter offers no hope for redemption whatsoever!

That is not quite true because I have myself been away at different times and have been persuaded to leave the tape recorder at home. It has always been bitterly regretted; there are many moments in my life when I would have given anything to have a microphone in my hand and a machine on my shoulder. Alas! they are gone forever

and will not be repeated. At other times the machine has been with me — and yet not with me. How often does it happen that the recorder is left back at the hotel or base whilst the holiday-maker is out on an excursion? That will be the very time when all the exciting things will happen.

Somewhere on a Belgian motorway there's a little cafe. An unpretentious place, both outside and in. I've only been there once and shall probably never visit it again. On that occasion it was about one o'clock in the morning and the interior was dimly lit by flickering candlelight. The candles had been rammed into the necks of empty wine bottles and great cascades of white grease dripped down the sides on to the scrubbed boards of the tables where they stood. With a carafe of wine before me my eyes gradually accustomed themselves to the gloom. A party of young people were seated at the opposite end of the room. Their voices were quiet and they spoke in a language I did not understand. Suddenly, for no apparent reason, they began to sing.

Continued overleaf

It would be an exaggeration to say I had never heard such beautiful singing, but it would be equally true to say that I never heard such hauntingly wistful melodies sung by any group of people before.

I guessed that they came from Bulgaria, Rumania or some other Eastern European country. The songs sounded as if they reached far back into time, perhaps back into ancient folklore. As melody followed melody time rushed by whilst I just sat there mesmerised by the beauty of the scene and the sincerity of their singing.

Outside in the rainsoaked street stood a motorcoach. In the coach was a locked luggage compartment. In the luggage compartment was my portable tape recorder. Such a tragedy is not easily forgotten.

But there have been more successful occasions. There was the time in Spain when I visited the wonderful monastery at Montserrat. Perched on a mountain top in Catalonia it is a most impressive sight overhung by grotesque formations of rock. Out come the tourists' cameras to photograph yet again what must be one of the most photographed subjects in that country.

However I am much more pleased with the recording I was able to take in the monastery chapel. By chance I happened to be there when the boys' choir was singing. To hear them was a remarkable experience and to be able to record them was a privilege that added enormously to my enjoyment of the holiday.

Of course it is possible to buy records of the boys' choir in the monastery souvenir shop. (It's all very commercial!). But that's not the same — not in any way the same. My own recording is of the *performance I heard*. It is a living record of an individual experience for which there could be no substitute.

Spain is truly a land of sunshine and song and there were many recordings taken during that holiday. It seems that in that part of the world there is hardly a bar or cafe that doesn't have a guitarist at the very least. And they are all of them happy to perform with the microphone in front of them.

Then there have been holidays in Germany and Denmark, all of them with their treasured harvest of recorded sound. The boisterous, brash, singing that takes place in German beer house is quite different to what one would hear on, say, the Costa Brava. The music is different, the people are different, the voices are different and the songs are different. Never could the one be mistaken for the other.



Characters are to be found everywhere. This lady was working in the sun and she was only too pleased to stop and chat.

Don't run away with the idea that it's necessary to go abroad for a holiday in order to justify taking a tape recorder. I can remember talking to a venerable and ancient old gentleman in a tiny pub in a Derbyshire village. He must have been at least eighty years old and his face was deeply furrowed with lines and wrinkles. He had worked on the land all his life and his eyes were as clear and fresh as those of a young boy. After a brief introductory nod we soon found ourselves in conversation. He turned out to be a most interesting old gentleman and before long I was asking him questions about his childhood and his memories of the village at the end of the last century. With the help of a pint of the good local beer his memory improved and his tongue loosened. Soon story after story was being told and every one was recorded on tape. They told of a bygone age. He told of walking fifteen miles to see a motorcar. He told of strange happenings when out with the sheep across the moors. He told of hunger and poverty, of back-breaking work from before dawn to after dusk. This was the story of his childhood, the nights spent amongst animals and open country when labour was virtuous and often had to be its own reward.

Those days are gone. Perhaps that good old gentleman is now gone too, although I devoutly hope not. But his story lives.

Was that exceptional? There's nothing exceptional about the next tape in my holiday collection which is simply the sounds from the beach and the promenade at one of our better known south-coast resorts. Nothing to record? The whole place is absolutely teeming with sounds, from the sound of the train in which I travelled to the sound of the waves breaking on the shingled beach to the noises of the penny-in-the-slot machines in the fun

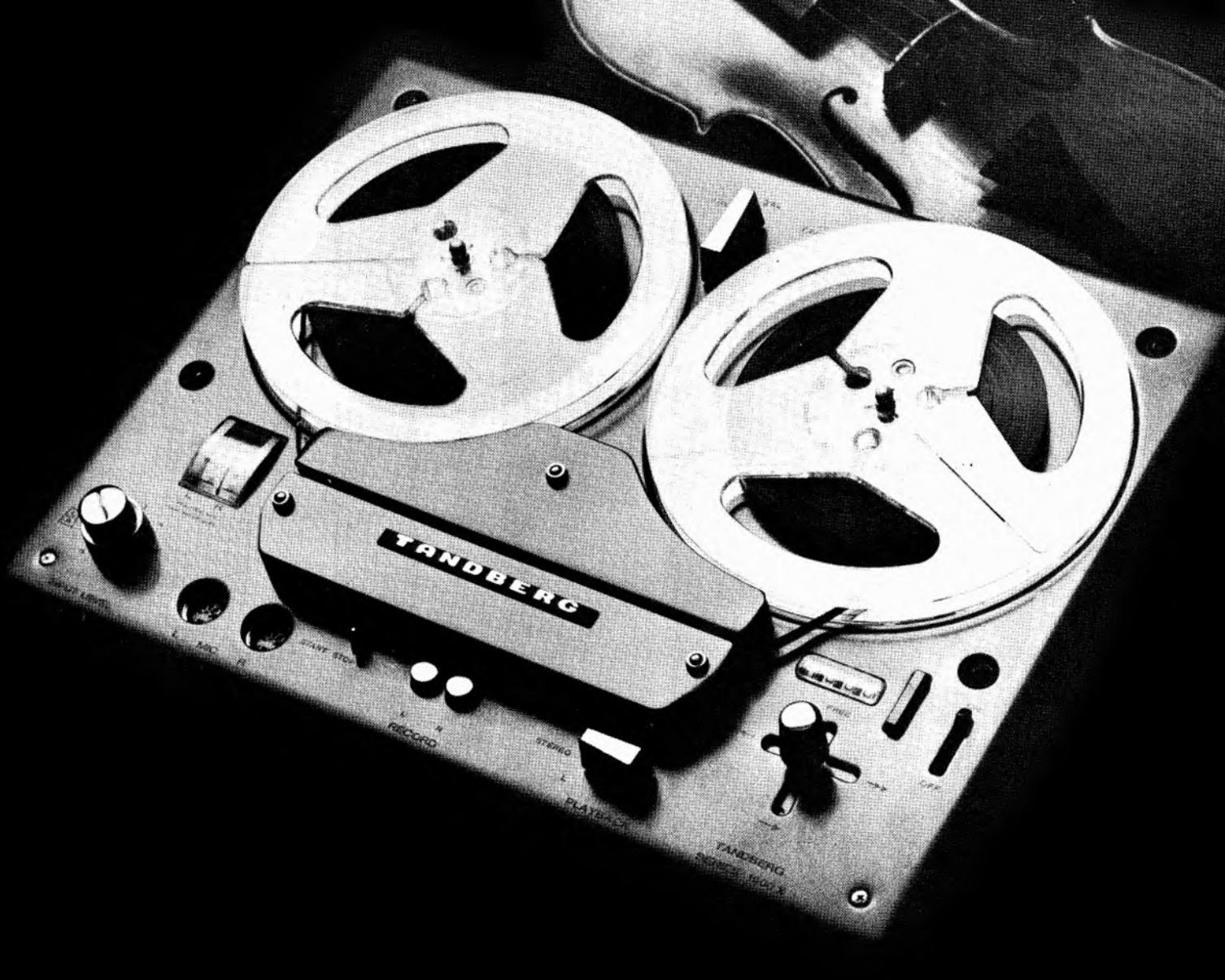
fair. There are dogs barking and children crying and laughing. Sound is everywhere, just waiting to be recorded.

Still not convinced? Look back towards some of your own holidays of ten or fifteen years ago. Just think how valuable sound recordings of those events would now be. Surely it is not too difficult to imagine that in the future recordings taken now will have an equal personal value for some? A value that will apply not only to you but also perhaps to your family.

What a shame it is that that dear old gentleman in his Derbyshire village did not have a Compact cassette machine on his shoulder in 1895. What a tape *that* would be today! Yet to him, at the time, it was just an ordinary year of ordinary life without anything very remarkable going on. That is our mistake. We tend to think that our lives are ordinary and that things around us will always be the same. In fact everything changes. If I were to return to that south coast resort today I would come back with a very different recording to the one taken some six or seven years ago. Instead of the sounds of the amusement arcade there would be the voices of the hippies and pseudo intellectuals as they argue over Vietnam and Nigeria. History wasn't made yesterday, it is being made today. And we are living in the middle of it.

That's really what sound recording on holiday is all about. It's bringing back little bits of history; bits of history that can be stored away and brought out at any time in the future to make the scene and the event live yet again in our imaginations.

I suggest that even in fifty, a hundred, or even five hundred years' time, there will be little change in the basic principles of sound recording. Whatever equipment we might then use it can only possibly change by being better, smaller, or cheaper. In its use it will still depend upon the initiative and imagination of the user. Now we have the technical ability to record we shall pass this knowledge on to our children and our children's children so long as civilisation exists. With the permanence of the magnetic medium there is not the slightest reason why our sound recordings should not be handed down to prosperity. Pardon me for mentioning him again but just imagine for one moment that my dear old friend in Derbyshire had had access to a recording machine but had not bothered to use it. It would have been a tragedy, but that is how future generations will regard us if we fail them now. Apart from which serious thought, permit me to assure you, that it also happens to be jolly good fun ...



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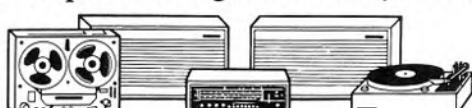
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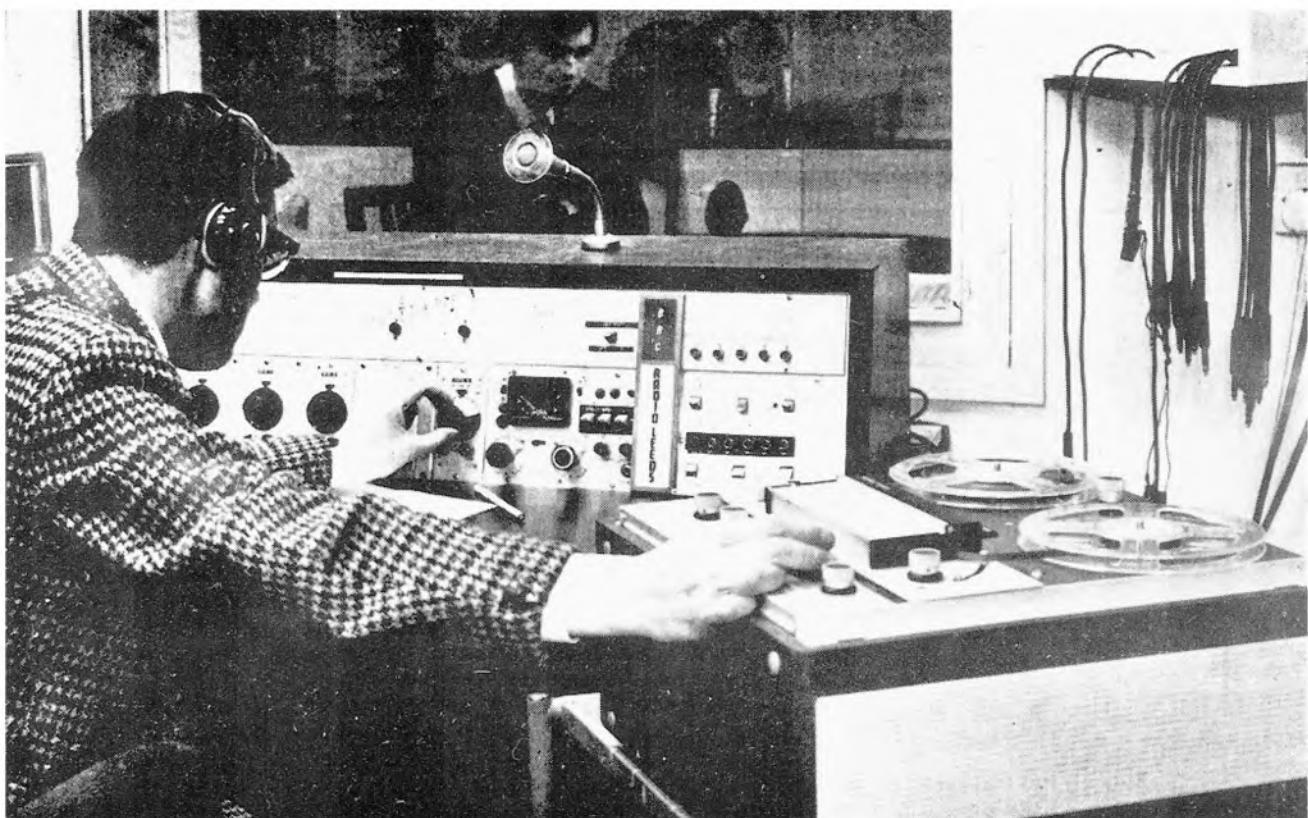
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THOSE OF us who are closely connected with sound recording and audio sometimes tend to forget just how little many people really know about the subject. This came home to me with a jolt the other day when discussing lectures for school-teachers on the use of audio aides in the classroom. Apparently at a recent course the lecturer had assumed that his audience would know the basic operating principles of the equipment and so had concentrated on more advanced techniques. Alas, his assumption was quite wrong, so little of what he was saying was understood.

Why should we assume that a teacher — or anyone else for that matter — is capable of using a tape recorder without any prior training or tuition? We, who are used to handling such machines, understand only too well that they are neither complex nor difficult to manage. But can you think back to your own reaction the very first time you set eyes on a recorder?

There is no divine power which endows a favoured few with secret knowledge, neither are we yet born with a built-in instinct to enable us to operate mechanical devices by unconscious, reflex action, although by the look of some instruction manuals certain manufacturers would seem to hopefully believe there is. It occurs to me that there should be great opportunities for those enthusiasts amongst us to offer a real service to the community by helping professional people, and teachers in particular, to acquire the simple skills that are necessary for the proper use of tape recorders.

Clubs are often asking for suggestions for group activity. Here is a suggestion. Almost every school in the country now possesses at least one tape recorder, but how many of the staff members are capable of using it? In most cases only a tiny minority.

Why not organise an "at home" evening and invite the local school staff to attend? It could be quite a pleasant social occasion and should specially appeal to those members who are themselves parents. The object of the evening would be a general talk and demonstration showing basic recording techniques. This could be followed by a discussion on the best ways of using the medium as a practical aide in the class-room.

Such a suggestion is sure to be welcomed by many, many teachers. There is no reason why from such a beginning there should not develop a close co-operation between school and club. It will be found that the teachers have many ideas for recording projects, all of which will be purposeful assignments of real help to their children's education. The resources of a club, both

CROSS

TALK

By Audios

in terms of equipment and expertise, are obviously greater than those of a school, yet it is the school that badly needs these services.

Surely it is no use complaining "we've nothing to record" if an effort is not made to contact organisations who could make use of the facilities we have to offer? Such work need not be restricted to clubs. There is scope too for the private individual, although he would, of course, suffer greater limitations of time and equipment.

Perhaps the trouble is that we all tend to be too insular, mixing with enthusiasts and talking to enthusiasts without looking hard enough at the world outside. It only requires a little imagination to apply the art and technique of sound recording to almost any field of human activity. I believe it is a mistake to concentrate solely on "pure" sound recording for its own sake, divorced from the reality of the rest of life around us. Already some clubs are doing work for hospital patients and this is an excellent example of applying techniques to a practical end.

* * *

RECENTLY I found myself sitting in on a thoroughly professional recording session. Two hours had been allocated for about fifteen minutes programme time. The job was completed with some thirty minutes to spare.

I was struck by the similarity of the problems facing the "pros" and those with which the amateur has to contend. Hum on one microphone channel to trace and eliminate; thuds mysteriously appearing from nowhere to be located and silenced; balances to be adjusted to prevent unpleasant peaking; more voice requested here — less voice there.

All the familiar old problems. But what is different in the professional world is the speed with which corrections are made. Alterations to performance or to the technical set-up are made the moment their need becomes apparent. There's no time wasted fumbling or arguing. All those concerned work efficiently and harmoniously together, conscious of the fact that the important thing is the job to be done.

Listening to the final playback of the tapes I was also impressed by the fact that the average amateur, using the kind of equipment we are often talking about in these pages, could have achieved a standard of recorded quality at least as good as that reached by my professional friends. There's no magic about sound recording. All that is needed is good performance and good equipment to record it

on. Plus, of course, the quiet self-confidence that is acquired from long experience.

* * *

BIG NEWS on the music front. Ampex have confirmed that they have plans for the establishment of a major music tape duplication centre in this country during 1970. It was widely believed that this project suffered a set-back following the crippling imposition of purchase tax on pre-recorded tapes, so it is all the more encouraging to learn that it is now finally going ahead.

Since purchase tax so cruelly increased the retail prices of these tapes the market has been very depressed. Only one major manufacturer is still in the business, although there has been an upsurge of interest in Musicassettes. A big new duplicating plant should give an extra and much needed fillip to the music-on-tape industry — as well as increasing choice for the consumer. As soon as more news is available on this most important subject I will pass it on to you, but in the mean time one can only express admiration and gratitude for the initiative of Ampex. And whilst the name is still hot on the lips, when are we going to see the arrival of new Ampex domestic equipment in this country?

* * *

THE CONSUMERS' ASSOCIATION magazine "Which?" has been investigating "stereo" gramophone records. It suggests that if the purchaser wants "true stereo", rather than mono with a stereo face-lift, the label should be read very carefully. Only yesterday one of my close neighbours told me they had just been informed by an assistant in the local record shop that stereo discs can be played on any mono equipment without harm or damage to the record.

It is depressing to think that after more than ten years of stereophonic sound reproduction there should still be so much misunderstanding about it. In ordinary members of the public this is excusable; in the trade it is not.

The facts are really very simple. Genuine stereo is only possible when the original recording was made stereophonically in the first place. All the older recorded repertoire was mono, so the gramophone companies were faced with the possibility of holding a vast quantity of dead stock as soon as public demand shifted to stereo. Instead of writing it off many of them re-issued mono programmes under the label "electronic stereo" or something similar. Such records although in many cases sounding quite good, are not true stereo.

When the owner of mono gramophone equipment wants to play a stereo record (and virtually all the production will be stereo in the future) there are several choices before him. Most drastic is to "go stereo" by investing in new gear. This could cost anything up to several hundred pounds. Alternatively he could adapt his existing equipment so that it will give him mono playback from a stereo disc without harming the record.

Whatever anyone tells you in a shop it is a fact that playing a stereo disc with a mono cartridge will cause damage. If an assistant tries to convince you that it won't he just doesn't know what he is talking about. Either one must use a stereo cartridge with right-hand and left-hand channels shorted together to give a single out-put, or a "stereo compatible" cartridge must be fixed in the pick-up arm. It is not enough to just change the stylus. This will do nothing for you. The cartridge itself must be changed.

There are now available a selection of stereo compatible cartridges, most of them ceramic, and the cost will probably be between thirty to fifty shillings. So for an outlay approximating the cost of a single record it is possible to protect one's entire library. Makes sense, doesn't it?

TAPE WORKSHOP

THE FIRST two articles in this series both dealt with practical recording applications involving the use of microphones. So far however we have not attempted to establish in detail the properties of the microphones used. Results have been related only to recording conditions and the setting of the record gain control at the tape recorder. Invaluable lessons have been learned about microphone placing and level setting in this way. If the experiments detailed last month have been conscientiously carried out it is quite probable that information about the directional pattern of characteristic of the microphone used will also have been revealed at the same time. So this month we are going to look in closer detail at the different kinds of microphones and how they can be used in practical recording situations to give us the best possible quality on playback.

But first we must have a brief word on that vexatious subject, "quality". It has been suggested that quality is something which only interests the fanatic and it should not concern the ordinary individual who is only trying to get reasonable results from average equipment. In my opinion this is a completely wrong approach to the subject. It might well be true that mere quality for its own sake is a cold, abstract and somewhat meaningless thing. Much more important is *programme content*. However good the quality of the recording might be it is of little use or satisfaction if its content is worthless or meaningless. But this is a series of articles about the techniques of recording rather than the content of programmes. And when talking about techniques one must relate them to the best quality it is possible to obtain under any given set of circumstances.

Contrary to what many people might suppose the final audio quality in an original recording does not wholly depend upon the efficiency and performance (usually related to cost) of the equipment used. There are many, many ways of taking any single recording; our aim is to demonstrate the best way that will give the best results with any set of equipment regardless of its price or performance achievement.

When taking any live recordings there must be three main component or equipment groups involved. These are:

- 1) The microphone
- 2) The playback (monitoring) chain including loudspeaker.
- 3) The recording machine itself including the tape.

The apparently inverted order in which 1, 2 and 3 above have been listed is deliberate. It is the order of relative importance from the point of view of audio quality. Let's reason out why.

It does not take a lot of imagination to realise that, broadly speaking, the better the microphone (or the more suited it is to this particular application) the better will be the recording. Because the microphone is the instrument (transducer) that converts sound vibrations (energy) into electrical pulses (still energy but of a different kind) it is obviously capable of

influencing the sound quality and of imposing its own particular aberrations or colorations. But why consider the playback equipment next? The answer lies in last month's experiments.

Unless we are able to hear our recording adequately reproduced how can we assess whether it is good, bad or indifferent? Many a man has believed his recordings to be first-class simply because deficiencies were masked through the inadequacies of the playback chain.

Only lastly do we come to the recording machine itself because although this is a vital link performing an essential function it is the one item about which the ordinary user can do little or nothing in practical terms. The machine one has is the machine that will be used. The best quality it can give will be the best we can get. The only effective change that can be made is the drastic one of changing the machine itself and such a solution does not lie within the province of this series.

Right at the top of the list we have the microphone, and this is an instrument where change is not only possible but advisable. Within the membership of clubs or other groups there exists ownership of a wide variety of different kinds of microphones. During the course of our practical experiments it is hoped that these will be brought together to undertake the suggested comparative tests. The position is a little more difficult for the private individual working on his own and perhaps only possessing a single instrument. This limitation will naturally restrict the scope of the experiments that can be undertaken. However, it by no means invalidates the information given — to the contrary it becomes even more important to thoroughly understand the characteristics and peculiarities of the microphone when only one is available. The instructions given opposite are specially designed to reveal and underline just what these are regardless of the type of microphone being used.

We often turn to photography to explain parallels in sound recording. It's not such a bad idea to think of the microphone as serving a similar function for the tape recorder as the lens for the camera. Some cameras have interchangeable lens systems and the owner of such equipment has at his disposal a more versatile tool than the man who has only a simpler instrument with a fixed lens. This ability to "change the lens" is *not* common to all cameras but its equivalent in the tape recording world is universal to all machines. In this sense we have the advantage over our friends in photography; just as good camera lenses are expensive so are microphones of comparative efficiency and performance standard. Just as one can pay many hundreds of pounds for certain top-grade professional lenses so microphones in the same category might cost as much. But just as many good pictures are taken with the help of the least costly lenses so most people using recording equipment rely upon a modest range of medium to low-cost microphones that are capable of giving outstandingly good results.

A PRACTICAL SERIES OF EXPERIMENTS IN RECORDING FOR NEWCOMERS AND EXPERTS

By Denys Killick

EXPERIMENT 1. DIRECTIONAL CHARACTERISTICS OF MICROPHONES

Equipment required: One tape recorder with tape
One microphone (with stand if available)
Two Tables (one if the microphone can
be mounted on a floor stand)

We must now consider the directional or "pick-up" characteristics of the microphone or microphones we are using. Not all microphones will accept sound approaching from any direction; some discriminate against sound from certain angles and until these peculiarities have been established it is quite impossible to use the equipment to best advantage. It is very easy to discover these directional properties by following the detailed instructions below. Remember that what we are setting out to confirm does not relate in any way to either cost or performance standard. All microphones at all price levels have their directional patterns irrespective of whether they cost a few shillings or a hundred pounds.

Method

- A) Place the tape recorder on a suitable table, wire to the mains supply and lace up the spool of tape.
- B) Mount the microphone on its stand, preferably of the full-length floor type. If this should not be available use a second, small table. Allow for plenty of separation between microphone and machine.
- C) Switch the machine to the Record mode with the Gain control at an average level for voice recording.
- D) Position yourself in front of the microphone and say a few test sentences but also "mark your position." This merely involves actually saying, so it is recorded on the tape: "I am now speaking facing the front of the microphone."
- E) Next move to an angle of about 45 degrees to the face of the instrument being careful to maintain the same distance from it. Repeat the test sentences, again "marking your position."
- F) Continue the process of testing and marking moving gradually around the microphone until finally ending up back at the front face with a repeat of the first recording as at D above.
- G) Listen carefully to the playback, particularly noting any differences in levels that occurred as a result of moving your position.
- H) Repeat all these processes for any other microphones that might be available.

This is one of the most important investigations that any recordist can carry out. What do the results tell us? It is likely

that we shall find that our microphones fall into three quite separate categories. Either there will be no differences in level at all, in which case the instrument under test is said to be omni-directional; or there might be equal output from the front and rear faces with a dramatic decline at the sides, in which case we have a figure-of-eight microphone (almost certainly a "ribbon"); or lastly we might discover that the front face and sides are equally live but there is a discrimination against sounds approaching from the rear. This latter is described as cardioid.

Now these facts will be well known to old hands at the game. *But this is not enough.* If the tests have been carried out carefully we shall have learnt far more than can be conveyed by any of these standard terms, because we shall also have heard just what happens when a sound source is not correctly positioned directly in front of a sensitive microphone face.

EXPERIMENT 2. SOUND IS THREE-DIMENSIONAL

Equipment required: All as for Experiment No 1.

Valuable as the work might be in our first experiment this month, it does not quite tell us the whole story. We moved our speaking voice around the microphone in a single plane. We speak of sound as "filling a room" and indeed with reflections from walls, floor and ceiling that is precisely what does happen. There is a great deal of talk about these directional patterns of microphones, but they are rarely thought of as existing other than in the lateral plane — the one we have previously examined. But does a microphone also function "in the solid," that is to say from above and below as well as from side to side? The way to find out is by practical investigation.

Method

- A) Set up the equipment as in A, B and C above.
- B) Repeat the same test sentences as before not forgetting to mark your position each time you move, but this time travel vertically around the instrument. This is not easy, even when the microphone is mounted on a floor stand, calling as it does for a certain amount of physical agility. If a table stand is being used pick it up and hold it at the correct distance above your head and look up as you speak.
- C) Again check playback very carefully.

Did those antics make you feel foolish? Probably so, but if it is any consolation your author has often carried out such tests himself in front of quite large audiences so there should be no need to feel self-conscious about it in the privacy of one's own home. The results tell a very interesting story. If an omni-directional microphone is being tested in this way it will be found that its directional pattern exists in space as a sphere — not just as a circle. In the endless search for the best ways to record the sounds we want without the sounds (noises) we don't want this single fact reveals a serious source of interference. If such a microphone is stood on the hard, reflective surface of a table it will pick up the sound that is bounced upwards just as easily as it registers the sounds directed at its frontal face. Such a microphone stood in the angle of a corner of a room will give a highly reverberant version of a sound. When directional microphones are being put through their paces special note must be made of their "three-dimensional" characteristics. The information disclosed by these investigations is essential to the proper use of microphone equipment under the wide variety of conditions that will occur in practical use.

Please turn to Page 134



Recording studios use it every day.

'Scotch' low noise 'Dynarange' Magnetic Tape is the choice of top recording studios such as CBS, Decca, De Lane Lea, Lansdowne and Pye. Both the tapes and cassettes are now available in smart

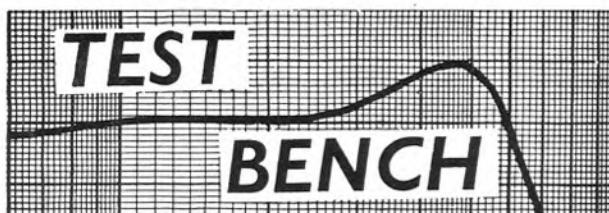
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TELETON T-630G

INVESTIGATED BY D. KILLIK

MANUFACTURER'S SPECIFICATION

Teleton T-630G

Power Source: Six 1.5 Volt dry cells.
A.C. mains.
Power Consumption: Less than 5 Watts at 220 Volts.
Battery Life: Conventional cells more than six hours continuous rating.
Tape: Compact Cassette.
Tape Speed: 1 $\frac{7}{8}$ inches per second.
Recording System: A.C. bias.
Track System: Double half-track.
Erasing system: A.C. erasing
Output: 1.2 Watts maximum 0.8 Watts undistorted.
Frequency Response: 50 to 10,000 Hertz.
Speaker: PO-1075 VC8. 10 x 7 cms.
Inputs: Microphone 200 Ohms, Aux. (DIN) 330 kOhms.
Output: External speaker 8 Ohms.
Dimensions: 31.1 cm (W) x 17.7 cm (D) x 7 cm (H).
Weight: 5 $\frac{1}{4}$ lbs.
Recommended Retail Price: £40.0.0. inclusive of purchase tax and accessories.
Distributor: Teleton Electro (Distributors) Ltd., Teleton House, Robjohns Road, Widford, Chelmsford, Essex.

THIS MONTH we are investigating a mains/battery portable mono Compact Cassette machine, the Teleton T-630G, a recorder selling at £40 inclusive of purchase tax and accessories. At this price level we must regard the equipment as being in the "budget" class; it is also noteworthy because of its built-in mains facility and its larger-than-usual loudspeaker which should offer better audio quality than that to be obtained in the smaller Compact Cassette portables. On the other hand its larger size and weight might be thought to make it slightly less convenient for carrying although an excellent leather case complete with shoulder strap is included in the price.

Frequency Hz
63
100
125
250
500
1000
2000
4000
6000
8000
10000
12000



TELETON T-630G TEST CHART

Overall Response dB	Signal/Noise Ratio Battery dB	Signal/Noise Ratio Mains dB	Distortion %
-10			
-3			
-2			
0			
0			
+1.5			
+3			
+4.5			
+5.5			
+4.0			
0			
-3.0			
0.24%			

NOTES — The Overall Response figures relate to record and playback. For Signal-to-Noise Ratio the tape was recorded at standard reference level and then the input signal was removed from the record amplifier. With the tape still in motion the (virgin) tape noise in relation to signal level is quoted "unweighted" for both battery and mains operation. Alternative "weighted" measurements are given in the text. Distortion is quoted against a 333 Hz. signal recorded at the same reference level and 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: Brüel and Kjaer Signal Generator, B & K Frequency Analyser Type 2107, B & K Level Recorder Type 2305 and Gaumont-Kalee Wow and Flutter meter.

Argument for and against cassette as opposed to open spool is endless — now, however, following the advice given in last month's *TAPE Recording Magazine* on editing and splicing Compact Cassette tapes, it is hoped that at least one objection has been answered. As to performance, we can only judge from the results of laboratory investigations such as this, which, when combined with personal opinions based on practical experience, give a very fair idea of the potentialities of the system.

So let us turn at once to our technical investigation to see how the T-630G shaped up under the most rigorous testing. It should here be mentioned that

our usual technical reviewer, Robert Hirst, was away on holiday when this machine arrived and so we made use of the services of an independent laboratory, H. F. Engineering of Sunbury-on-Thames.

Taking frequency response first, we were a little disturbed to find that the overall figures at 63 Hz. were 10 dB below reference level at 333 Hz. The ascent is steep, however, giving minus 3 dB at 100 Hz. and minus 2 dB at 125 Hz with flat reached at 250 Hz. What does this mean in practical terms? From the point of view of "high fidelity" we could say that there is very little output at the bottom end of the spectrum, a lack which would probably not be noticed

under any conditions other than listening to the output via a really good external loudspeaker. Checking the manufacturer's specification we find that the claim for frequency response is 50 to 10,000 Hz. without any tolerances being quoted. As certain other manufacturers of very much more expensive equipment adopt the same bad policy in the publication of their figures we cannot be too hard on Teleton for being equally evasive. The truth is that response figures without tolerances are quite meaningless and so might be thought to hint that the manufacturer had something to hide. In these days of good audio we usually find that, as in this case, performance is quite respectable and certainly nothing to be shy about.

Apart from that fall-off at the lower end we see from the test chart that quite a satisfactory output (only 3 dB down) was recorded at 12,000 Hz – well above the specification claim. Maximum rise is of 5.5 dB at 6,000 Hz., but this accentuated top is easily corrected by proper use of the tone control provided on the machine. This gives a simple top cut facility with a reduction in output of 12 dB at 10,000 Hz. when set to figure 0 on the scale. All our response readings were taken with the tone control set at figure 10 on the scale, which we regarded as the "flat" setting.

As the machine can be operated on either dry cells or directly from 240 volt A.C. mains the signal-to-noise measurements were taken twice, once for each power source, and are quoted in our chart as "unweighted" against a reference level at 333 Hz. Purely as a matter of interest these were then repeated, but this time the standard "A" weighting was introduced so that readers can appreciate the difference in the results that are obtained when using the two different measurement standards.

It is important to note at this point that when a tone was fed into the machine to full modulation on the meter (zero), this was found to be 4.5 dB below the reference tone used. In other words our noise and distortion readings relate to recordings at 4.5 dB above the zero modulation indication.

Unweighted noise on battery operation was shown to be 41.5 dB, and this fell to 36.0 dB when using mains supply. It is usual to find such a deterioration on mains/battery equipment; as with other machines of this class that we have reviewed in the past the user is recommended to *record* in the battery mode whenever possible so as to obtain the advantage of the improved signal to noise level. When weighted to the "A" scale (this involves the introduction of filters which are claimed to relate the

noise content to the mechanics of human hearing) we have a figure of 46.5 dB on batteries and 43.0 dB on mains. As will be seen there is a substantial difference between the "weighted" and "unweighted" readings – one should always check noise specifications carefully to see which method of measurement has been used as otherwise the figures are meaningless.

Distortion (total harmonic) as measured at our reference level was shown to be 5%. This compares with the "under 3% hi-fi standard" and is in fact equal to the level accepted by some manufacturers for good-class domestic open spool equipment. In a cassette machine at this price it can therefore be regarded as satisfactory.

It was found that an input of 20 mV was required at the line in connections of the 5-pin DIN socket to produce reference level and the maximum undistorted output was shown to be 3.5 Volts; this was obtained around setting number 7 on the volume control when reproducing the reference level signal.

Speed stability was surprisingly good, with total wow and flutter measured at 0.24% RMS. In the long term stability it was found that there was only a very slight speed drop when running on batteries as compared to mains (0.5%) and the speed accuracy was not only excellent but was also outstandingly consistent.

In the printed leaflet the impedance at the Aux Input is quoted as being 330 Ohms, whereas the specification in the instruction manual refers to 330 kOhms. The latter is, of course, more correct; the former is presumably a misprint. Impedance will vary according to frequency and we established a figure of 143 kOhms at 1,590 Hz.

Summarising our technical investigation we can say that the T-630G offers a performance standard that varies only from satisfactory to excellent with the one exception of the fall-off in response at the extreme end of the spectrum. For many outdoor recording applications an attenuation of low frequencies is regarded as highly desirable as much of the unwanted background noise occurs in this area; this "fault" could therefore be turned to practical advantage. General impression so far: "Good value for many – a machine that should be seriously considered within its price range."

First reaction on user test was one of surprise at the size and weight. On checking against the dimensions of the usual cassette portables it was found that the T-630G is in reality only about one-and-a-half inches longer and wider; it seems to be bigger because it is carried with its longer side uppermost instead of the other way round. The weight of

5½ lbs does not include batteries, and when these are in place the user certainly knows he has it on his shoulder. The leather shoulder strap is rather narrow and we would have liked to have found a broader pad threaded on as an aid to comfort but none was provided. Design and manufacture of the black leather carrying case is really excellent; it is strongly made and offers real protection without impeding use.

Tape transport is controlled by means of a row of keys giving from left to right: Record (bright red in colour), Rewind, Fast Forward, Play and Stop. There is no Pause control included. A small red-coloured lever ejects cassettes automatically and with no little force. This gadget works very well indeed, but the user is warned to be ready to catch the cassette to prevent it flying gracefully through the air. Tone and Volume are a pair of very large, separate edge-type controls, each with a numeric scale and positioned so that they can easily be used when the machine is shoulder-slung. For convenience of use they are far and away the best we have come across on cassette machines of this type. The latter serves the dual function of Gain Control when in the Record mode, and it really is a pleasure to use.

A very small meter is both Level Indicator and Battery Test; unfortunately it has been sited on what would be the "top" when standing flat and so is not immediately visible from the shoulder position. That is the only lay-out criticism we can make. Connections are by a 5-pin DIN socket on the upper edge (this also contains the external speaker outlet – no reason why not except it is an unusual connection for this facility) and sockets for the very sensible double pin jack plug on the microphone. This latter is included in the price and is neatly stowed within the machine; the lid of this little cubby-hole cleverly forms an adequate microphone stand.

At the side of the DIN socket we find a slide switch giving Manual control of levels in one direction and Automatic control in the other. A separate, completely detachable mains lead (provided) fixes into a small socket at the rear and the dry cells (6 1.5 Volt) slip into a properly marked compartment in the underside. The carrying strap clips on to two very substantial lugs screwed into the sides of the machine itself – a much safer method than fixing them to the carrying case.

Operation of all the tape transport control keys was clean and positive. We were concerned when it was noted that with the Record key engaged both the Fast Forward and the Rewind functions could also be engaged. However it was

noted that the erase circuitry does not operate unless the Play key is depressed so there is no danger of accidental erasure in this way. Nevertheless a better interlock system should be provided so that this state of affairs does not arise. Apart from this one small point all the other functional controls proved to be highly satisfactory. The machine is delightfully quiet mechanically and during the test period it performed reliably in spite of deliberately "rough" treatment.

Since one of its most important features is the provision of a loudspeaker larger than that found in the smaller models we were curious to discover whether or not this really does improve sound quality. One of our favourite Musicassettes was inserted in the cassette compartment, the lid was closed and the playback key depressed. After adjusting for correct volume level we sat back to listen and enjoy. Of course this was not "high fidelity," but it really was a most acceptable sound quality — much better than would be expected from a small portable.

Subsequent tests on both recording and playing back revealed an ease of use and consistency of quality that endears

the equipment to the heart of the enthusiast. It really does work very well indeed. Next we had to see what happens when we feed the output into an external amplifier. Taking the output from the DIN socket it was first noted that there is no provision for muting the internal speaker in the T-630G. However in view of the high output voltage only the tiniest amount of gain was required at the volume control on the machine (setting about 1½) and at that level the internal speaker was virtually inaudible. Our technical investigation had suggested that there might be some noise up in the 25,000 Hz. region which, although quite inaudible in itself, could cause a beat lower down the spectrum. In fact this did not occur and with the tone control in its "flat" position (no top cut at all) the level of hiss and upper band noise was quite acceptable.

The microphone included in the price has the usual remote control Stop/Start switch, and again we would warn users to be careful not to leave the capstan and pinch-wheel under pressure for too long through the operation of this switch. It is best confined to only brief pauses — for long ones the Stop key should be depressed so as to leave the machine in

"neutral" until ready to start recording again. Quality from this microphone is well up to standard.

One difficulty was encountered in our user test, and this was caused by the lack of Pause control. It is not possible to adjust the recording level unless the tape is in motion in the Record mode as this is the only condition under which the meter is operative. We felt this to be rather a pity; the addition of a Pause control does help to make life easier when setting levels for difficult recordings.

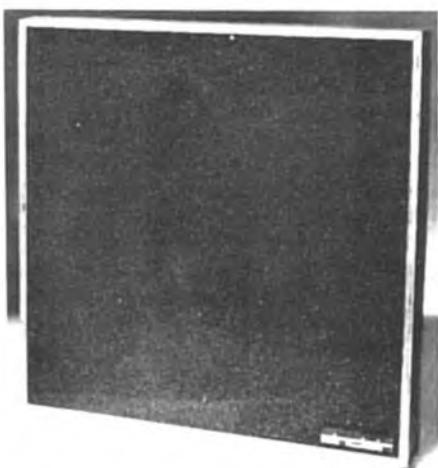
The sum up the T-630G we can say that here is a very honest little machine that does just what it sets out to do — to offer low-cost record/playback facilities with a superior built-in sound quality. We have criticised one or two small points, but none of them are of very great importance for general use. The very smallest cassette machines do have a rather pathetic sound from their tiny loudspeaker units, a disadvantage that this machine overcomes. We would therefore particularly recommend the T-630G for the user who requires portability plus reasonable sound from the built-in speaker, together with reliability and generally good performance standards within this price range.

ACCESSORY REVIEW

SINCLAIR Q 16 LOUDSPEAKERS

IN OUR ISSUE dated June 1968 I was pleased to be able to publish my review notes on the Sinclair Q 14 loudspeaker enclosures. This model has now been superseded by the Q 16, and through the courtesy of Sinclair Radionics Ltd. I have been able to form an impression of the performance standard of this latest model.

At the risk of repeating some of the comments contained in the earlier review it is necessary to place the enclosures firmly in perspective in relation to size, cost, performance and efficiency as compared to the more conventional "high fidelity" but high cost transducer systems. So to recapitulate readers are reminded that in audio the terms "system" or "enclosure" when applied to loudspeakers imply one or more drive units housed in a scientifically designed



box which through its shape, construction and size has the effect of projecting

into the listening area the audio signals fed to the transducer with a minimum of distortion, resonance, coloration and other unwanted noises.

The cabinet or enclosure design and construction is at least as important as the performance of the cone, coil and magnet assembly making up the drive unit. A good loudspeaker mounted in an ordinary wooden box will sound terrible. This is the reason why the built-in speaker equipment featured in many tape recorders and virtually all domestic radios and radiograms (not to mention television sets) is hopelessly inadequate when considered in terms of true "fidelity".

Unfortunately it is this requirement for observing the basic rules of acoustics that makes quality loudspeaker enclosures both costly and large. A price of around £30 each would cover only the lower end

of the price bracket; at the Audio Fair at Olympia enclosures costing approximately £150 each were being demonstrated. The cost of the Sinclair Q 14 was £7.19.6 whilst that of the Q 16 is £8.19.6 due to increased costs and purchase tax.

In last month's issue particular reference was made to the impossibility of referring to recording without at the same time relating it to playback. Once the truth of this is accepted (and there can hardly be any doubt about the validity of the statement) it follows that good loudspeaker equipment is as important for the recording enthusiast as is the performance of the recording machine itself. In view of the high cost of quality loudspeaker enclosures this poses obvious and immediate financial problems.

It is for this reason that I was so pleased to be able to review the Q 14s. and am now equally happy to discuss the relative value of their successor, the Q 16. As with the earlier model the Q 16 is a scientifically designed enclosure, not just a drive unit in a box. The main differences between the two models lie in the improved and updated styling and a claimed frequency response extending to 16,000 Hz. as compared to the upper limit of 15,000 Hz. in the sample last investigated. The design is still based on a square frame measuring 9½ in. along each side but this now takes the form of a solid teak surround with an unusual all-over cellular foam grille covering. It is said that this latter was chosen as much for its appearance as for its ability to pass all audio frequencies unimpaired, and it does indeed offer a most original and neat appearance. Instead of a loose detachable baseboard support is provided by means of a simple wooden strut fitted with a soft pad for furniture protection at the rear.

The acoustic enclosure itself is a sealed sound chamber constructed from what is described as a special high density, ultra low resonance material. The latest bonding techniques are used in its production. A pair of screw terminals situated in this housing give connections for the audio signals and correct phasing is indicated by a dab of red paint at one of these points. The whole is small in size, light in weight and although unpretentious in appearance will fit satisfactorily into the decor of almost any living-room. With an input impedance of 8 Ohms the Q 16 will suit almost any transistorised amplifier whilst its power handling capacity is said to be 14 Watts RMS.

I can well remember the surprise I received when first listening to the Q 14s. Strictly relating performance to cost it seemed to be quite incredible that such a thoroughly acceptable sound should be produced from an enclosure in this size and price range. Now with the Q 16s we

have to pay a little more but performance is at least as good and we have the benefit of a definite improvement in looks.

To avoid any misunderstanding it must be made quite clear that I do not believe it is possible at the present state of the art to be able to talk about true "high fidelity" sound reproduction from an enclosure of this kind. Nevertheless one must be practical and I have no hesitation whatsoever in again restating my opinion that these modest units are capable of giving the listener a sound quality infinitely superior to that obtained from any non-scientifically designed enclosure and which will stand comparison with a great many very much more expensive commercial models. The Q 14 was described as representing some of the finest value for money; even at the slightly higher price the Q 16 is still well within that category.

One disadvantage of small enclosures lies in their relative "stiffness". By this it is meant that a comparatively high power is required from the amplifier in order to drive them efficiently with a minimum of distortion. The Q 16 is no exception. I would recommend a minimum of 10 watts RMS to achieve clean audio quality. This means that such enclosures are not really suited for use with the older valved tape recorders having an output of perhaps 2½ to 5 watts at the extension speaker socket. With this one reservation — that sufficient power should be available to drive them — the use of the Q 16 loudspeaker enclosures will dramatically improve the sound quality that can be heard from the built-in loudspeaker provided with any commercial recording equipment provided today. Furthermore they offer an ideal solution for the person who is interested in investing in high quality audio equipment but cannot face the crippling expense of conventional loudspeakers that will do justice to the rest of the set-up. Again it is recommended that Q 16s should be used as a more or less temporary expedient. Not only will they give thoroughly acceptable sound quality for the next year or two, but when the day comes that the enthusiast can really afford that pair of coveted full-range enclosures then his little Sinclairs will still be capable of performing sterling service as extension speakers in another room. It is so much wiser to economise in this way rather than down-grade all the equipment because the addition of loudspeaker costs to the total renders the whole impossible.

I do know of several recordists who have found another excellent practical use for Sinclair enclosures. Because of their small size and weight they are ideal for use as monitoring speakers when working on recording assignments away from base. In this application one should

strictly use the finest loudspeakers available so as to be able to form correct judgments as to recorded quality. In practice one has to compromise and the Q 16s could be regarded as ideal from that point of view.

In summarising this equipment it could be said that the Q 16 enclosure is a worthy successor to the Q 14. In absolute terms its manufacturer's claim for "high fidelity" could be challenged but at its size and price it represents outstanding value for money and so will materially assist the many people who have to work to a tight budget. They might not get ultimate high fidelity as the purist thinks of it but they will get a sound quality that will give satisfaction and enjoyment for many years to come.

D.G.K.

TEST BENCH

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'The Sony TC-630 represents exceptionally fine value for money... one of the most sensible machines we have seen for some time.'

DENYS G. KILICK, TAPE RECORDING MAGAZINE, DECEMBER 1969

Model TC-630—the complete stereo sound control centre. Echo and sound-on-sound recording at the flick of a switch. Multiple inputs for stereo tuner, microphone, auxiliary speakers and optional turntable. Further refinements include three heads, three speeds, dual VU meters, retractable pinch roller, noise suppressor, and scrape filter.

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Specification

Recording system 4-track stereo/mono recording and playback.

Power requirements AC 100, 110, 117, 125, 220 or 240V, 50/60 Hz.

Power consumption 40 watts.

Tape speed 7½ ips (19 cm/s), 3½ ips (9.5 cm/s) 1½ ips (4.8 cm/s).

Reel capacity 7 in. (18 cm) or smaller.

Frequency response 30 Hz–22 kHz at 7½ ips; 30 Hz–13 kHz at 3½ ips; 30 Hz–10 kHz at 1½ ips.

Bias frequency 160k Hz.

Wow and flutter 0.09% at 7½ ips; 0.12% at 3½ ips; 0.16% at 1½ ips.

Power output 15 watts per channel.

Signal-to-noise ratio 50 dB.

Harmonic distortion 1.2% at rated output (overall); 0.5% at rated output (amplifier).

Level indication Two VU meters.

Inputs Microphone: sensitivity –72 dB (0.2 mV), impedance 250 ohms.

Tuner: sensitivity –22 dB (0.06V), impedance 100k ohms.

Auxiliary: sensitivity –22 dB (0.06V), impedance 560k ohms,

Phono input (MM or MC cartridge): sensitivity –53 dB (2 mV), impedance 14k ohms.

Outputs Line: output level 0 dB (0.775V), impedance 100k ohms.

Headphone: output level –28 dB (30 mV), impedance 8 ohms.

External speaker: impedance 8 ohms.

Lid speaker: impedance 8 ohms.

Rec/PB connector Input: sensitivity –40 dB (7.75 mV), impedance 10k ohms.

Output: output level 0 dB (0.775V) impedance 100k ohms.

Dimensions 17½ in. (w) x 20 in. (h) x 11½ in. (d).

Weight 46 lb. 3 oz.

Supplied accessories Microphone (F-45) (x2), Sony pre-recorded 5 in. tape, Sony empty reel (R-7A), connection cord (RK-74), head cleaning ribbon, reel cap (x2).

Optional accessories Speaker system (SS-3000), telephone pick-up (TP-4), stereo headset (DR-5A) (8 ohms), microphone mixer (MX-6S).



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NATURE NOTES

FOR APRIL

BY RICHARD MARGOSCHIS

MENU:—"SCOTCH" broth or Frogs Legs garnished with spawn sauce. Fallow Deer cutlets with Pipit's Parson's Noses, laced with Fox Tails !

The sudden relaxation, when we sat down to dinner at 8 pm, after ten solid hours of listening and discussion at the final judging of the 'Scotch' Wildlife Recording Contest was such that, before the waiter arrived, we were concocting our imaginary menu; prompted, of course, by some of the species we had been listening to. The panel consisted of: John Burton, Sound Librarian, BBC Natural History Unit; Lawrence Shove, professional natural history recordist; Phillip Hobson, Senior Research Specialist, 3M Co., and myself. The job in hand was to listen to over 60 recordings and select a winner and two others in each of four classes.

The new Junior Class was very disappointing; there were only ten entries and yet I understand that the recent BBC "Animal Magic" contest, run on similar lines, attracted well over a hundred. However, the quality was very gratifying and 16 year old C. J. Barratt's recording of a lesser whitethroat, original at 1 $\frac{1}{8}$ ips. was a worthy winner.

The three main classes attracted a total of 208 entries from 54 individuals, 30% up on last year; winners were listed in last month's issue of TAPE Recording Magazine. It became evident in the early stages of the pre-judging that the quality of the entries was considerably better than last year, and that the majority of recordings were of more recent origin; in fact, one of the highly commended ones was made barely a month before the closing date. Final judging was by no means easy and it became particularly difficult to separate the last

few in each class, but this fact should not be allowed to deter you from entering any future contest if you have not won a place in this one. Nevertheless, it does bring out certain points to be watched.

To start with, it must be realised that presentation of the recording is absolutely vital, and by this I do not mean that it starts and ends with a quick fade and has leaders and trailers suitably marked, although this, of course, is a considerable help. It is attention to detail that is necessary, such as the removal of unwanted noise; but here I must sound a warning — be sure what editing the rules allow in any competition. In certain types of natural history recordings it is only too easy to record handling noise, an accidental tap on a reflector or something like that. If such a noise comes in a quiet passage it ruins the recording but can so easily be removed with a razor blade. Several first-class efforts were eliminated because of this sort of thing, and one of them after getting within an ace of a first place.

The "Atmosphere" section seems to have presented considerable difficulty in interpretation; many of the entries were simply not atmosphere recordings at all. One point which interested me very much was the fact that two of the three entries gaining a place in this section were made with a reflector; the winner used an open microphone. The mistake made by one highly placed entrant was that he panned the reflector across a wide area during the latter part of the recording, with the result that a changing background spoilt the effect.

One knotty problem is the amount and type of background noise which can be tolerated. My own belief is that this depends so much upon the subject. For instance, with the song of an individual species I would not want to hear any of background roar but I do want to hear just sufficient "atmosphere", such as the faint calls of other birds. On the other hand, in an unusual recording, possibly obtained on the spur of the moment and under difficult circumstances, I would accept some degree of unwanted noises; but not "plonks."

Richard Savage's winning entry in Class 1, of a meadow pipit, shows quite clearly that it is not essential to look for the unusual; here was a good, clean, well modulated and well presented recording of a fairly common bird. Obviously care had been taken to choose the right weather conditions — the bird is found in places that can be very windy — and it turned out a winner. Alan Ferry also took advantage of weather conditions, and with rain falling in the gutters and thunder rolling well in the background, he got a perfect balance of a dawn chorus which really did have some atmosphere.

I have already mentioned that the BBC is running a similar contest this year in connection with European Conservation Year. The rules differ somewhat from the "Scotch" contest and points to watch are that *no editing whatsoever* is allowed; the original must have been made at *not less than 3 $\frac{1}{2}$ ips.*, and a strict leader tape colour coding applied to each entry. Send for details and entry forms to John Burton, Sound Librarian, The BBC Natural History Unit, Whiteladies Road, Bristol BS8 2LR. Closing date for entries is September 1, 1970.

TAPE WORKSHOP from Page 127

EXPERIMENT 3. LIVING ROOM BECOMES STUDIO

Equipment required: All as for the previous experiments.

It is intended that our work this month should be related to the record/playback research detailed in the last Tape Workshop. In this we established a fairly simple relationship between recording levels and the dynamic (loudness) of the signal (voice). Optimum conditions were found for voice recording, but these ignored the directional qualities of the microphone used. Now, with the benefit of our practical demonstrations of these properties, we can modify our voice/dynamic/level arrangement by adding the last remaining factor, that of studio acoustic.

Now the "studio" might well be the living room; it becomes a studio when one starts *using* it as a studio and that implies both acoustic adaption and the act of recording.

Method

- A) Set up all equipment as before but in such a way that the microphone can be easily moved to different positions within the room.
- B) Set levels for "optimum voice recording" as ascertained last month.
- C) Take a test voice recording and play back so that the sound reproduces the live voice as nearly as possible in

loudness and quality.

- D) Listen again, but this time for differences in sound quality introduced through the direction properties of the microphone. These will probably be due to reflected sound bouncing back to give a "boomy" effect, but might also include the break-through of outside noise due to a sensitive area of the microphone being directed towards the outside street or open window
- E) From our knowledge of directional properties change the position of the microphone within the studio. Use soft furnishings, curtains etc. to reduce reverberant reflections. There are no rules here — all is done by trial and error. Make small changes in microphone position and check comparative results by recording the listening. Blankets might be suspended from the picture rail to investigate the kind of sound that will occur in a thoroughly "dead" acoustic. It is most unlikely that any ordinary living room will be so "bright" as to require such extreme measures as permanent fixtures.

One of the delights of sound recording is the fact that the mere acquisition of expensive equipment does not of itself bring any guarantee of fine sound quality. To the contrary, the more costly the gear the greater the obligation on the user to investigate its potentialities completely so as to be able to make the best use of it. And if you should be down in the very lowest price bracket of all why not take the trouble to find out just how good your equipment really is when properly used?

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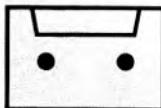
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Music

Music cassette Reviews

Consultant Critic Katinka Seiner

VIVALDI. La Stravaganza Concerti Nos. 1-6. I Musici. Philips CPC 0069 49s. 11d. Including purchase tax.

This collection of concerti, twelve in all, is known by the collective title of *La Stravaganza* which means literally a whim or fancy. Of the twelve concerti we have the first six in this album. It should be mentioned that all twelve pieces have the same instrumentation: solo violin, strings and basso continuo (cello and organ). Several movements of this opus were later used by J. S. Bach.

Has the gracefulness and stateliness of the Baroque period ever been excelled? Some might think not. Personally I find the compositions of Vivaldi bring a sense of real satisfaction that is lacking in many modern composers. Today the emphasis — rightly or wrongly — lies in questioning an established order of things. Vivaldi and his contemporaries accepted in a way that we no longer tolerate. But, as a result, the music of this period has, for me at least, a tranquillity and beauty that makes a refreshing change amongst the doubts of the twentieth century. It is a rest, a pause for spiritual uplift. And who would dare to suggest that as such it is not desperately needed?

Vivaldi was born in 1678 and died in 1741. His father was a violinist and he himself played the instrument. It is worth mentioning that many of the famous violins that are still played at the present time originated from this period. In this way they provide a realistic link between the composer and modern life. Most of these instruments have been recorded at one time or another and one cannot help wondering what Vivaldi's reactions might have been to electronic sound reproduction.

But we are getting away from the point. Because of his interest in the instrument it takes an important part in most of his famous works. He himself had a profound influence on the development of the concerto together with Corelli and Geminiani. There is some disagreement amongst musicologists as to the value of Vivaldi's compositions. It has been said that they are no more than mere displays of virtuosity, but such argument is refuted by the fact that J. S. Bach studied and arranged a number of his violin concerti for clavier and organ. His present day popularity is undoubtedly due to his mastery of the concerto form and rich melodic line.

In this album we have extreme clarity of line and expressive musical phrasing from the virtuoso members of I Musici. Recorded quality matches performance giving good internal balance and a realistic sense of presence. As such an album that can be thoroughly recommended.

OPEN. Brian Auger, Julie Driscoll and the Trinity. Marmalade 914 554. 47s 6d including purchase tax.

Opening this collection provides many

surprises. There's a free use of all manner of audio gimmicks, but the "clever" treatment has been handled with restraint so that the music always "comes out on top". Quite a change from some presentations where the brilliance of the engineers removes the performers as far as possible away from the listener.

It's a nice combination, this: Brian Auger, Julie Driscoll and the Trinity. Pity the recording does not have the searing clarity that can be achieved even at 17/8th ips. Never mind, voices are well in the foreground and words can be heard. Their selection of numbers is interesting. *In and out, Isola Natale, Black cat, Break it up, Goodbye jungle telegraph, Tramp, Why* (am I treated so bad), *A kind of love in, Lament for Miss Baker and Season of the witch*.

Performance is competently professional throughout giving us an effortless flow of entertainment and variety. Some pop collections leave me feeling utterly depressed; this album has the reverse effect — it both pleases and elevates. Julie Driscoll has a very personal artistry that *blends* but never *dominates* in this production. And there's humour too. What a stroke of genius to precede *A kind of love in* with a baby's cries — and to end it with a scream! It's all good fun that never bores.

So for contrasting moods plus relaxation plus enjoyment try opening Open. I don't think you will be disappointed.

BYE BYE BLUES. Bert Kaempfert and his orchestra. Polydor 911 031 47s. 6d. including purchase tax.

Good rhythms are fascinating. Perhaps they appeal to some mythical, ancient call of the primeval virgin forests. Blame my own native ancestors if you like, but I can never resist the really good beat. It is exciting and wholly satisfactory to listen to music which not only claims to be rhythmical but is. This is the crux of the matter. Above all else this album gives us rhythm.

Too many performers of light music take advantage of their listeners by offering shallow, rhythm-less arrangements. But not Bert Kaempfert in this collection of old favourites. Dated? Perhaps they are. But they all come across with a delightful freshness born of their rhythmic interpretations. All the numbers are played with zest and imbued with pride of performance. As such they inspire pleasure and enjoyment in the listener. We have some superb trumpet playing. I grieve indeed at not being able to give you the soloist's name, but once again Polydor fail to give us any real information in their sleeve notes.

Bert bids Bye Bye to Blues with: *Bye Bye Blues, Remember when, When you're smiling, Tahitian sunset, Once in a while, Steady does it, It makes no difference, You stepped out of a dream, Wiederseh'n, I'm beginning to see the light, Melina and Out of nowhere*.

Most enjoyable. An album that should not be missed.

VODKA COCKTAIL. Fritz Schultz-Reichel and his Sextet. Polydor 911 160. 47s 6d including purchase tax.

Nostalgic dreams. Glittering virgin snow over the endless miles of the steppes. Peasants, heavily laden, trudge wearily. And their women, rosy-cheeked, dance in the soft light of evening. Sadness. Above all sadness. A wistful melancholy, all pervading. These abstract qualities — and others more tangible — emanate from this album. It goes even deeper. One cannot help wondering: are the Russians really so different from us? I don't wish to enter into a political argument so should hasten to add that the reference is to emotional make-up and outlook on life. There is a heavy gloom from which they rarely seem to be able to free themselves, a despondency which calls loudly from "Vodka Cocktail" — with rhythm, humour and all the other Russian qualities. Yet all the time there is an undertone of melancholia.

This album gives us: *Song of the Volga boatmen, Black eyes, Moscow nights, From Russia with love, L'amour perdu, Habe Mitlied, Steppes all around, Monotonously rings the little bell, Evening bells, Somewhere my love, The red sarafan, Poljanka and Cossack patrol* on one side. Turn the cassette and we find: *Chanson triste, Melody in F, Romance, The song of Atman Platoff, Steady on coachman, Kalinka, Stenka rasin, Two guitars, A summer filled with love, Bublitschki, Hindu song, Prelude in C sharp minor, If I were a rich man, Song of the Volga and When the moon shines*.

What a programme! We certainly get our money's worth with this collection — and all of it liberally interpreted by Fritz in his imitable swinging style.

Many of these songs are well known and loved (in their original versions!) all over the world, songs like *Kalinka, Stenka rasin, Hindu song* and so on. The *Hindu song*, for instance, receives an interesting jazzed-up treatment, but even this does not obscure its inherent melancholy. It was something of a surprise to find *If I were a rich man* included in this album, but of course it does depict a certain facet of Russian life so it has a right to find itself in a "Russian Cocktail" — and cocktail it is.

I enjoyed listening once again to *Song of the Volga boatmen, The red sarafan*, and in fact the whole of the delightful selection which is performed with that easy professionalism that marks the real artist. This scheme of things, the varied collection (or cocktail) meets with my wholehearted approval; it brings back so many old friends — and memories, too. Recorded quality is good and perhaps the album's chief value lies in its pleasantly unobtrusive quality. It can be heard without the need for conscious listening. And it can be enjoyed that way, too.

Music

Open Spool Reviews

Consultant Critic Katinka Seiner

7½ ips STEREO

Equipment used for review tapes: Amplifiers—Quad valued and Ferrograph F303. Loudspeakers—Celestion and Jordan-Watts. Tape Recorders—Akai 3000D and Tandberg 64X

STEREO SAMPLER. Reprise S9-1 7½ ips four-track stereo. Special offer price 63s including purchase tax and with one 7-inch spool, 2,400 feet, ½ mil Mylar base Recotape recording tape.

This album comprises a mixed bag of some of our top-line popular artistes and is an import from America. It is being offered by Music Tapes (Mail Order) of 26, Water Lane, Salisbury, at a price which includes a 7-inch spool of double-play tape. On the basis of recommended retail prices for the tape (63s.) the cost of the recording would appear to be nil. So, for the first time in these reviews, we have to decide what value we might expect to get – for nothing.

The repertoire comprises: Frank Sinatra, *Indiscreet*; Esquivel, *I get a kick out of you*; Dean Martin, *In a little Spanish town*; Chuck Sagle, *The moon was yellow*; Shorty Rogers, *Samba do Lorinho*; Les Baxter, *Bird of Paradise*; Frank Sinatra, *Exodus*; Sammy Davis Jr., *What kind of fool am I*; Neal Hefti, *Coral reef*; Eddie Cano, *A taste of honey* and finally Frank Sinatra again with *In the still of the night*.

Apart from a couple of "clunks" at the beginning before the programme starts the recorded quality is excellent. The stereo is undoubtedly genuine – if anything a little too directional. The only possible criticism is of a slightly obtrusive hiss, but this can easily be removed by applying a little top cut at the amplifier. If you wonder at the connection between Sinatra and *Exodus* the explanation is simple – Sinatra conducts.

I would hesitate to put a cash value on this collection, but knowing the cost of 7½ ips stereo tapes it must be considerable. Certainly it gives us all that we have come to expect from the faster speed and modern recording techniques. So if the programme appeals, and it should appeal to most, this special offer would appear to represent exceptional value for money. We have not investigated the quality of the virgin tape which is included in the price, but assuming it to be up to standard (and there is no reason to suppose otherwise) this purchase should mean a substantial cash saving.

THE BEST OF CORONET. Coronet CSL 7415 7½ ips four-track stereo. 57s. 5d. including purchase tax.

Here we have another "sampler" tape,

which, as its title suggests, contains some of the best items from the Coronet repertoire. The album gives us a varied selection and so makes an interesting composite entertainment.

Items include: *Afrikaan Beat* from "A Tribute to Bert Kaempfert" by Bobo Johnson and his orchestra, *Zorba the Greek* from "Tijuana Party" by The Borderlanders, *Red roses for a blue lady* from "A Tribute to Ray Conniff" by Dom Dominic, chorus and orchestra, *Sabre dance* from "Provocative Sounds of Brass Strings and Percussion" by Larry Moreton and orchestra, *Crazy Rhythm* from "The Fabulous Organ Sounds of Laurie Lee," *All the things you are* from "The Golden Age of Melody" by Larry Moreton, piano and orchestra, *People* from "The Very Thought of You" by Eric Winstone and orchestra, *Stranger on the shore* from "Hammond Organ Favourites" by Harold Smart, *Havagh Nagilah* from "Far Away Places" by Larry Moreton and orchestra, *I left my heart in San Francisco* from "Electro Organ Dynamics" by Larry Moreton at organ with percussion, *In a little Spanish town* from "Sound in the 4th Dimension" by Larry Moreton and orchestra concluding with *Tammy* from "Satin Strings and Velvet Brass" by Sonny Goldman with The New Concert Orchestra.

Quite a list. These are all popular items or popular arrangements, some of which are not – to my ear – musically very satisfying. Recorded quality varies, which is hardly to be wondered at since the different numbers obviously originate from an equally diverse collection of masters. Some are very good, others are not quite so brilliant. In at least one number the trouble is "over brilliance" with a decidedly harsh, unnatural quality to the strings.

However, tonal correction will help to bring the whole back into line, and taken all-in-all the album offers great interest in its diversification.

As I said earlier in this review, all the items do not appeal to me personally, and neither does their treatment, but they are so well-known that readers will be only too well aware if the repertoire is likely to meet with their approval. If it does that it could be regarded as a good buy at the price.

3½ ips STEREO

BIRD OF PARADISE. Wout Steenhuis and The Kontikis. Columbia TD-TWO 271. 3½ ips four-track stereo. 41s including purchase tax.

The Steenhuis recipe seems never to fail. Certainly it succeeds in this particular cocktail of the Islands. All pleasant background music, this, but so well recorded it can be listened to if one so desires.

Playing this tape on a cold, wet and windy day in London with heavy black clouds scudding across the bleakest of skies I couldn't help turning my mind towards the warmer pleasures of the Pacific. There's more than a hint of exotic perfume drifting around this album. There's a touch of sun and a glimpse of blue waters and hot, white sand.

The ingredients for the magic spell are: *Bird of paradise*, *On a little bamboo bridge*, *In the wee small hours of the morning*, *Pacific blues*, *Into the blue*, *Here is happiness*, *Patu patu ake*, *Trade winds*, *Lovely hula hands*, *Girl Friday*, *Kontiki march* and *San Antonio Bay*.

Listening once again I really must comment on the outstandingly good recorded quality. In spite of the slow speed we have the lowest of background noise levels and a delightful presence in the instrumental sound that truly does transport one to Islands of Happiness. Escapism? Perhaps. But it's good to know that there are places where the sun shines, the guitars play and life can still be expressed in music. Or so one would like to think . . .

Strongly recommended.

3¾ ips MONO

SCHUBERT. Symphony No. 5 in B Flat Major, D 485 and Symphony No. 8 in B Minor, D 759 (Unfinished). The Philharmonia Orchestra conducted by Otto Klemperer. EMI Columbia TA-33CX 1870 3¾ ips half-track mono. 47s. 4d. including purchase tax.

There can be few who have not heard and enjoyed listening to the Schubert *Eighth Symphony*, the famous "Unfinished." In the opening bars the composer reveals himself as "the great song writer." The work could be described as "original" in the truest sense of the word. It gives us new, delicate effects and orchestral combinations that had never before been heard, a fact which makes it all the more sad to think that Schubert himself never heard it played. First performed in Vienna in 1865 it was heard by British audiences two years later at a concert in the then dazzling splendour of the Crystal Palace.

The *Fifth*, written in 1816, was also performed at the Crystal Palace in London. Scored for a small orchestra it is sometimes called "the symphony without drums or trumpets." Within it can be detected the influence of Mozart.

Recorded quality in this album is not above average, and mention must be made of the occasional obtrusive drop-outs that could be heard in the review copy. The exquisitely beautiful melodies of the *Fifth* should surge forward to the listener, but somehow this doesn't quite happen. So on the whole I was a little disappointed.

NEW PRODUCTS

RECORDER AND REVERB UNIT

WHAT IS claimed to be the "fastest auto reverse" is featured on a new stereo tape deck from Pioneer, the T-600. It is suggested that by cutting the automatic reverse to an interval as short as half-a-second the effective length of a tape can be virtually doubled so that the longest works could be recorded without a break. The system, which uses sensing foil, cuts out when the function control is set to Fast Wind, but it can also be used manually in the Run function.



A number of other major and minor innovations are included in this new tape deck. A new kind of pinch wheel mechanism has been developed so that pressure pads can be dispensed with. The device swings the pinch wheel into position only when the function control is set to Play, and it automatically maintains optimum pressure by means of a special centering mechanism. This is said to ensure correct tension regardless of tape thickness.

One-hand reel loading is another claim for the Pioneer T-600. Two meters are provided (one for each channel), individual channel recording and playback level controls, a choice of automatic playback level by using the appropriate outputs, a straight-line function lever with safety lock, automatic breaking, hysteresis synchronous motor unaffected by line voltage fluctuations, counter, headphone jack etc. etc. The deck may be used either vertically or horizontally, it takes spools up to 7-inches in diameter and runs at 7½ and 3¾ ips.

Wow and flutter is claimed to be less than 0.12% at 7½ ips and frequency response is given as 30 to 20,000 Hz. at that speed with signal-to-noise ratio of 50 dB. Recommended retail price of the Pioneer T-600 is £183.8s.3d. including purchase tax.

Also from Pioneer is a sophisticated reverberation amplifier designed for recording enthusiasts. It makes possible the addition of controlled reverberation effects to recordings that are acoustically too dry or dead. It employs a "double scatter" system involving the blending of two channels into a composite sound; the direct signals that have been fed through the pre-amplifier and the reverberation



signals (consisting of the signals of the opposite channels to which reverberation effects have been added) are merged into an integral sound including what are described as "echoes" and "reflected" sounds.

The system employs two time delay circuits to eliminate peaks or dips in reverberation, so giving stability and balance to the output. It can be used with recordings or with live broadcasts. The unit can be coupled with the usual hi-fi amplifier through the tape monitor jacks in various ways so as to produce reverberation effects just through the speakers, through the recorded sound or both.

At the front of the unit there is an "electronic indicator window" over the full length of the front panel to give the operator a visual indication of the amount of reverberation. Free of purchase tax the reverberation amplifier costs £45.9s.11d.

Shiro (UK) Ltd., Lynwood House, 24/32 Kilburn High Road, London, N.W.6.

TWO HOURS PLAY ON SCOTCH C-120 COMPACT CASSETTE

THE RANGE of Scotch magnetic tape cassettes has been expanded to include a two-hour version. Called the Scotch C-120 it features an improved "shim" material which is claimed to offer reliability whilst eliminating tape binding and jamming, previously said to be a problem with ultra-thin tape in cassettes. Another claimed advantage of the new shim material is reduced frictional drag which has the effect of increasing recorder battery life.



The Scotch C-120 cassette retails at a recommended price of 33s.6d. and it utilises Scotch Dynarange low-noise tape to provide good high-frequency response and compatibility with slow speed recording. As with other cassettes in the range, C-60 and C-90, the new cassette is supplied in a durable hinged plastic case designed to protect the tape and afford easy storage.

3M Co., 3M House, Wigmore Street, London, W.I.

STAND AND BOOM ARM FROM RESLO

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Reslosound Ltd., Romford, Essex.

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RATIONALISATION in prices has been achieved by BASF through the streamlining of their catalogue of costs of audio tape products. In effect it means that in the future all types of BASF magnetic tape, i.e., standard play, long play, double play and triple play will have precisely the same price structure related directly to length.

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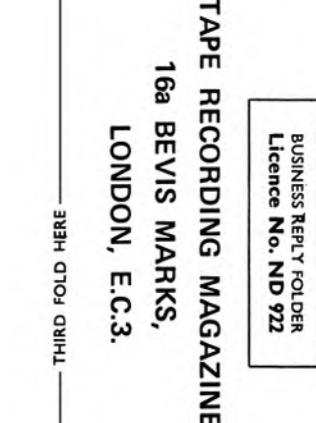
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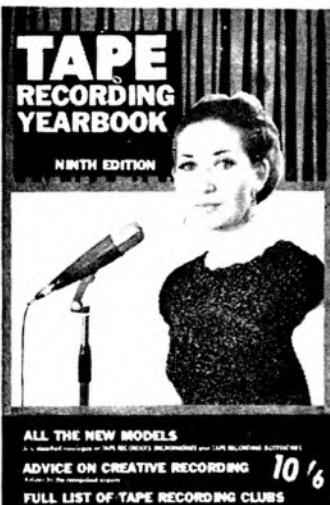
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