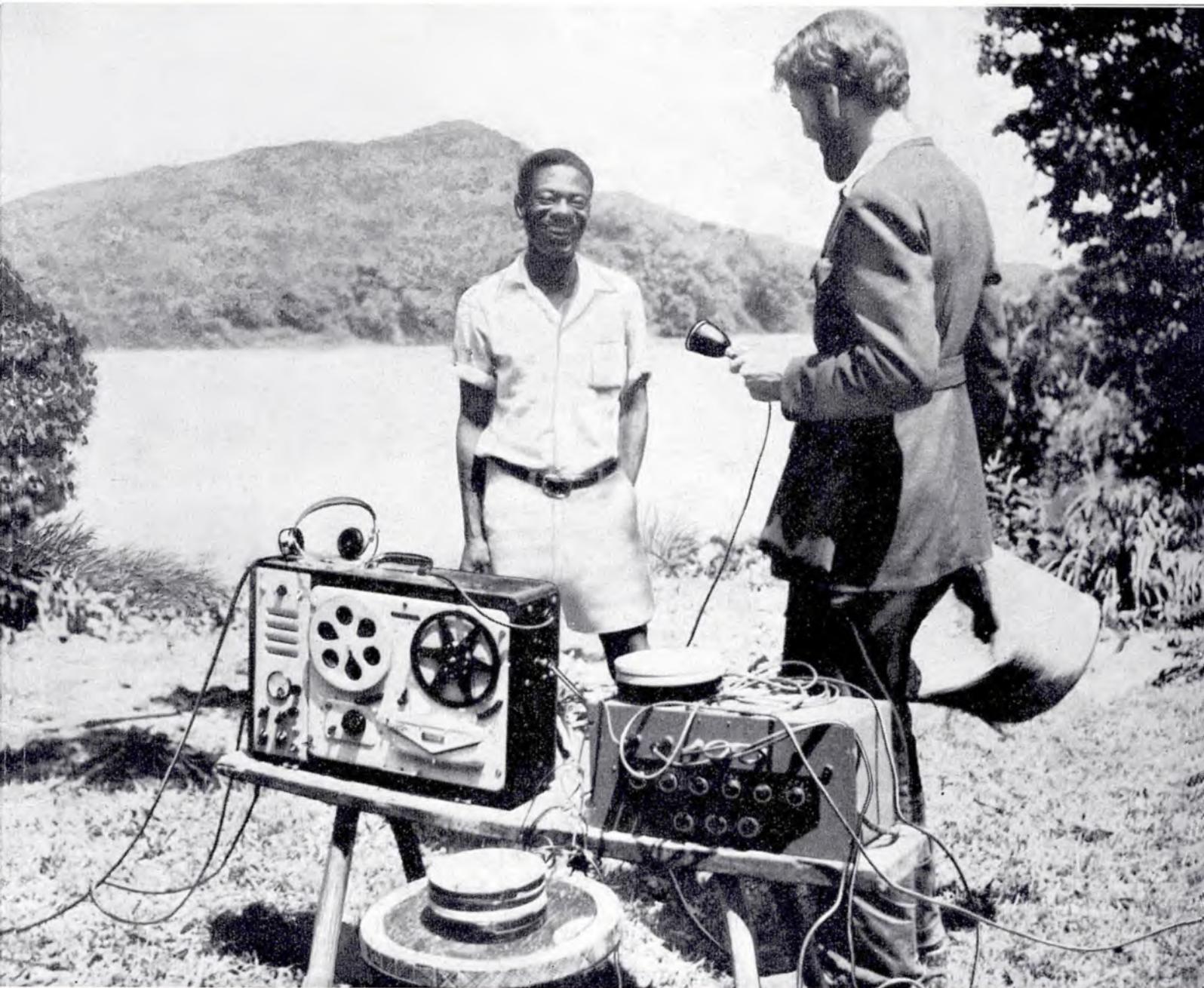


# the TAPE RECORDER

PRICE 1/6

JULY 1959

Vol. 1 No. 6



## IN THIS NUMBER

- Tape Recorder Workbench – Running from Batteries
- This is Copyright
- The Art of Tape Editing
- Beginners' Feature—Taking Up Tape
- Tape and Home Movies
- Readers' Problems
- Tape Decks analysed—the Wearite Series 4
- Recording Nature's Sounds
- Notes and News from the Tape Clubs

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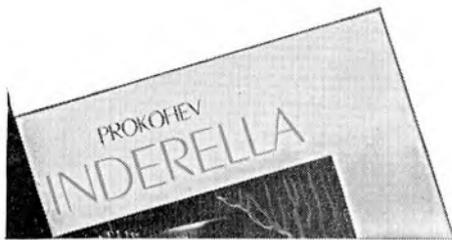
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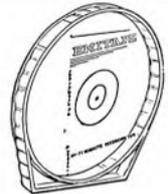
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★  
**EDITORIAL**

LAST Month in this column we raised the subject of the current Copyright strife. We mentioned that we thought it most imprudent to attempt any quick analysis of the position, and we announced the first of a series of articles by well informed writers. This article will be found on page 249.

If we go back a few years, to the days before Edison set his cylinders spinning, and certainly long before the first broadcasting aerials did the same to the æther, we arrive at the point where the song writer received payment for his "hit" in a very simple way, as a result of *copies sold*. Royalty payments became comparatively easy to collect and pay out when phonographic recordings were made. No one had any serious cause for complaint when Copyright music was broadcast; because a perfectly good system for payment of dues was worked out; and the performances of works, recorded or otherwise, were likewise noted down on straightforward forms, and the information was passed on to the Performing Rights Society at regular intervals. And in due course the right person received the correct dues.

Now, moving forward to the present, and with the previous picture well in mind, we find ourselves on the threshold of an apparently impossible position. The man who writes the hit is worthy of his hire. The man who sings it, or the band which plays it (to say nothing of the arranger who has had more than a hand in it all), has to live. The company which makes the recording of the handiwork of all the foregoing, and which spends on average two or three hundred pounds per recording, before even the first discs see the light of day, most certainly needs a fair return for its outlay. Normally, it gets it through the sale of its discs.

In the homes of the hundreds of thousands, however, are the potential wreckers of all this intricately worked out machinery—tape recorders. And tomorrow, or the day after, figuratively speaking, another nought, or two noughts, will be added to the total of "home recorders." And where are we? Do the record manufacturers press half a dozen discs . . . send them out, free and with compliments, to the broadcasting studios? For this, *in extremis*, is what we are heading for; and it is no good wearing blinkers.

No! And there is, on the face of it, only one clear line of action. Circumventing all the present verbiage, all the future scares and litigation, all the uncertainty, we must surely face up to the fact that a new medium for Home Entertainment has arrived, and that a completely new approach is necessary when thinking of Copyright and what it stands for . . . collection of Royalties.

Just as the owner of a radio set pays (or should pay!) a modest annual fee of a few shillings, for which he can have access to tens of thousands of pounds worth of home entertainment, so should the owner of this New Medium also be ready and willing to pay for the facilities that he acquires when he buys it. Ten bob per annum to use a tape recorder, plus sixpence Copyright Stamp on every spool of tape would be very good value to every enthusiast. It would keep him clear of all Copyright wrangles, and it would create a fund from which everyone concerned could benefit, *pro rata*.

Recorders are bought for recording; and people will record what they fancy. No one can stop them. Therefore, make it easy, and everyone will respond.

CONTENTS

	Page
The Art of Tape Editing	
(4) The Final Polish	
By Maurice Brown ... ..	241
News Page ... ..	243
Recording Nature's Sounds	
(3) The Land of the Griffon	
By Eric Simms ... ..	244
Taking Up Tape	
(6) Get to Know Your Microphone	
By Jack Forage ... ..	247
This is Copyright	
By Peter Ford ... ..	249
Club Roundabout	
Notes and News ... ..	252
Readers' Problems ... ..	253
Tape Decks Analysed	
(6) The Wearite Series 4 ... ..	254
Tape Recorder Workbench	
(2) Running from Batteries	
By A. Bartlett Still ... ..	259
Tape and Home Movies	
(3) Magnetic Recording on Film	
By Michael Swan ... ..	261
Adding Monitoring to a Collaro Deck	
By Bernard Driver ... ..	263
Details of New Products ... ..	265
Equipment Review ... ..	267
Our Readers Write ... ..	269
Classified Advertisements ... ..	272
Advertisers' Index ... ..	274

COVER PICTURE

THIS month's cover picture was taken under very different conditions from the cosy flat in Chiswick where our June cover was photographed. It shows Colin Turnbull recording a conversation piece in the Ituri Forest. This is in the heart of darkest Africa, within a few degrees of the equator, and has the most rigorous tropical conditions in the world. Readers will recognise the well-known Vortexion tape recorder which has the Wearite Deck featured in this month's "Tape Decks Analysed", and will realise that the machine is being run from batteries—the subject of our "Workbench" feature.

NEXT MONTH

PROSPECTIVE entrants for our £300 "New Music" Competition will be specially interested in the helpful article by one of the panel of judges, Tristram Cary. He has words of particular encouragement for the "one machine" enthusiast. *Tape Recorder Workbench* will be devoted to the correct maintenance of your machine, and Cine addicts will find notes on new equipment in the *Tape and Home Movies* feature. Another batch of *Readers' Problems* will be sorted out and there will be another instalment for beginners in *Taking Up Tape*.

Also included are all the regular items, *News Page*, *Club Roundabout*, *Cartoons*, *Details of New Products*, and *Equipment Reviews*, and Eric Simms contributes Part 4 of his series on *Natural History Recording*, entitled "Songs of Provence".

SUBSCRIPTION RATES

The subscription rate to *The Tape Recorder* is 21/- per annum (U.S.A. \$3.00) from The Tape Recorder, 99 Mortimer Street, London, W.1. Subscription+Index, 24/- (U.S.A. \$3.25).

By Maurice Brown

# The Art of Tape Editing

## (4) The Final Polish

**T**HIS is my last article about tape editing and in it I am going to deal with the most entertaining part of producing a tape-recorded entertainment, *personal editing*, the final spit and polish which makes or breaks a production.

As I wrote in my first article, I am very lucky; I do not do my own editing, it is done for me by skilled technicians. Let me illustrate how good they can be. I was putting together one of the Gandhi programmes. The sound-track—all the inserts edited and in order with white “leader” tape between each—was running on one machine, the narrator spoke when a “leader” came up, the next insert was played—“leader”—narrator—insert—“leader”—narrator. The combination of tape inserts and narration was recorded on a second machine. If everything goes well all you have to do when the recording is finished is close or lengthen a few gaps and pauses and the final tape of your programme is ready. Sometimes, of course, the narrator fluffs; you let both tapes go on running if the mistake can be edited afterwards or you stop and start the speech again.

In this case Francis Watson, who was narrating, was getting a little tired and he recorded the word “messengers” when he should have read “messages.” A quick look at the script showed that an easy cut could remove his mistake and not change the sense, so I did not ask him to repeat the passage. Late in the evening, while the engineers and I were still at work on the tapes, we came to this error.

“You can cut this,” I said, pointing to the sentence, “it still makes sense.”

“Just a moment,” he said; and he listened carefully, cut out half an inch of tape and fastened the ends together . . . “Now let’s see.”

“Messages,” said the loud-speaker. The ‘e’ sound was near enough to an ‘a’, he had taken out the ‘n’ and the final ‘ers’ was in no way noticeable.

Now, after a few years of working with tape, I expect that kind of artistry and my demands are sky-high when we undertake a “*personal*” editing session together.

### Why Do We Edit?

What are we trying to do? I think the answer to that question is this: to remove distractions but preserve the character of our speakers. All of us, I believe, when we first left disc recording behind and started work on tape, were so fascinated by the ease with which we could remove “ers” and coughs, groans and splutters, hesitations and pauses, that we over-edited to such an extent that we removed half the character of our victims. Most of us, I hope, have now seen that we were wrong, that an “er,” for instance, can be useful and help us make a point.

The other day I was editing the tape of a speaker who was talking about Field Marshall Smuts. He said “. . . Smuts could in debate or in a general election also, rather *er* hedge *er* round the facts . . . Now, these “ers” were the only two in his whole recording but I only took out the second. I think the reason is obvious. Smuts was a friend and my speaker did not wish to use too harsh a word about him, his first “er” was a pause for thought and leaving it in gave strength to his



One of the B.B.C.'s Editing suites in which Maurice Brown has carried out much of the work described in these articles. The engineer on the right is I. W. Jarman, one of our earlier contributors.

statement. But “ers” are infectious and the second “er” was quite uncharacteristic, so I cut it.

Some speakers start nervously and slowly, their speech being peppered with hesitations, nervous laughs and “ers” by the earful. They then get sure of themselves and even speak too fast to make the impact you want or to fit in smoothly with other speakers. By judicious cutting you can speed up the early part of the recording where this is dramatically required by cutting out unwanted interruptions, or slow him up, when this is wanted, by cutting in some of those same pauses and “ers” that you have removed from his slow beginning and kept for this very purpose. But, and I cannot repeat this too often, do not so tidy up your speaker that he ceases to be a personality. By the time you have recorded him, listened to the tape, read the transcript, copied and made rough cuts, you should know how he talks. If he hesitates naturally, let him hesitate within reason and if he repeats words to stress them, as a habit, let him do so. Indeed the late Lord Templewood did this so often and to such effect that while editing a tape of his during the Gandhi programmes I introduced a repeat he had *not* made to give his statement more strength. The final version of “a most remarkable man, most remarkable,” was far nearer to genuine Templewood than was his untypical recording “a most remarkable man.” Such alterations are, I believe, perfectly legitimate.

### Introducing Pauses

I mentioned a paragraph ago that excessive pauses and other troubles may well be reintroduced to slow up a speaker. This means a small store of such short lengths of tape. There are a good many other words or sounds that can be usefully kept and used where need be. Breaths—they need not belong to the right person—often make the best pause between very closely-cut passages. “Yes” or “no”—the right speaker this time—can be cut in to stress agreement or argument. Very frequently the cut after the last extract and that before the first word of the next have to be so made that on joining the tape they become almost one. To make the space between the two words a natural one, I think it’s essential that the pause with which you are going to link the words must be found on the same tape, or at worst from a recording made in the same acoustics and with the same background noise if there is one. The use of a piece of tape without any sound on it or with a different background is always stridently noticeable.

These are only a few of my ideas; I hope some of them have been new to you. The extensions and ramifications of the simple principles about which I have been writing during the past few months are many. I will end this series of articles as I started them, by mentioning the obvious fact that we all make mistakes; all have our small or major disasters. We cut and discard irredeemably, we wipe an important passage, we do not spot a mispronunciation. All seems lost. But, take

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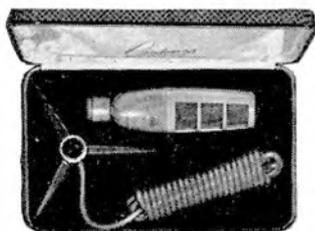
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## THE ART OF TAPE EDITING—(continued)

courage, usually something can be done, even if a little cheating is involved.

A year or two ago two of us produced a programme about the raid on Zeebrugge in 1918. One splendid ex-Petty Officer, a fine dramatic broadcaster, told how after he was wounded, he was taken aboard the *Vindictive* which was lying alongside the Mole, filled with morphia, and naturally passed out. When he became conscious—"There was a hole in the ship's side and I could see a concrete wall and I said, 'Good God, haven't we left the Mole yet?' 'Yes,' somebody said to me, 'We're in Dover Harbour. And the bands were playing.'" Those last five words were magnificent: they exemplified the exaltation that follows the completion of a feat of arms. And we cut them and threw the tape away! It was the old story, we had gone on working too long and reached a state of inefficiency. An adjustment to the beginning of the next insert was made and the five last words of the preceding sentence went with the cut.

I found out the next day when we were adding the narration. Our narrator was a well-known actor and a fine mimic. After about half a dozen shots he got it and the rather husky Bristol voice again said, "And the bands were playing." Nobody noticed it during transmission and until you read this only five people in the world knew of our most rewarding dishonesty.

### One Last Story

And now one last story which concerns correcting a mispronunciation. It was a show with actors, rehearsed for a couple of days and then recorded for future transmission in the Third Programme. The last four lines of the script were a quote from "*The Ancient Mariner*" which started:

*God save thee Ancient Mariner  
From the fiends that plague thee thus.*

During the recording the actor reading these lines pronounced fiends like this—*fee-ends*. He had never done it before and I doubt whether he will ever do it again. I heard it and thought to myself that as there was some editing to do anyway I could correct it later. So I did not re-record the passage.

It looks easy. Take the *fee*, cut out the middle sound leaving the *nds*, and join up. We did it; the loud-speaker said *finds*, with a short *i*. Then I realised that the *ie* in fiend is really a diphthong—a marriage of the two sounds. So we married them. We re-recorded the word at twice the speed (30 inches a second) so that the length of the word on the tape was doubled, cut out both the *i* and the *e* sounds and spliced them into separate tapes. We ran these together on two machines, practicing the mix with the two faders until the diphthong sound was right and then recorded the mixture on a third tape. We then re-recorded the sound at our normal speed (15 inches per second) and cut it in between its *f* and *nds*. To our astonishment it worked and the time taken achieving this small success was one of the most entertaining twenty minutes I have spent editing tape.

### SPECIAL COURSE FOR RECORDING ENTHUSIASTS

The Rose Bruford Training College has announced a second Special Course on Tape Recording, to run from Thursday, August 27th to Tuesday, 1st September. The course is being organised on similar lines to the one successfully held at Easter, and described on page 159 of our May issue.

The first two days will include lectures and practical work on the use of studio equipment and tape editing. For this it is planned to divide the course into groups according to their experience. The programme productions will involve visiting a number of outside locations, including the Radio Show at Earls Court, to make on-the-spot recordings. Once again, our Technical Editor has been invited to contribute to the programme.

An excellent idea is being introduced this time which will encourage students to make the programmes as interesting and technically perfect as possible. These are to be assembled, under the supervision of B.B.C. producer Jack Singleton, into two Programmes for the Blind. The maximum number of members for the course has been set at 50, the inclusive fee is 8 guineas. Full details from: Special Courses Organiser, Rose Bruford Training College, Lamorbey Park, Sidcup, Kent.

# NEWS PAGE



●A shop has recently been opened in Nottingham specialising in the sale of Tape Recorders. Particular attention is being paid to after Sales Service. A full range of tape, and accessories is also stocked. The photograph above shows a corner of the Showroom, which is situated at 11 Burton Street.

### Reflectograph Folder issued by Multimusic Ltd.

A four page folder has been issued by Multimusic Ltd., manufacturers of Reflectograph Tape Recording equipment. The folder contains details of the new Reflectograph Stereacorder, model 570, which will record and reproduce monophonically, stereophonically and two channel.

This equipment which is finished in a transportable two tone case has monitoring facilities on both channels and has lid-fitted loud-speakers. A full specification of the Reflectograph Model 500 single channel recorder is also included in the folder. Available from local dealers or direct from the manufacturers: Messrs. Multimusic Limited, Maylands Avenue, Hemel Hempstead, Herts.

### 3M Appointments

AS a result of the increased sale of "Scotch" Brand Magnetic Tapes and "Scotch" Brand Electrical Tapes Management changes are announced within the Tape and Electrical Products Division of the 3M Company. Mr. D. C. Cable has been promoted to General Sales Manager of a separate Group within the Division and he is now responsible for the sale of Magnetic and Electrical Products, home trade and export.

Other promotions in this Group just announced by Mr. D. C. Cable are Mr. K. S. Chitty to Product Sales Manager, Magnetic Tapes; Mr. E. J. Lewis as Supervisor, Technical Service, Magnetic Tapes; and Mr. W. Westbrook as Product Supervisor, Electrical Products.

### Free Tape Calculator

SCOTCH BRANCH have produced a most useful playing time calculator which gives the playing time for tape from 200 to 4,800 ft. lengths both single and dual track at  $1\frac{1}{2}$  to 15 i/s. This calculator is attractive in appearance and easy to use, the size is only  $3 \times 5$  in., so it will slip into the pocket. 3M's have generously offered to give readers of "The Tape Recorder" a calculator on receipt of a stamped addressed envelope at least  $3\frac{1}{2} \times 5\frac{1}{2}$  in. Write to Minnesota Mining & Manufacturing Co., Ltd., 3M House, Wigmore Street, London, W.1.

### Price Reduction

THE Welmec Corporation announce that the price of their new Telefunken 75-15 recorder (described in the May edition) has been reduced, it now costs £54 12s. excluding microphone.

### C.Q. Factory Move

C.Q. AUDIO, LTD., have now completed their move to their new factory at No. 3 Factory, Bush Fair, Tye Green, Harlow, Essex (telephone Harlow 24566) and are once again in full pro-

duction. The move was made partly as their previous factory at Enfield was extensively damaged by fire last February and partly to provide extra space for expansion.

### Simon Sound Record the Association of Surgeons

SIMON SOUND SERVICE were privileged to record the proceedings of the Meeting of the Association of Surgeons held on April 23rd at Queen Mary's Hospital, Roehampton, S.E.15.

"It is understood that this historic occasion was the first time in which this renowned Association has met under these conditions. The proceedings at Roehampton were organised by Mr. Geon Gillis, the famous surgeon."

### Statement from Grundig

GRUNDIG (GREAT BRITAIN), LIMITED, were interested to read of the injunction obtained by the Decca Record Company on Mr. P. E. L. Bailey of the Grundig Recording Centre, recently reported in the national press. Although this report was scrupulously worded to avoid any misapprehension, they nevertheless feel that the title under which Mr. Bailey trades, which incorporates their name, may give rise to the belief that they are in some way interested in his retail business.

Grundig (Great Britain), Limited, would like to point out that they have no financial or other interest in the Grundig Recording Centre other than that existing between a manufacturer and a retail dealer obtaining his goods from a wholesale distributor.

The new E.A.P. Princess (described on page 265) uses the Motek K.10 deck. This deck differs from the previous model both in styling and in that it has a greatly improved frequency response. The Princess is an example of the new trend in British tape recorders of presenting a well built and reliable machine with a pleasing cabinet design.



### Audio Fair Committee

MR. V. G. P. WEAKE, Director of Pamphonic Reproducers Ltd. and Bryan Savage Ltd. has been elected Chairman of the London Audio Fair and the Northern Audio Fair. Mr. Weake was the originator of the idea of Audio Fairs in its present form in this country and was Chairman of these Exhibitions for the first two years.

He announced in an interview that the Committee remains the same and so do the policies of the Company that is to hold two Exhibitions a year and show to the Trade and General Public the best of sound reproduction equipment and accessories.

He stated that he would do the best in his power to give future Audio Fairs even more of an International flavour. Mr. M. Berry is Vice-Chairman, Mr. L. Brooks remains as Secretary and Mr. C. Rex-Hassan continues as Organiser.

# NATURE'S LIBRARY OF SOUND

## PART THREE \_\_\_\_\_ THE LAND OF THE GRIFFON

“SO largely abandoned to nature; nature in wildest *primaeva* garb, untouched by man, untamed and glorious in pristine savagery”. Thus wrote the great naturalist-hunter Abel Chapman of Spain, and it was with this thought in mind that Bob Wade and I drove across the iron-bound bridge above the River Bidassoa into Spain. We had landed two days before at Boulogne with our recording van and had driven through torrential rain across Normandy, Poitou and Gascony. At Irun a uniformed frontier guard, with several days' growth of beard on his face, waved us belligerently into a parking space; here we went through the long formalities to ensure the safe entry of all the recording equipment with which we hoped to capture the sounds of some of the Spanish birds as well as Spanish music.

From the clean and imposing city of San Sebastian, with its wide streets and broad promenades, we began to climb into the Pyrenees; the narrow mountain road was under repair, corners were being sliced away by giant excavators, and a steady flow of reddish viscous mud across the winding track made driving very difficult. Our destination was Valladolid—the ancient capital of Old Castile. From the River Ebro the road climbed into the central plateau of Spain, known as the Meseta, which lies between two and three thousand feet above sea-level. At Pancorbo the road to Valladolid twisted through a jagged mountain pass where eagles and vultures soared in front of the precipices. From Burgos to the west stretched the great basin of old Castile—cut off from westerly winds and Atlantic rains and so desolate according to an old Spanish proverb, that a bird crossing it must necessarily carry its own food for the journey.

### Recording in Valladolid

We arrived in Valladolid—the birthplace of Philip II and the home of Cervantes—on the 1st of May. The heat was now becoming intense, but there was little or no wind and conditions for the recording of birds were excellent. Under the guidance of Carlos Valverde, a taxidermist in Valladolid, we made our way to a stretch of woodland that clung to the banks of the muddy River Pisuerga a few miles from the city. This narrow strip of trees and undergrowth was full of finches and migrant warblers. At the end of two hundred yards of cable I fixed the three-foot-wide parabolic reflector which fed into a tape recorder in the van. Here we recorded serins, Cetti's warblers, Spanish green woodpeckers, hoopoes, distant church bells and the cries of peasants to their oxen!

It was hardly possible for us to work around Valladolid without the news of our strange mission getting around. Soon we were interviewed by a reporter from the local paper—the *Diario Regional*. To him our activities were quite beyond his experience. So fascinated was he that he asked whether it would be possible for him to join us on a recording expedition. “Of course!” I replied, “but it will mean an early start.” “What about half past nine tomorrow morning?” “No! Half past five!” I retorted. “But that is the middle of the night!” He turned out on time the next morning and watched us make a recording of a serin singing in an ash-tree. When I returned to the van I found our reporter friend in a state of great jubilation. “Los pajaros de Castilla cantan para la B.B.C.!” he shouted. Over a pair of headphones in the van he had been listening to the sounds coming from my reflector microphone, and thus he had heard “the birds of Castilla singing to the B.B.C.”

The country around Valladolid provided us with many of the birds that we needed—great spotted cuckoos in the stone-pines, rock-sparrows around the farm outbuildings, short-toed larks above the great grasslands and black kites in the riverside elms. One evening,

after a long day recording in the open air, Carlos Valverde took us to visit some friends of his. He led us through the narrow streets of Valladolid into a patio, and thence down a flight of steps. As I became accustomed to the light I could make out long benches and small round tables made of casks; ancient wine skins lay stacked dusty and grey against the walls, and small groups of men sat drinking from glass porrons—those conical and long-spouted glass vessels for wine that are passed from hand to hand in friendship. This was the most famous Bodega, or wine cellar, in all Valladolid, and here the students of the University sought their recreation and entertainment. Here we recorded their fascinating guitar music and their songs, made freer by the continuous circulation of the porrons.

### In a Benedictine Monastery

But now the time had come for us to move from the dusty plains of Castile to the clear cool freshness of a Benedictine monastery, set high in the Sierras of Central Spain. Founded perhaps before the Moorish invasion it became under St. Dominic in the middle of the eleventh century, one of the most famous religious houses in Christendom. Our journey to it took us along a tortuous track that meandered through passes where great crags and rock buttresses all but shut the sky from view. At about 6,000 feet the road flattened out and began to run alongside a mountain stream. As the sun was just dropping behind a crag, we turned a bend in the road and there before us was the village, lying snugly beside the mighty wall and towers of the Monastery. At the lodge we were warmly greeted and taken to a most comfortable apartment; we were cared for in the full spirit of St. Benedict's own rule: “Let all guests who come to the monastery be entertained like Christ himself, because He will say, ‘I was a stranger and ye took me in’”. We paused to stand for a moment in the cloisters which are among the most beautiful in existence.

The lower cloister, built by St. Dominic about 1070, was supported by an arcade of 137 columns whose capitals were striking in their delicacy and variety. In the centre a fountain played above a pool and two giant cypresses raised their heads far above the upper cloister. Midwife toads rang their fairy bells beside the water and the liquid notes of goldfinches fell like drops of music from the trees. Before passing into the refectory our hands were washed by the slim, ascetic figure of the Abbot. As we ate, silence was preserved by the monks, but from a pulpit in the wall one of them gave readings from the Bible and the early Christian Fathers. The monks were most interested in our recordings of birds and Father Saturio, then in his eighties, was a mine of information. Father Laurentino, who each year puts marking rings on the legs of the young storks born on the bell-tower, was also a great ally and came out several times on field expeditions with us.

### Using a Decoy

The countryside around the Monastery differed in many ways from that of the plains around Valladolid. Along the streams lay narrow strips of water-meadow that were bright with grape-hyacinth, kingcup and cowslip. Myriads of insects' wings made the air vibrant with their hum and often overshadowed the birds themselves. The pine-dotted slopes of the mountains were the haunts of red-legged partridges, green woodpeckers, rollers, crested tits, rock buntings, migrant cuckoos and ortolan buntings. There were also azure-winged magpies with jet-black caps, blue wings and tails, which often made the mountainsides ring with their strident alarm-notes. To obtain recordings of these magnificent birds we used a stuffed eagle owl as a decoy; one brave magpie, with flicking wings and harsh “Krees”, twice

# NATURE'S LIBRARY OF SOUND *cont.*

*This month's photograph was taken in Spain, and it was to record the wild life of that country that Eric Simms and engineer Bob Wade made the exciting journey described on these pages. The bird in the photograph is a Griffon vulture—"toad-like at rest but magnificent in the air"—and it is standing over a dead deer. (Photograph by Eric Hosking.)*



caught the stuffed owl a buffet behind the head, causing one of its eyes to pop right out of the socket.

Of all the attractive and exciting birds around the Monastery it was the griffon vulture, toad-like at rest but magnificent in the air, which left the most abiding memory. There were quite a few of them around the crags and sometimes we saw a dozen or more above the Monastery, circling on broad pinions with a grandeur and majesty hardly matched by any other bird. We drove many miles later to a great colony of these birds in a red cliff above a green-flanked river. Thirty griffons and three Egyptian vultures were circling above the valley and I could see many more griffons sitting on rock pinnacles near the cliff-top. Bob and I began a tedious ascent beneath a blazing sun carrying an eighteen-inch reflector and a small portable tape recorder. At last we stood beneath the rock-face itself which rose a hundred feet or so above us. Hosts of griffons poured out from the holes and crevices: at one time I counted no less than eighty-seven in the air at the same time—one of the most thrilling moments of my life. We spotted two tiny stunted trees growing on a rock ledge which would just about give us the concealment we wanted. After about half an hour we suddenly heard a curious, persistent noise like the rush of a descending rocket which grew louder every moment; then, with a tremendous "whoosh" of air, a griffon swept over our heads and landed on a narrow ledge. The valley now began to resound with the rush of wings, as bird after bird returned to the rock-face or the pinnacles above. We had switched on the recorder so that we might have a permanent reminder of this valley of the griffons.

## The Griffons Captured on Tape

As the afternoon wore on, the heat coming directly from the sun and reflected from the cliff became almost insupportable. The rock ledges were too hot to touch, and our feet began to swell painfully. So far the great griffons had made no sound: our recordings had been solely of the rustle of their wings. Some four hours after the start of our watch, a griffon, which had been soaring for nearly twenty minutes above our head, began to descend. We switched on the recorder as the descent gathered speed. The bird shot over the top of us, shadowing us with his mighty wings, and then landed on the ledge where his mate was sitting; here he was greeted by a short burst of guttural croaks—the sound for which we had been waiting. Those few seconds of recording captured on the tape—the first ever made of this remarkable bird—were sufficient reward for the relentless broiling that we had undergone. As we made our way down into the valley once more, the air became filled with the glorious sound and spectacle of griffons on the wing.

At the Monastery we played back our results to the assembled monks. They were so delighted that we had enabled them to hear our tapes that they suggested we might like to record some of their chants. The chants of this Monastery are perhaps the finest in Spain and we

were now able to bring them to people who otherwise would never have had the chance of hearing them. In the music practice room, with its piano and great relief map showing all the Benedictine Monasteries in the world, we were privileged to record many of the chants of this Abbey.

So far, we had to come to know only northern and central Spain and I was anxious to visit Andalucia, five hundred miles to the south. We drove south through the cistus-covered plain of New Castile, across the desolate expanse of La Mancha and down to the muddy River Gaudalquivir. We moved on through vast olive groves and corn-fields stretching to the horizon, or through low hills where chocolate-coloured cork-oaks, white cistus and golden gorse grew in wild profusion. Hedges of aloe and prickly pear appeared around the tiny, white cottages and the roadsides were bright with pink mallow and lavatera, white asphodel, golden mustard, mauve iris, and blue convolvulus and borage. Bee-eaters added their rainbow brilliance of golden brown, yellow and green. At Sevilla—city of camellias, roses and orange-trees—five black kites were quartering the river and snow-white cattle egrets stalked among the cows.

## Egrets and Castanets

Huelva lies to the west of the Coto Donaña where miles of dried mud, sand and lagoon create a wilderness of desolation and a sanctuary for wild birds. From Palos de la Frontera, where stands the well from which Columbus is reputed to have drawn his water, we turned south-east through tracts of pine and heather. Huge green lizards ran swiftly off the road before us. We made our way through pines, tamarisks and cork-oaks until we came to a long, stagnant lagoon, covered with a forest of reed. A Savi's warbler reeled in grasshopper-like song from an arm of the lagoon and here we made our first recording. Among the reeds, spoonbills, little and cattle egrets, night herons, purple herons and ferruginous ducks were breeding. In a dense clump of low trees I saw one of the great glories of the bird world—a colony of egrets and night herons. The branches were weighed down with stick-built nests and birds, sleeping, fighting, displaying, or arriving and departing.

We had come five hundred miles from Old Castile to the Andalucian shores of the Atlantic, and as the countryside and the birds had changed so had the music. From the slower, more restrained songs of the north we had come to the torrid, high emotions of the southern fiestas—or festivals—with their outbursts of music, dance and song. The blazing sun does not caress the olive trees, the orange groves and the deserts of Andalucia; it blasts and scorches them with relentless rays. This is the country of the castanet, handed by little children as soon as they can grasp a toy, and I have only to listen to the recordings that we brought back to reawaken the atmosphere of town and village. In the festivals of this land of the sun the music, like the orange wine, holds in its passion the essence of Andalucia itself.

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# TAKING UP TAPE

## Part 6: MICROPHONES

IN outlining the different types of microphone last month, we concentrated on their electrical characteristics. For example, the fact that crystal and condenser microphones represent a high impedance explained why you lose output if the cable extends for more than 6 or 10 feet. Also we saw that low impedance microphones such as moving coils and ribbons will operate with a long lead if necessary, but need a step up transformer. Having established that a given microphone "matches" satisfactorily into your recorder, you are ready to set about getting the best results.

### Try Different Distances from the Microphone

You might begin by experimenting with different distances from the microphone. Try reading from a book or magazine, straight at the front of the microphone, and repeat the same passage at 3, 6, 12 and 18 inches away; then move back a foot at a time as far as the room will allow. It is quite a good idea to announce the distance before reading each time, because the usefulness of this trial recording is going to depend on identifying any changes in quality with the appropriate speaking position.

For the first series of recordings, I suggest that you keep the recording gain or volume control fixed at some known setting. If there is no number scale on this knob, you could make an improvised scale by gumming a white label on to the case, and marking off a scale of your own. Otherwise note the position of the knob with a soft pencil.

When you play back your first experimental recording, the most obvious thing that you will notice, of course, is that the speech gets fainter and fainter as the distance was increased. But listen hard, for other more subtle effects should be apparent. Firstly, the very close speech will almost certainly sound harsh and distorted, the harshness will disappear after you moved back to one foot or thereabouts, and is due to overloading of the microphone diaphragm, or the first valve in the recording amplifier, or both. The second effect you should notice is that the reflected or reverberant sound of the room is more and more in evidence the further off you moved. There should, however, be a range of distances—say from 1 foot to 2½ feet where the quality, if not the loudness, is satisfactory.

### Now Keep the Level Right

The next test I would recommend involves reading again at all the distances as before, but with the additional operation of resetting the gain control for each position. To do this properly you need to have a "dummy run" or rehearsal at each distance, while you, or someone else, adjusts the knob until the level indicator readings are just right. For example, if your level indicator is the Magic Eye type, read each time till the setting is found which makes the eye just close. With many machines it will be necessary to record this dummy run to operate the level indicator, but some recorders have a Pre-monitoring facility which permits level tests to be carried out without starting the machine.

If it is necessary to record each trial run, you should slip a small piece of paper under the first turn of tape on the take-up spool each time and run back to it for the final recording. In this way you will finish up with a series of recordings made at different distances from the microphone, but all with the same indicated levels and all following in the correct sequence. Continually starting and stopping and re-winding each time may seem a bit of a nuisance, but it is very useful to become slick in these operations since it can save you a lot of time when you are recording in earnest.

Now that we have produced an experimental recording with the levels equalised, the effects of the distortion and the room

*The S.T. & C. cardioid microphone 4105 has a heart-shaped directivity pattern. In other words it responds to sounds arriving at the front of the diaphragm, but not at the back. Directional microphones like this are particularly useful in poor acoustics, noisy surroundings, or in Public Address work where it is important to avoid feed back from the loudspeakers.*



acoustics can be studied more objectively. I think you will quickly be able to decide what is the closest you dare work with this particular microphone—at least for ordinary speech—to avoid distortion. The distance at which room reverberation produces noticeable "bathroom" quality varies a lot between one room and another. In fact, it is impossible to separate the subject of microphone balance—indoors, at least—from that of acoustics. In a small, heavily furnished room you may detect very little reverberation at 3 feet. On the other hand, large, bare rooms, which may be excellent for recording music, will probably be so "lively" as to blur speech if the microphone distance exceeds about 2 feet.

### Explore Your Room

So far we have been assuming that you have set up the microphone somewhere in the centre of the room. Using a microphone distance that you have now established as giving good results, it is worthwhile exploring the room to try the effect of different positions. This kind of information will be invaluable when you come to recording amateur dramatics where a change in acoustics helps to set the scene. In a room with live acoustics, you can get quite a range of effects by working towards and away from a corner. Facing into the corner gives a relatively dead effect. As a rule, the microphone should never be placed between the direct and reflected sound waves. But this effect may be just what you want on another occasion, so make a mental note of each interesting sound for future use.

The hard reflections from window panes usually have to be avoided, but drawing the curtains will do the trick. If the curtains are fairly heavy, they will damp down reverberation quite noticeably, so giving yet another acoustic variation. If the ambient sound of the room is still bothersome, the real solution is to open the windows wide. Then the sound escapes from the room and there is no reverberation. Your recordings may have a background of bird song, traffic, and perhaps a few aeroplanes, but late at night, when birds and traffic were stopped, the open window technique may give you just the acoustic effect you need.

### Is Your Microphone Directional?

In the recordings discussed so far, all the speech was directed at the front of the microphone. Of course, reflected sound from the walls and so on reach the microphone at all angles, and it is useful to know how your particular microphone behaves in different directions. In any case, you need to know the angular response of your microphone for recording musical ensembles or round table discussions, etc. To find out the directional properties of your microphone, make a series of recordings just as before. This time, you begin speaking towards the front of the microphone, at a distance and volume setting that you have already established gives good results. Then you should repeat the same

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## TAKING UP TAPE—(continued)

passage, moving round the microphone about 45° at a time, keeping the distance the same.

When you play back this recording, I may be sticking my neck out but I would like to bet that—with a few exceptions—you will be surprised to find that there is very little difference between the passages recorded in all the various positions. This means that your microphone is equally sensitive to sounds at all angles. The technical term for this is *omni-directional*, and the diagram representing an omni-directional microphone is a circle. A good analogy is a single vertical wire wireless aerial, which receives radio waves equally from all directions.

Actually, although I have said that there is very little change in response of most microphones when turned through various angles, slight differences do occur. For high fidelity recording these differences may be too serious to ignore. Generally speaking, the high frequencies are attenuated more and more at oblique angles, and this effect is most acute with microphones which are physically large. This effect is shown in fig. 1 where

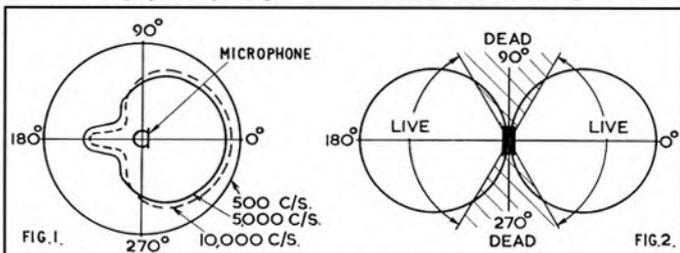


Fig. 1 Showing the tendency with most microphones for high frequencies to be lost, except for sounds arriving on the axis. Fig. 2 Figure-of-eight response of bi-directional ribbon microphones. Speakers or musicians placed in the "dead" angles are much reduced in volume.

the theoretical response curves have been plotted for a spherical microphone at various angles.

### Ribbon Microphones are an Exception

I said a few moments ago that there are a number of exceptions to the rule of microphones being omni-directional. The principal of these is the ribbon microphone. A few omni-directional ribbons do exist, but usually a ribbon microphone is *bi-directional*. That is, it responds to sounds arriving from the front and from the back, but is insensitive to sounds at the sides. The directivity diagram is a figure of eight (See fig 2). If you possess a bi-directional microphone, the test recording just described will quickly reveal the fact because your recording will be loud and clear at 0° and 180°, and will consist only of reflected sound at 90° and 270°. A good analogy to a bi-directional microphone is the frame aerial, such as is fitted in portable radios. This has a good reception to signals arriving in the plane of the aerial and a null at right angles to this. Just as directional aeriels are useful for radio reception in noisy conditions, directional microphones are popular in over-reverberant surroundings since they pick up only a fraction of the reverberant sound compared with an omni-directional microphone. In addition, loud and soft speakers (or musicians) can often be balanced by placing the microphone so that the stronger source is partly on the dead side of the microphone.

Bi-directional microphones are unsuitable for close speech or singing because they tend to emphasise bass frequencies. The effect is shown graphically in fig. 3, and makes ribbon microphones almost unusable at distances less than about 1 foot—(dance band vocalists please note).

### What is a Cardioid?

There is a third basic type of microphone from the point of view of response at different angles. This is the uni-directional microphone, which responds to sounds at the front and sides, but not the back. I mention this type for the sake of completeness. But, though most professional studios include uni-directional microphones, there are very few in use by amateurs. The diagram for this type of microphone is heart-shaped or *cardioid*, and is analogous to the familiar H-type television aerial.

★ Next month: Hints on microphone balance.

# this is COPYRIGHT!

No. 1. WHAT YOU SHOULD KNOW \_\_\_\_\_ By PETER FORD

★ This month, as announced, we bring you the first of a number of articles on the subject of Copyright. The importance of this series need not be emphasised, for it is a most involved subject and its complications are likely to increase rather than become less, as time passes. In future numbers of "The Tape Recorder" we intend to publish authoritative views from responsible authors representing the various bodies most concerned.

TAPE recording enthusiasts and clubs are bound to come up against questions of copyright. But armed with a little knowledge, discretion and commonsense, they need not be haunted by the bogey of an infringement action or fear the wrath of the various bodies which look after the interests of some copyright owners.

Whilst it may be said at once that there are some points of interpretation of the Copyright Act, 1956, which only the Courts can settle, it is possible to explain quite simply what copyright law is all about and to give some rules of thumb for minimising difficulties.

## What Copyright is

Copyright is the exclusive legal right to copy, and hence to allow others to copy, certain kinds of work: both *creative work* (literary, dramatic, musical and artistic) and what one may call *re-creative work*—recordings, broadcasts, films and the typographical layout of books.

It is obvious that many copyrights may co-exist in respect of the same subject matter. Thus you might have the copyright broadcast of a copyright film sound track of a copyright screen play from a copyright translation of a copyright novel in a foreign language accompanied by copyright arrangements of copyright music dubbed in from copyright records! But from a legal point of view the situation is quite straightforward if you take the rights one by one, find out who is the owner, and obtain the necessary licences.

## The Artists' Rights

An artist has no copyright in his performance, but he is protected against having it recorded or broadcast or filmed without his written consent, by the Dramatic and Musical Performers' Protection Act, 1958. This Act is the successor to one with the same title passed in 1925, at a time when many reputable artists were afraid to enter broadcasting studios lest some enterprising, if unscrupulous, manufacturer of gramophone records should record their performances "off the air" at a handsome profit to himself and to the detriment of the artists' own legitimate recording commitments. The Copyright Act, 1956, extended the scope of the 1925 Act to control unauthorised broadcasting and film making. The 1958 Act merely combines the provisions of the 1925 Act with the amendments made in 1956.

It is a criminal offence punishable by a fine "knowingly" to make a record, directly or indirectly from or by means of the performance of a dramatic or musical work without the consent in writing of the performers or to sell, hire out or offer for sale or hire, or publicly to perform a record made without the necessary consent. But it is a defence for the person charged to prove that the record was made "for his private and domestic use only."

The escape clause for the home recordist should be carefully noted. The words "his" and "private and domestic" are limited in scope. "Private and domestic" is more restricted than "private". A meeting of a tape club might be "private" but it would probably not be "domestic".

There are other defences to a charge under the Act, such as to show that a record was made only for the purpose of reporting current events or that the performances in question were included by way of

background or otherwise as incidental to the principal matters comprised or represented in the record.

If you are making a recording where consent is required you can obtain the consent of a group of performers from one person acting on their behalf.

A suitable form of consent might be like this:

"Dramatic and Musical Performers' Protection Act, 1958.

To (name of recordist)

I, (full names) of (full address), hereby consent for the purposes of the above Act, to your recording my performance of (whatever it is) at (wherever it is) on (date).

(Signature and date)."

If it were a group the consent might read, after the heading:

"I, (full names) of (full address) hereby represent that I am authorised to consent and so consent for and on behalf of the persons named below, for the purposes of the above Act, to your recording their performance of ..... at ..... on .....

Names of performers  
(list them)

(Signature and date)."

A note of this kind is not an agreement, so it does not need a 6d. stamp.

## Recording Broadcasts

If you want to record a broadcast otherwise than for your private and domestic use only you will need the written consent of any dramatic or musical performers. You will also need the copyright licence of the broadcasting authority and of the owners of copyright programme material.

Unless the author or composer of the programme material died more than 50 years ago and the material was first published in his lifetime or more than 50 years ago you should assume that it is copyright. Remember that what you are intending to record may be a modern copyright translation or musical arrangement of an original work which is itself old enough to be free of copyright.

If you are recording a broadcast "for private purposes" (note that the Copyright Act does not require them to be "domestic" also) you are not required to have the licence of the broadcasting authority. "Private purposes" means purposes other than recording for sale or hiring, broadcasting or public performance. Whether a performance at a tape club meeting is public will depend on the circumstances. Normally I think it would be fairly safe to assume that it will be private. It would certainly be advisable to try to make it a private meeting.

So far as the copyrights in the programme material are concerned there is an exemption in the case of literary dramatic and musical works, which does not apply to recordings, broadcasts or films as such, for "fair dealing".

"No fair dealing with a literary, dramatic or musical work for purposes of research or private study shall constitute an infringement of the copyright in the work."

I think this provision would allow anyone to make a recording of copyright broadcast material for use in private study and I dissent from the categorical statement of the Mechanical-Copyright Protection Society Ltd., quoted in Mr. P. J. Guy's "How to get the best out of your Tape Recorder":

"It is an infringement of copyright to make a recording of copyright musical work or any other copyright material for any purpose whatsoever without the consent of the owner or his agent."

I can find no warrant in the Statute or in the cases for so narrow

# HI FI YEAR BOOK

1959 Edition

IN pace with the rapidly expanding Audio Industry, the 1959 edition of Hi-Fi Year Book is a much larger volume than its three previous editions. The emphasis this year is still on stereo, with tape recording a close second for home entertainment; and the pages of this very comprehensive book reflect these facts with a wealth of new equipment.



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an interpretation. But do not copy or allow others to copy—let alone sell, hire or publicly perform—any private recording of copyright broadcast material.

#### Re-Recording Records

If you want to re-record a commercial recorded tape, gramophone record or phonograph cylinder, whether "off the air" or otherwise, or someone else's private recordings, first consider whether the manufacturer or the owner of the private recording has a copyright in it as a recording. If in doubt always proceed on the assumption that he has, but the copyright in recordings more than 50 years old may well have expired. If copying an old recording be sure to do so from an old copy. There may be a valid copyright in a re-issued copy. Permission to dub copyright commercial records is granted very sparingly for obvious and legitimate reasons, but if you want it you should apply to the manufacturer or to the Mechanical-Copyright Protection Society Ltd., 29 Maddox Street, London, W.1. I must repeat that there is no "fair dealing" clause in respect of recording copyright. I think there ought to be, but that is another matter.

My comments on copyrights in broadcast programme material apply equally to copyrights in recorded programme material.

#### Performing Copyright Material and Records in Public

Performing right licences should be obtained from the copyright owners, if any, of the programme material and also from the owner of the copyright in the recording as such before embarking on public performance.

Disputes with licensing bodies can now be taken to the Performing Right Tribunal, which is set up as an arbitrator and a protection for both sides. It heard its first case quite recently. There is provision in the Copyright Act for "organisations claiming to be representative" of persons requiring licences as well as aggrieved individuals to go to the Tribunal. Anyone—and certainly any organisation—wishing to go to the Tribunal would be well advised to consult a solicitor and not to try to do the job "barrack room lawyer" fashion.

#### Exemptions for Schools

Special exemptions are made for the use of copyright literary, dramatic and musical material and sound recordings, films and television broadcasts in education. These may be quite freely used for instruction and in examinations but the school concert is not exempted and it would seem wise to check the position carefully if anyone other than teachers and pupils is to be present during the making of a recording or is to hear the recording afterwards.

#### Checking Scripts

If you are asked to record scripted material you should satisfy yourself that it is free from defamatory or obscene matter as well as anything which may infringe the literary, dramatic or musical copyrights of others. Note also that commercial records of sound effects are copyright and should not be used without licence.

#### Your Own Copyright

If you make a recording, provided it does not infringe anyone else's copyright, you have a copyright in it. Where someone commissions you to make it and pays for it or agrees to pay for it in money or money's worth, then unless you have agreed otherwise the copyright is his. If you issue copies of your copyright recordings to the public, you must mark the recording or its container "Recording first published 1959" (or whatever the year is). Otherwise you will lose your copyright. "Issue to the public" includes issue to a section of the public, such as the members of a choir or a dramatic society and "issue" means more than "sale". Thus whether you sell or give the copies—or even lend them out—you should mark them.

Unpublished recordings are protected for all time: published recordings for 50 years from the end of the year in which they are first published. But unpublished recordings are so easily published by accident—if copied—that you would be well advised to make them as published if you have any copies made for other people.

#### Recordings Exchanged

Copyright protection is now international. There are few countries—the U.S.S.R. is one—which do not co-operate in giving protection so you would be well advised to be careful about unauthorised copying

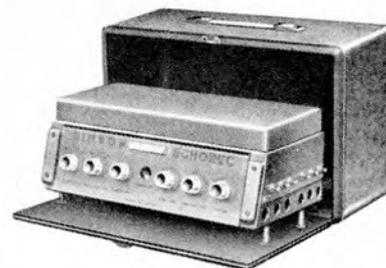
or public performance of material sold, exchanged or given to you by tape enthusiasts or manufacturers abroad.

#### Take Advice

These notes are only a practical outline of the subject and there are some problems which are far from simple. So if you are in any doubt or if you are involved in difficult negotiations with copyright owners or licensing bodies it is well worth taking your problem to a solicitor at an early stage.

If you want copies of the Copyright Act, 1956, the Dramatic and Musical Performers' Protection Act, 1958, and the various Statutory Instruments relating to copyright you can obtain them from H.M. Stationery Office or through any bookseller. If you want to look at any textbooks by far the best is "The Law of Copyright" by W. A. Copinger and F. E. Skone James, Chapters 17 and 18 of which deal with copyright in records and broadcasting respectively. But make sure you have the latest (ninth) edition. A brief account of the history of the subject will be found in my monograph "Copyright in Sound Recordings" published by the British Sound Recording Association in 1957 and obtainable at 1s. 3d. (post free) from the Association at 3 Coombe Gardens, New Malden, Surrey.

★  
THEY SHALL  
HAVE ECHO . . .



★  
The one thing that the "Top Twenty" popular gramophone records always have in common is plenty of "echo". What began as a gimmick has now become a necessity; so much so that recording stars who make personal appearances in variety theatres, dance halls or clubs often sound quite disappointing without the resonating reinforcement of an echo chamber.

Now with the aid of the Binson Echorec shown in our photograph crooners, guitar players, and even whole orchestras can have echo wherever they go. The device is extremely portable, measuring some 16½ × 11 × 8 inches, and weighing 28 lb. It will operate with up to three microphones or other inputs, and may be fed into the main Public Address system or to a tape recorder.

The basic idea of the Echorec is simple enough, and is an adaptation of a type of artificial reverberation machine used in some professional studios. It consists of a magnetic recorder—a rotating magnetic disc instead of a thin tape—with an erase head, a recording head, and four playback heads. To get straightforward repetitions of sounds, or "echoes", the microphone or other signal is fed to the recording head, recorded on the disc, and reproduced a fraction of a second later by one or more of the playback heads. It is possible to select several combinations of these heads to get a variety of effects of the sort often heard on gramophone records.

Another possibility, which is perhaps less "gimmicky", is the effect of controlled reverberation or "swell". Sounds from the microphone can be prolonged more or less at will by feeding part of the output from the four playback heads back into the recording head to be reproduced over and over again. This simulates a full-scale echo chamber, and is the effect most likely to prove popular with purchasers. An additional refinement is a foot-operated control, so that the artiste can switch the echo on or off. Alternatively, a switch may be fitted on the microphone, for example to make announcements without echo.

Amongst the artistes who have used an Echorec in their stage appearances are the well-known vocal trio "The Mudlarks". The device is a Continental importation and distributed in the United Kingdom by Modern Electrics Ltd., 164 Charing Cross Road, London, W.C.2. The price is approximately £160 complete.

## CLUB ROUNDABOUT

● **Bournemouth Amateur Tape Recording Club.** At their last meeting a demonstration was held of the Fi-Cord, Telefunken and Elizabethan Bandbox Recorders. There was also an effects tape of various sounds ranging from a thunderstorm, railway journey, alligators, and monkeys to jet flights, etc., and this proved most interesting, especially the last effect of positive feed-back, which gives a continuous echo effect. The members are to try this out for themselves at a later date. Mr. W. Rawlins won the Competition "Sound Picture". Membership is now fourteen.

They are planning several visits to places of interest, including Southern Television and B.B.C. Studios, and they have already enjoyed a conducted tour of the local Newspaper Presses.

A Hospital service is being organised by the Club, and they hope to start this within the next few days, co-operation from all other Clubs will be welcomed.

For further details, please contact Mr. H. R. Jones, Hon. Secretary, 442 Poole Road, Branksome, Poole.

● **Catford.** Membership of the club has now risen to fifteen. The club display at the Lewisham Hobbies and Handicrafts Exhibition was a great success, and having a tape recorder on the stand to record visitors' voices proved very entertaining for both visitors and interviewers. The Secretary would be very grateful for advice on how to start and operate a Hospital Service. Please write to Derek C. Harker, Hon. Secretary, Catford Tape Recording Club, 62, Barmeston Road, Catford, S.E.6.

● **Coventry.** At the meeting held on the 14th May five new members and two prospective members were present. The main part of the evening was taken up with the initial stages of producing a play on tape "The Permanent Way", but quite a few more characters are required when the play is ready for full production and members interested, who were not present at that meeting, are asked to contact Ted Bright.

The intended visit to the M.S.S. Studios in London on June 6th, has been postponed.

For further information, please contact Mr. Roy Reynolds, 1 Thurlstone Road, Radford, Coventry.

● **Crawley.** Their second meeting was held on the 4th of May, at Southgate Community Hut, Crawley, and four new members enrolled. Mr. Wales won the competition for the most original tape. Messrs. Walter's Instruments gave a display of equipment and accessories.

At their next meeting, on the 1st of June, Mr. Runki, who is a Research Physicist and specialises in Classical Music, will give a demonstration on Editing and Splicing. There will also be a New Competition for Synthetic Sound, and a Members Tape Feature.

● **Jarrow.** At their inaugural meeting Mr. W. Troupe was elected Chairman, and Mr. John Rippington, Secretary. Owing to the noise, the Club premises have been moved to the Central School, Jarrow, and future meetings will be held every fortnight at 7.30 p.m.—June 4th and 17th. The membership now stands at 15, and they hope this will rise to 30. The membership fee is £1 (payable in 4 quarterly subscriptions—in advance).

A fixed programme has not yet been decided upon, as during the light nights the emphasis is all on outdoor activity, but a firm plan will be arranged later.

All applications for membership should be made direct to J. Rippington, 30 Breamish Street, Jarrow, Co. Durham.

● **Kettering.** On Wednesday, May 13th, Mr. J. S. G. Potter, Chairman, demonstrated his new "Telefunken" tape recorder and presented a recorded talk which included recordings he has made over the past ten years.

The Club Members are now at work taking down location recordings for a documentary type programme which they are producing, to be called "The Life of Kettering" or a similar sort of title.

Mr. Dennis Scotney used a very interesting "sound effect" during his "Quiz Programme" which featured the sound made by an arrow being fired from a bow and striking its target.

● **Reading.** The Reading Ciné and Tape Recording Society has now opened its doors to Tape Recording members, which has already increased the membership, and it is hoped that more

# TAPE CLUBS

## Notes and News

enthusiasts will join in the session commencing September 7th.

A tape recording was made of an auction of members' unwanted equipment, after the A.G.M., which, thanks to the highly original patter of the "autioneer", will prove an amusing source of entertainment for the future. The Society welcomes anyone interested in Ciné or Tape.

For information, write to Miss Mary E. Widdows, Hon. Publicity Officer, The Reading Ciné and Tape Recording Society, Ripplesmore Cottage, Easthampstead Road, Wokingham, Berkshire.

● **Rugby.** The main item at the meeting held on May 14th was a demonstration by Mr. Parrington of Walter Instruments Ltd., Members were able to inspect the working of these machines and also to see accessories such as the Stroboscope and the telephone attachments, microphones, etc.

The A.G.M. will be held on Thursday, 4th June, at the Gatehouse North Street, Rugby. On June 18th there will be a Social evening at the Red Lion, Sheep Street, Rugby.

● **Voicepondence Club.** The Secretaries of any interested Tape Clubs are invited to obtain a copy of a 3 inch tape D.T. giving details of the V/S Club, and its activities. 3 inch Reel and return postage to, English Special Deputy, 15 Fentons Avenue, Plaistow, London, E.13.

● **Warwick.** A welcome was extended to Mr. Harley and his wife, the creators of "Dialogue for Cats" when he gave a most enlightening talk on general tape topics and, of course, the forthcoming British Tape Competition. This meeting was the last to be held at the "Black Horse Inn", Warwick, as the club is moving to the Town Hall in Leamington Spa.

One of the main activities of the Society for the future will be a library into which members are subscribing three inch tapes dealing with their other hobbies and interests. These tapes will, then be loaned out to the members who are interested to learn more about their fellowmembers pastimes at a small charge per recording.

Brian Race and Ken Wilkins paid the Audio Fair a visit and came back with interesting accounts of the latest recording machines.

Local enthusiasts who are yet lacking the company of fellow tape fanatics should contact Mr. B. Race, Secretary, of 30 Ashford Road, Whitnash, Leamington Spa, Warwickshire.



# Readers' Problems

★ Do you have any questions on tape recording—technical or otherwise? If so, send them to our Editorial Office and we will find the answer or invite readers to help. But please limit each letter to a single query to help us in answering.

## Jointing Compound for Polyester Tape

From:—J. D. Hone, 10 Aldbourne Road, London, W.12.

Dear Sirs:—I have been using a particular brand of recording tape for some time and now I find that I want to make a "permanent" (welded?) join. The tape is long playing (Scotch Brand 150 Extra Play) tape and normal jointing fluid does not join it.

I wrote to the makers and they replied, saying that their splicing tape was suitable for making permanent joins.

I do not agree and would be very grateful if you or any reader could help me in this matter.

Yours sincerely

The type of tape you are using (Scotch Brand 150 Extra Play) has a polyester base. There are indeed two ways of permanent jointing this tape. The first is the one recommended to you by the manufacturers—to use their No. 41 jointing tape. This produces an extremely durable joint, after hardening, and we feel sure would be eminently suitable for your purpose. However, if you particularly wish to use a jointing fluid, you should obtain the compound specially produced for polyester tapes by MSS Recording Company Ltd.

## Artificial Echoes

From:—REA4 R. G. Tate, PO's Mess, RNAS Yeovilton, Ilchester, Somerset.

Dear Sir:—One often hears on the Radio and also on Records, echoes being brought in to the piece being played; I have always wondered how this is done and I would be grateful if you could give me some ideas on how it could be done so that I can incorporate them on my Tape Recorder.

Yours faithfully

There are a number of different echo effects used on professional recordings and on broadcasts. One or more separate repetitions of sounds, following a fraction of a second after the original, produces a "gimmicky" effect, used on "pop" recordings. The effect on reverberation or drawing out of sounds, which is heard on crooners and most other types of music and in drama productions, requires an echo chamber or a multi-play back system with up to 10 playback heads.

The latter effects are a bit too elaborate to add to an ordinary tape recorder, but a fairly good echo effect can be obtained by connecting a separate playback head and amplifier just after the recording head. Feeding this back into the recording amplifier (mixed with the microphone or other source) means that a series of repetitions will be obtained. The time separation between these echoes depends on the distance between the record and playback heads, and of course the tape speed. You will need a volume control in the lead back to the recording amplifier.

## Erase Cut-out

From:—P. A. Trewartha, 22 Greville Place, London, N.W.6.

Dear Sir:—May I begin by expressing my appreciation of your magazine and, more particularly, of the articles which cater so admirably for the newcomer to tape recording.

And so to my query. Is it possible, with but little technical knowledge and average commonsense, to fit an erase-head cut-out. I have investigated the "innards" of my recorder (a Regentone RT. 50.) and it appears to be a simple matter to fit a switch in the erase circuit. Would this divert the erase current and cause it to interfere with some other function?

I look forward to participating in your forthcoming competition and I feel that I could accomplish much more with the aid of such a switch. I shall appreciate any advice you can offer.

It is true that an ON/OFF switch in the lead to the erase head would have the effect of making the erase facility non-operative when desired. However, a great many people got the same result without resorting to such complicated manoeuvres. Why not experiment with a piece of cardboard held between the tape and the erase head, or a piece of plastic such as a collar stiffener? Other alternative suggestions are to construct

a slip-on cap for the erase head, or design a new route for lacing up the tape so that it does not pass the erase head.

Cutting out erasing is an extremely useful idea. As well as making superimposition possible, which is the first thing we think of, you can cut in the erase current accurately enough to edit odd syllables or noises after a bit of practice.

All good luck to you with our Competition, and we look forward to hearing your recording.

## Home-built Battery Portables

From:—Leslie Walkers, 36 Knowle Road, Maidstone, Kent.

Dear Sir:—I am shortly to go out to West Africa working with Missionaries, recording primitive tribes, to enable Gospel Records to be produced, for later distribution. Not having worked with Tape Recorders previously, I have to catch up fast, and "The Tape Recorder" monthly is going to cut off the corners.

I am a Radio Mechanic, and although I shall be issued with a Nagra, battery transistorized recorder, wish to take out a Battery operated Tape Recorder of my own construction. One in which I know my way about, for instant service, in pretty wild inaccessible places. I am thinking in terms of a tape deck motored by a clockwork spring. This would be quite suitable as recordings are made sentence by sentence, and playback is not longer than 3 mins. 20 secs. Long runs are not required. Is there such a tape deck available?

I do feel all this, and many other of our requirements could be sorted out by contacting an "old hand" in this business. Whatever the difficulties, they will be got over, but I cannot seem to get on the right tracks, just yet.

Yours sincerely

## Battery Portables Again

From:—A. E. Kiley, 45 Ellesmere Street, Poplar, E.14.

Dear Sir:—Would any of your Readers happen to know where I could purchase a circuit diagram of a battery operated Tape Recorder (Transistor or Valve), will do.

The Record and Playback Head I hope to use is a Collaro. Tape Transport being done with a Gramophone motor. Readers please help if you can. I would pay for the loan of a diagram if anyone would be kind enough.

Yours very Hopefully

## The "Sound Master"

From:—H. G. R. Adams, 21 Shelley Close, Highcliffe, Christchurch, Hants.

Dear Sir:—May I, through the good offices of your magazine, make a plea to any experienced tape recordist who has built the "Sound Master" tape recorder. (This, as you probably know, came on the market several years ago as a kit of parts to build a high quality tape recorder.) I should like to correspond with any person (return postage gratefully paid!) with a view to clearing up a few queries which have arisen during building. Unfortunately, the "Sound Master" Advice Bureau has now been discontinued and this has rather left me "in the air" on certain points.

Yours faithfully

## The Hindenburg Disaster

From: J. W. Williams, 10 Nab Wood Road, Shipley, Yorks.

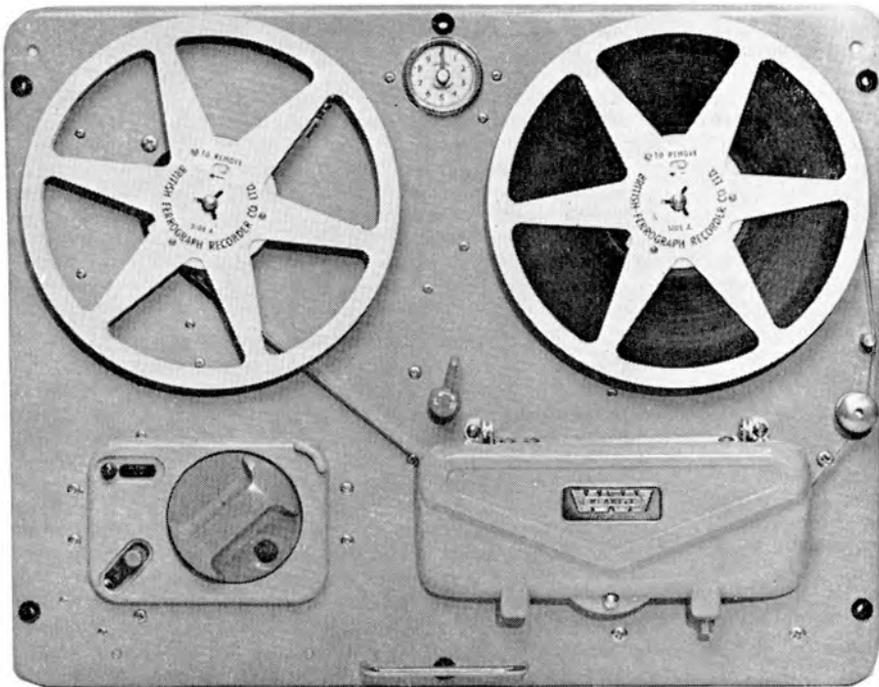
Dear Sir:—In your June edition you kindly published a request from me for a dubbing of the Hindenburg disaster.

I was most agreeably surprised at the camaraderie shown and received not only many offers of help but quite a few recordings (some without sender's name or address). I tried to answer every one and, in fact, have done so until today. The response has been so good that I can no longer keep pace with it. May I say how grateful I am, and if anyone has not had a reply would he accept this instead.

Yours faithfully

**CLASSIFIED ADVERTISEMENTS**  
ADVERTISE WHAT YOU DON'T WANT:  
BUY WHAT YOU DO WANT  
see page 272

# THE “WEARITE” SERIES 4



**Fig. 1:** The general view of the deck shows the new styling of the “Series 4”, including the hinged head cover, the speed change switch (centre) and just visible through the left hand spool, one of the screws for brake adjustment.

TO say that the “Wearite” Deck was the first to appear on the market in the U.K. would be to invite unnecessary argument, though the writer well remembers the Wright and Weaire Stand at the 1947 Radiolympia, when the only other magnetic recorders generally available in this country were the “Sound Mirror” tape recorder, from Thermionic Products and the “Wirek” wire recorder from Boosey & Hawkes. So we shall certainly ruffle no feelings if we say that the “Wearite” is the Daddy of the Decks!

With twelve years or more experience at their elbows, its designers should know quite a few of the answers; and it only needs a quick glance at the latest version to show that they do. It is strongly built, mechanically sound, purposeful in appearance. It also embodies several very useful and unique features.

Basically, the “Series 4” deck is the same as it has been for several years in previous versions. That is to say, there have been no drastic alterations to the tried and tested mechanics. The mechanical changes,



**Fig. 2:** Close-up view of the grouped operating controls. The main function switch has four positions, Record, Wind on, Wind back, and Play. In the Wind positions, the pressure pads are held away from the heads to prevent wear and facilitate tape loading.

which are important improvements, were noted in our first number, and we reprint the paragraphs here:—

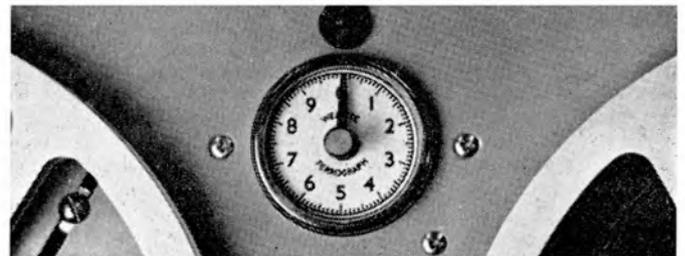
**Mechanical Changes.** (1) The function control—hitherto a large knob, which has proved difficult for some users to turn—has now been replaced by a lever-type knob. (2) The capstan motor is now on a resilient mounting, which makes the unit more silent. (3) The indicator, which used to be belt-driven, is now gear-driven, and gives accuracy to within one turn. (4) The “Brief Stop”, hitherto an extra, becomes a standard feature on all models. (5) The plastic head cover, previously in two pieces, is now in one piece, and hinged to assist easy tape loading.

### Plug-in Heads

Most important of all, however, is the final item. (6) The introduction of plug-in heads. The new “Series 4” instruments are being sent out with heads as ordered, *plus* a dummy head and rocking device (for azimuth adjustment) in the unused position. The user can thus unplug the dummy head and replace it with any other head in the Ferrograph range . . . for monitoring, stereo replay, top or bottom track erase, etc. This plug-in arrangement will also make it possible to adapt the recorder for the new American double track, narrow tape stereo. The well established Ferrograph automatic stop, for tape breaks or end of spool, has been retained by incorporating it with the first (erase) head, thus leaving room under the cover for three heads.

Mechanically, the deck can be broken down into six sections, each independent of the other, as follows:—

*Capstan drive unit.* A double-decker structure of exceptionally



**Fig. 3:** The tape position indicator is gear-driven, and gives a greater degree of accuracy than most types. The knob in the centre allows the indicator to be set back to zero prior to recording or playback.

# THE "WEARITE" SERIES 4 cont.

rugged construction which carries the fan-cooled capstan motor on the lower storey, and the heavy capstan fly-wheel on the upper storey. A stepped drive wheel (two steps) is fitted to the top end of the motor shaft.

*Speed change.* A small lever in the centre of the deck (fig. 1.) operates (a) a wafer switch (3) for C C I R correction network circuitry and a plate (4) with two adjustable cams, which determine which of the two push-links (5—5) shall be operative.

Fig. 7. shows the capstan fly wheel and two rubber idlers which are independently mounted at the extremities of the above two push links.

According to what speed is selected, one or the other takes the drive from the stepped pulley and transmit it by contract with the capstan fly-wheel.

*Spooling motors,* right and left, run completely independently.

### Controls Easy to Operate

*Main Control* (see Fig. 2.) One of the points of criticism of Wearite decks was the "strength of wrist" needed to operate the knob which controls *fast wind, record* and *replay*. This has now been modified and is considerably easier to use, as well as giving a much more direct

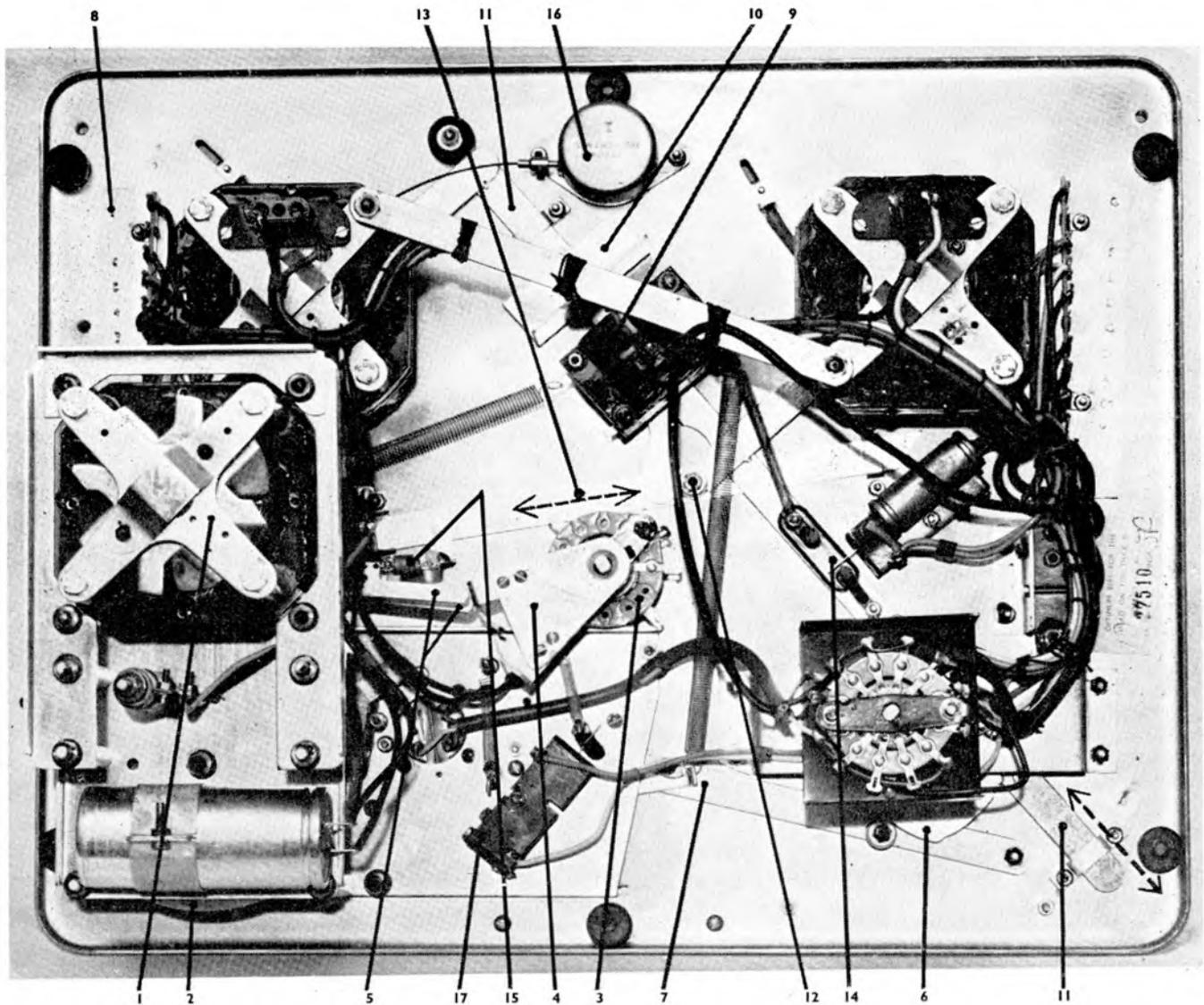
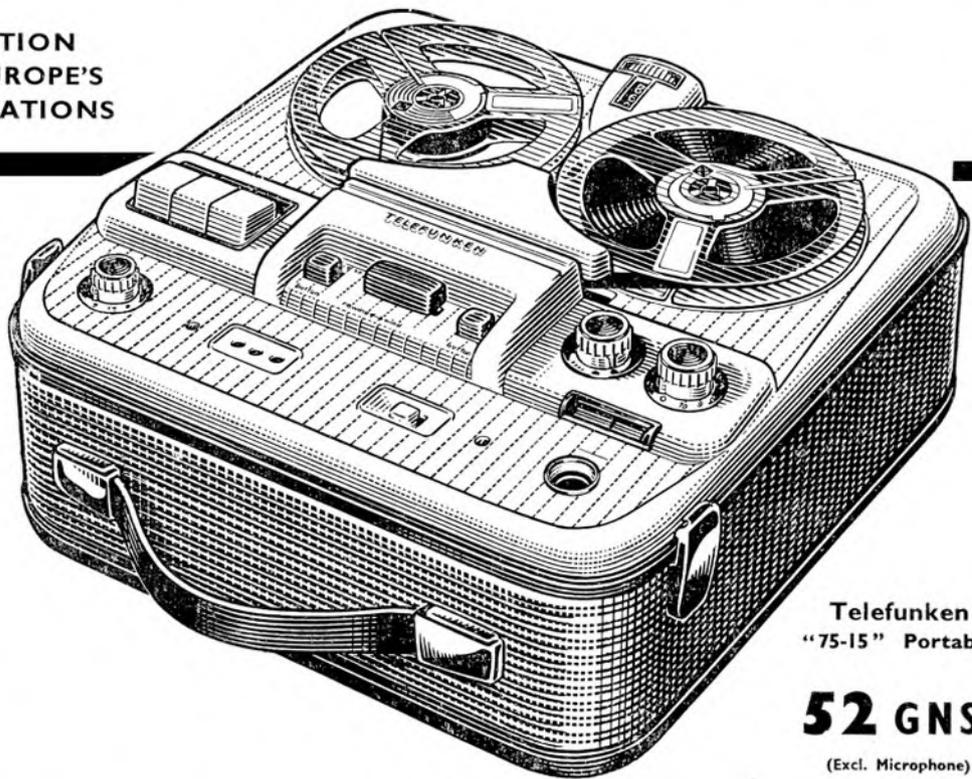


Fig. 4: 1. Drive motor 2. Fly-wheel 3. Wafer switch 4. Speed change plate 5. Push-links for 2 speeds 6. Cam plate for function control 7. Link 8. Tag panel 9. Electro-magnet 10. Contact for solenoid 11. Solenoid-operated link 12. Roller bearing 13. Link for braking 14. Power switch 15. Springs to idler wheels 16. Position indicator 17. Micro-switch.

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SUPPLIERS OF  
 SOUND REPRODUCTION  
 EQUIPMENT TO EUROPE'S  
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The NEW Telefunken  
 '75-15'



Telefunken  
 "75-15" Portable

**52 GNS.**

(Excl. Microphone)

★ NEW 5 $\frac{3}{4}$  in. tape spools give an even longer playing time of over 6 hours using Telefunken DP tape at the slower speed of 1 $\frac{1}{2}$  i.p.s.

★ NEW Special Tone Control allowing for regulation of treble response.

★ NEW Volume and input controls now separated for easier manipulation.

★ NEW Horizontal fluorescent bar recording level indicator.

**And look at this specification !**

Two tape speeds with frequency range: 60-16,000 c.p.s. at 3 $\frac{3}{4}$  i.p.s., 60-9,000 c.p.s. at 1 $\frac{1}{2}$  i.p.s.

Connections for synchronised control of automatic slide projectors. All miniature film sound couplers can be used. Fully automatic press-button controls guarantee simple operation. Twin track to International Standards, Telefunken Recording Heads with dead straight extremely fine gap.

Super sensitive tape tension and control system ensures protection and longer life of recording heads and tapes.

The excellent quality of reproduction well justifies the use of a separate loudspeaker from the extension sockets provided.

Lightweight Styron case (weight 21 lb.).

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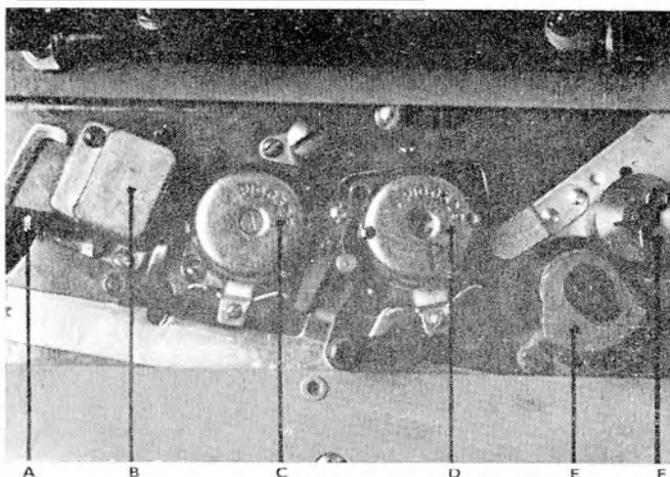


Fig. 5: The head and capstan assembly. (A) Automatic stop finger (B) Dummy head (C) Erase head (D) Record/Playback head (E) Drive capstan (F) Pressure roller.

picture of what is happening. It controls the metal cam plate (6) which in turn controls pinch roller, pressure pads and automatic stop 'finger' by means of the link (7). The shaft of this control also carries a wafer for switching the motor and (through the tag panel 8) electronics.

**Solenoid Control.** This 7th and final unit (9-10) is the key unit which really controls all the others. It is shown in close up in fig. 6, and its operating control can be seen at bottom left of fig. 2. With the control knob described in the previous paragraph the operator selects what he wants—but the deck is only brought into operation by using the "Run" button which is pulled diagonally downwards. Its main and direct action is to slide the link 11 (movement show by arrows) thus bringing the metal plate 10 into magnetic contact with the electro-magnet 9, which holds it there. The arm 10 cannot be moved into the "Run" position unless the main control (selector) knob is exactly in any position, because locking slots on the cam plate (6) are cut so as to refuse it. Finally movement of the link 11 switches on the power through the switch (14).

**How the Brakes are Removed**

As the link 11 slides, a roller bearing (12) transmits a sliding moment to the link (13). This link does two jobs: (a) operates the brake shoes on the two spool motors, and (b) applies tension (through springs 15) to the rods carrying the idler wheels.

A button "Press Stop" (fig. 2.) breaks the power supply to the

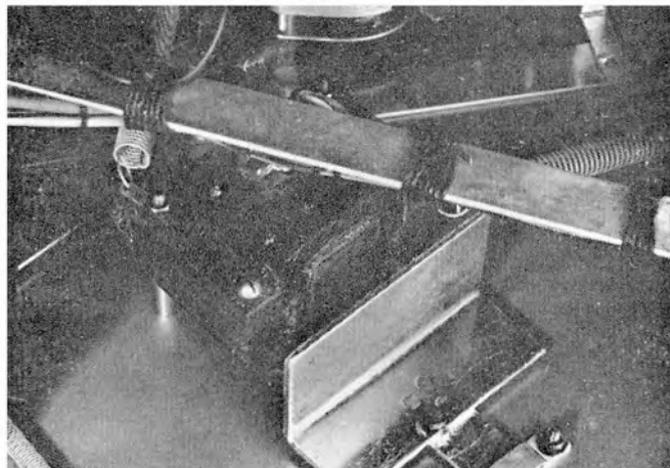


Fig. 6: The solenoid control, showing the electro-magnet (centre) and the metal contact plate. Pulling the "Run" switch to the on position moves the plate against the magnet and pulls the brakes free. This position is held by the solenoid until the current is cut by the operation of either the Manual or Automatic Stop switch.

solenoid (9) and the link (11) flies back, operating the brake and releasing the idler in use.

The clock-type counter deserves a paragraph to itself. It is driven by a flexible drive from a worm on the shaft of the take-up motor.

Fig. 5. shows the layout of the heads and tape drive mechanism. On the left is a "dummy head" which can be replaced as described in the opening paragraph. The finger (A) which replaces the customary pressure pad, is the "automatic stop" feeler. If the tape breaks, or the end of the tape passes it, it moves inward and operates the micro-switch 17 on fig. 4. This instantly breaks the power supply, thus operating the solenoid and applying the brakes etc.

**A Deck for the Serious-minded**

In conclusion, an efficient deck, a well tried deck, and a deck to consider very seriously for serious work. *But*, we warn that the makers (Wright & Weaire Ltd.) do not have great quantities available. Indeed, apart from the very well-known *Vortexion* recorder, the only other instrument employing the deck is the *Ferroglyph*—and that is made by an associated company of Wright & Weaire Ltd. Still, there's no harm in trying!

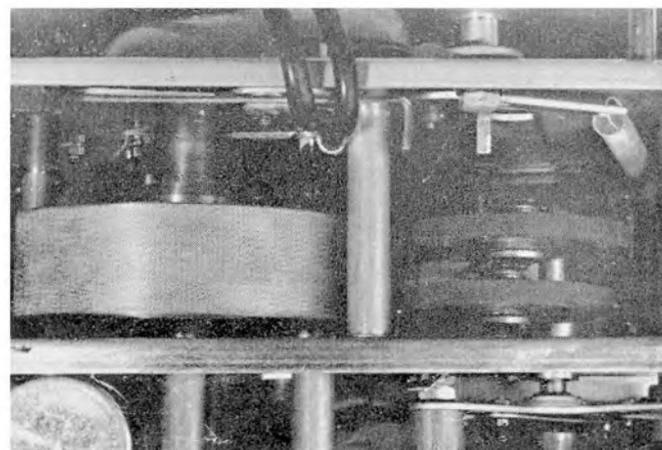


Fig. 7: Side-on view of the drive parts of the mechanism, showing the fly-wheel which is carried on an extension of the capstan spindle. The two rubber idler wheels on the right are lined up with the appropriate sections of the milled capstan of the drive motor (bottom right) and are selected by the Speed-change switch.

**Manufacturer's Specification**

**Mains voltage:** 200-250v, 50 c/s or 110-130v, 60 c/s. **Consumption:** 57 watts. **Tape speeds:** 7½ and 3¾ i/s, or 15 and 7½ i/s. **Three motors.** **Spool sizes:** Up to 8¼ in. **Place indicator:** Gear driven, accurate to 1 turn. **Playing time per track** (1,750 ft. reel): 45 mins at 7½ i/s, 90 mins at 3¾ i/s. **Rewind time (and rapid wind on):** less than one minute. **Frequency response:** 50-12,000 c/s at 7½ i/s; 50-6,000 c/s at 3¾ i/s. **Wow and flutter:** Less than 0.2% at 7½ i/s. **Recommended erase and bias frequency:** 53 Kc/s. **Erasing voltage:** 25/23v. **Erase head impedance:** 350 ohms. **Recording head impedance:** 12,000 ohms at 10,000 c/s. **Solenoid resistance:** 330 ohms. **Solenoid current:** 30-60 milliamps. **Size:** 16½ × 13 × 7 ins. **Weight:** 18 lbs. **Price:** from £36 10s. Manufactured by Wright & Weaire Ltd., 131 Sloane Street, London, S.W.1.

**CALLING ALL AQUARISTS**

We have received a request from Charles G. Adams, 215 Bruntsfield Place, Edinburgh 10, on behalf of the "Edinburgh Aquarists Society".

He says: "We are at present attempting to compile a comprehensive tape library of recorded lectures on Tropical Fish and allied subjects, for the use of Aquarists in Britain.

Our purpose is to contact any persons at home or abroad who, being interested in Tape Recording and Fishkeeping and/or Breeding, might be willing and able to assist us in obtaining or making themselves, recordings of lectures on the subject, by recognised authorities, or very experienced breeders". Anyone interested in the idea should contact him at the above address.

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Telefunken 75/15	5	18 0	4	8 2	56
Brenell 3-Star	6	4 0	4	11 2	58
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## YOUTH CLUB "MAKES A BROADCAST"

● Account of an interesting Youth Club venture sent to us by Islywn Jones, Assistant Youth and Community Officer, Brighton.

YOUTH Clubs are constantly searching for new and progressive ideas, and recently I happened to be in on one which proved very successful. Bernard Gregson, Warden of the Central Boys' Club, Brighton, worked out a week-end residential course entitled "Let's Make a Broadcast." Robert Gunnell, a B.B.C. Producer who was responsible for the Younger Generation series, directed the project with the help of three adults acquainted with the techniques of tape recording.

Twenty boys attended and were divided into groups of four. A course of this nature can easily develop into a "sit down" talking shop. I must say that this one was hectic and exciting. Nine local people in the village of Hassocks were invited to co-operate in this scheme. They included the local doctor, minister, chairman of the Council, a journalist, who incidentally turned out to be the father of Donald Sinden the film actor, the station master, the post mistress, librarian, and a farmer. Armed with tape recorders each group set out to visit the personalities in their homes to get an "on the spot" interview, but not before they had been fully briefed on the technique of interviewing. Operation broadcast was under way.

The group to which I was assigned knocked on the door of the station master's house with fear and trepidation. We soon realised that our fears were groundless as this plump jovial character soon had the boys at ease. (According to the instructions it should have been the other way round) After making certain that the machine was recording, the interview commenced. The questions came spontaneously—"How did you become a station master?", "How many people travel to London daily?", "Will the railway modernisation scheme effect the station?", "What sort of complaints do you get from passengers?", and so on. I wish, too, that we could have recorded the smile of satisfaction on the station master's face when we played back the recording to him.

Leaving the station master the group made their way to the plush office of the Cinema Manager. Again we were welcomed with a friendly atmosphere and question after question was put to the somewhat perplexed manager. "What type of films do your audiences appear to like best?", "Have cinemas changed within the past five years?", "How do you feel about TV?", "What determines the films you show?"

Returning back to the centre the group played back the recordings and with a stopwatch and a critical eye decided what should be transferred to the master tape. The total length of the final tape was agreed at 30 minutes, therefore only five minutes of each interview could be used. It was a fascinating business listening back and deciding what material could be included. This gave rise to controversial discussion and as precious time slipped by other loaded tapes arrived and we learnt more and more about the sleepy village of Hassocks. From the whole course a producer and narrator were elected and a hasty script was prepared. In the presence of the boys, and at their suggestion, Bub Gunnell cut the tape and edited it. With apt and split second timed comments from the narrator, coupled with snippets of recorded mood music, the script was superimposed on to the master tape and the broadcast took shape.

From nine different tapes there emerged a clear and interesting picture of Hassocks, its people, history, characteristics and general life.

Not until the last minute of the course did the assembled company have an opportunity to hear the completed tape. They sat and listened with rapt attention. It was a magnificent achievement. As well as being fun and giving us some technical "Know how", the course did much to recapture the gentle art of conversation. This idea, although needing tremendous organisation, is certainly a worthwhile project for any club.

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# ... tape recorder workbench

Practical suggestions for the tape handyman \_\_\_\_\_ by A. Bartlett Still

ALTHOUGH the summer season may not always bring all that is desired in the way of blue skies and hot sun, we are a hardy race (of necessity?) and the longer daylight hours alone are sufficient to tempt us out-of-doors. The enthusiastic tape recorder owner, eager to find new sounds to tape, and possibly with Eric Simm's words ringing, so to speak, in his ears, will be wishing that his portable machine really justified the term.

While such recorders are certainly available, they come in the expensive luxury class for most of us, and we must therefore remain tied to a mains socket. However, that need not keep us at home, because it is possible to make our own mains out in the open air. In case readers are picturing themselves, or a handy small boy, pedalling furiously on a sort of bicycle with a generator on the back wheel, let me hasten to say that I am referring to a device known as a DC/AC Converter. Briefly this

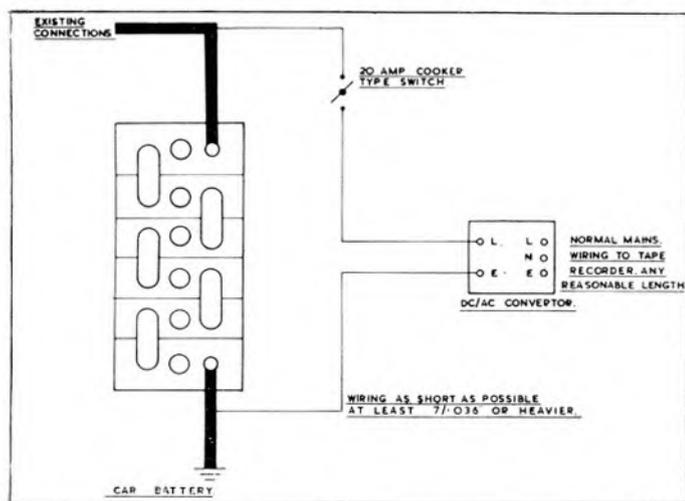


Fig. 1. Showing the connections from the car battery to the DC/AC Converter. It is important to keep this wiring as short as possible, and to use heavy gauge cable.

can take in Direct Current from a suitable battery and turn it into Alternating Current of the type and voltage that you normally use to run your machine.

## Plenty of Power Required

The load taken by a tape recorder from the mains supply is not normally considered to be great, but if that load has to be derived from a battery it becomes quite substantial. A DC/AC Converter cannot give out any more power than it takes in; there is, in fact, a slight loss due to the power required to operate it. Broadly speaking, an average portable tape recorder working, through a converter, from a 12-volt car battery would be equivalent to the side and both headlamps full on, with frequent toots on the horn as well! Just as well that the car engine is available to recharge the battery on the way home, it being assumed that you won't wish to carry your machine, a converter, and a car battery, very far without a car. Lack of the required transport makes the truly portable T.R. a very economic proposition!

## Use Heavy Wire

A suitable converter is quite small and may be fitted permanently in one corner of the boot. There are few connections to be made, to the battery, and to the tape recorder. The battery connections must be in heavy wire (tell your electrical shop "7/036") and preferably P.V.C. covered, as any car oil would attack rubber. A switch should be fitted if there is not one on the converter. The lead to the T.R. should be in ordinary mains cable and can be many yards in length. If it is required to use

## No. 2 . . . . . RUNNING FROM BATTERIES

the machine with the car on the move, it may be found necessary to fit really good suppressors to the engine.

There are generally three types of converter, rotary converters, virtually a DC motor driving an AC alternator, valve converters, normally only available for DC mains use, and vibrator converters, similar to those used on car radios. Most mains type recorders employ synchronous motors, which means, in effect, that the tape speed is dependant on the supply frequency. For this reason the vibratory type of converter is to be preferred as the frequency of the AC Voltage produced can be maintained to limits of about  $\pm 1$  per cent.. The cost of these units ranges from just over £12 to just under £18, depending on the power required, which again depends upon the size of tape recorder.

Messrs. **Vibro-Supply, of 57 Fortess Road, London, N.W.5.**, are specialists in this type of equipment, including the Valradio range, and have a wealth of experience of the operation of tape recorders in this way. **Vortexion, Ltd., of 257/236 The Broadway, Wimbledon, London, S.W.19.**, also make a complete battery unit specially for tape recorders. Any enthusiast who is seriously considering making his equipment more mobile can be sure of helpful advice and the right unit. So let's hope for that blue sky and hot sun after all!

Next month we will make a start on some of the essential maintenance of your machine that can easily be done at home, and that should, in fact, be done regularly if the performance is to be kept on the top line.

\* \* \*

## OUR £300 "NEW MUSIC" COMPETITION

THE complete Schedule of Rules, the list of 5 subjects, and the Entry Coupon were published last month and gave enthusiasts all the information they needed to get down to the fascinating and creative work of preparing their entries.

We have gathered together a very distinguished panel of experts to act as judges of this Competition. Their combined experience ranges over every aspect of "New Music"—the commercial and artistic applications, as well as the technical and musical creation. They are:—

**Daphne Oram**—full time practitioner of electronic composition and *musique concrète* and author of the article on New Music in last month's *Tape Recorder*.

**Tristram Cary**—composer who writes a great deal of incidental music for films, TV and radio. When the production calls for sounds outside the scope of the conventional orchestral instruments, he manufactures the answer on tape in his own studio. He has built most of the electronics himself and has given a number of talks in the BBC programme "Sound" on Network 3. He describes how he creates music on tape, and offers advice for the man with only one machine, in next month's issue of *The Tape Recorder*.

**Eric Tomlinson**—Chief Recording Engineer of the International Broadcasting Company. When not recording standard and stereo L.P. discs, he is active in assembling the sound tracks for radio and TV advertising shorts.

**Desmond Briscoe**—BBC Studio Manager in charge of the Radiophonic Workshop. He has devised and recorded electronic incidental music and effects for every conceivable type of broadcast from science fiction to the Goons.

**John Borwick**—Technical Editor of *Hi-Fi News*, and *The Tape Recorder* and compere of the BBC "Sound" programme.

Readers who missed the entry coupon printed last month can obtain a copy by sending 6d. in stamps to the Editorial Office, *The Tape Recorder*, 99 Mortimer Street, London, W.1.

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By Michael Swan

# TAPE AND HOME MOVIES

● Third in this regular series of articles devoted to tape and cine. This month the author describes a number of synchronising devices.

BY far the best way to add a sound track to a film is to record it direct on to the film. Whilst a synchronised tape recorder, or a mechanically coupled recorder will give excellent results, exact synchronisation depends upon the operator's skill in starting the film and the tape together with synchronising marks. With the introduction of magnetic striping on to the film, and suitable recording and playback equipment, the sound track will play back exactly as recorded every time. Magnetic striping is available for the 8mm. user, and will, no doubt, be used widely in the future. Unfortunately, the magnetic projectors that are available are expensive for their gauge; but more important, there is no standard for the positioning of the magnetic head, with the result that a sound track recorded on one system may not play back as anticipated on another machine. Also, the magnetic stripe on 8mm. films runs very slowly, 16 eight millimeter frames per second is about  $2\frac{1}{2}$  i/s, and as the magnetic stripe is very narrow, the results do not necessarily compare with  $3\frac{1}{4}$  i/s on any good tape recorder.

## 16mm. has many Advantages

The 16mm. film user is far better served by magnetic striping, and he is by now reconciled to the higher cost of the gauge. Sixteen millimeter film is widely used by professional units, and there is a vast library of 16mm. sound films available. There is an internationally agreed position for the sound head. Sixteen millimeter release prints have an optically printed sound track, which cannot be erased. To make a 16mm. optical track is quite a complicated and expensive job. But a 16mm. magnetic track is easier to record, and for the amateur, easier on the purse. Magnetic sound tracks are not used widely pro-



fessionally, because they could be erased. However, they are a boon to the amateur, and give a far superior reproduction to the optical track. It is now possible to have an optical sound track made from a magnetic sound track if a large number of prints are required. The only way to copy a magnetic sound track is to re-record from it.

The magnetic sound track can be an edge track (30 thou wide) on double perforated stock (as normally supplied for the camera) or a half track (50 thou wide) on to an existing sound track, or a full track (100 thou wide) on to single perforated stock. The edge track gives good results at sound speed (24 frames per second) and passable results at silent speed (16 f.p.s.). The half track is only used occasionally by film users who wish to dub another language on to an optical release print.

A 16mm. magnetic optical projector is an optical sound projector with magnetic heads and pre-amplifier added. It will show a silent film, play an optical sound film, and record and playback a magnetically striped film. Of the models available on the market, the Ampro is popular with professionals.

The *B.T.H.* model 451 has many devotees, and I particularly like the built-in mixing facilities. The *Debie* 16mm. magnetic machine is a heavy duty professional job. The *Siemens* projector is popular on the continent.

For the illustrations to this article, we have chosen the G.B. model 640 projector, and now is the time to introduce Bob and Gladys Allen, from Melbourne, Australia. Mr. and Mrs. Allen are on their round-the-world trip, and they are filming their travels in 16mm. colour. Apart from some wonderful films they have an enormous collection of guide and travel books collected en route. Now they are about to record the sound tracks to their films.

## Recording the Sound Track

The first picture (left) shows a typical set-up for recording the sound track to a film. Mrs. Allen is operating the "non-synch" i.e. the twin turntables for the background music, and the output from this is fed to the projector via a mixer unit. Mr. Allen is seated by the microphone, script in hand, ready to deliver the commentary. This rosy picture is, no doubt, how the projector manufacturers imagine their machines will be used for recording. Unfortunately, there are some serious snags to this method of operating. Considerable practice and skill, and good luck, is required to get a perfect recording first time. Two pairs of hands are not always enough to operate all the controls at any one time. And if Mr. Allen should miss a cue, he will have to start all over again. I would not recommend attempting to try this by oneself—I have tried, and I made eight re-recordings before my first film was anywhere near right.



# Truly Portable

Here are three recorders in size and weight truly portable, as easy to carry and use as a camera. Battery powered, they may be used anywhere independent of electric mains supply. Their unobtrusiveness makes them ideal for taping family or public events, or business interviews. Invaluable to add sound to amateur cine films. Recordings may be played on larger recorders. Come to Audio House for demonstration of these remarkable recorders or send for details to-day.

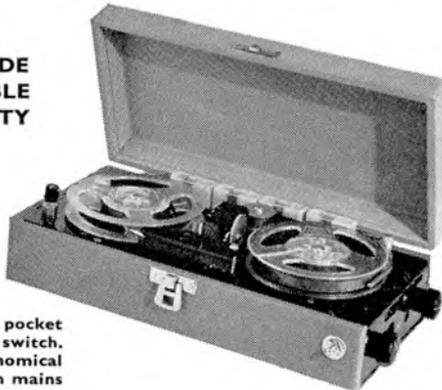
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*This recorder is the one employed by the writer of the article in the June "Tape Recorder", "A Woman Takes Up Tape".*

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## TAPE AND HOME MOVIES—(continued)

This is (at last!) where a tape recorder comes into the picture. In fact, two machines are shown in the next illustration, (b) for Mr. Allen has added my machine to help with the job. One recorder has the background music on tape. This had earlier been recorded from the twin turntables with the help of a carefully marked script and a stopwatch. It should now feed into the projector via the mixer unit without any further trouble. The second recorder is playing the commentary to the mixer unit. The commentary has been carefully recorded on to the tape, with one second intervals between sentences. There is a pause control on Mr. Allen's recorder, and he will release each sentence as it is required by the script. This method is far superior to recording the commentary straight into the projector, as the projector is noisy (most makes are!) and it is difficult to record the voice without the buzz of the projector in the background. A further advantage is that Mr. Allen has the complete sound track of the film on two tapes should he ever find it necessary to re-record it in the future.

### Two Tracks from a Single Machine

Now is not the time to argue the merits of the luxury of two tape recorders, although to the serious tape user, two recorders are often a necessity. However, the G.B. 640 is far more versatile than at first apparent. It is fitted with interchangeable magnetic heads, for edge and full stripe, presumably to get the best possible quality from each stripe. We soon found, by a little experimenting, a far greater use for these interchangeable heads. Suppose one has a full stripe film. Record the background music first with the full stripe head. Rewind the film, remove the full stripe head, and insert the edge stripe head. Now record the commentary on the edge stripe head. By doing this the previous recording on full stripe will be half erased. It will be necessary to experiment to obtain the correct recording levels for each track. Then rewind the film again, and play it back with the full stripe head. The two tracks mix beautifully!

Another school of thought would record the commentary on the full stripe and the background music on the edge stripe. It is difficult to balance the level of the commentary on edge stripe with the music already recorded on full stripe, and the background music should be reduced in volume as the commentary comes in. However, I prefer a standard level of background music, not too obtrusive, throughout the film. The only snag is that the title and subtitles (if any) music should be on a similar level to the commentary, and then faded down, and this is difficult if the music is recorded before the commentary. On the other hand, the music should, hi-fi wise, have the benefit of the full track.

### Watch out for Noise

It is a matter of personal preference which style of recording is employed. Either way should give good results. One small point to watch (or, listen carefully for) is the noise of the drag as the clutch lets the commentary in. This should be balanced out by the background music. As a matter of interest it is possible to put three separate tracks on a full stripe with the edge stripe head, and conceivably, it should be possible to record a stereo sound track, if one modified the head for playback purposes. So far, G.B. do not recommend this, although they may introduce it if there is sufficient demand for it. The balancing track, on the other side of the film is not suitable for recording, as it is not laid with the same precision as the stripe on the sound head side. It is only intended to assist the film to spool up evenly.

The tape recorder is an invaluable asset to the amateur film producer, whether he be modestly and hopefully running his machine "wild" with a silent projector, or feeding months of hard work on to a magnetic stripe.

*NEXT MONTH: A review of new equipment including notes on the recent Photo Fair.*

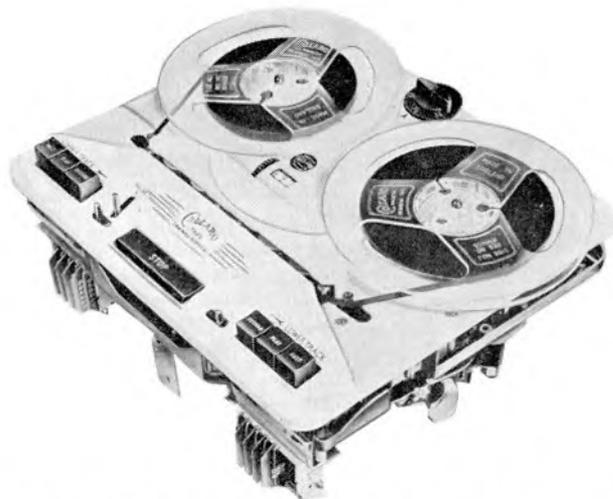
# ADD-ON MONITOR HEADS

## ● A USEFUL IDEA FOR KEEN OWNERS OF THE COLLARO TAPE TRANSCRIBTOR

TO know with absolute certainty that what is being fed into a tape-recorder will emerge subsequently on replay, perfect within the limitations imposed by the equipment employed, is an advantage enjoyed by few users of inexpensive tape-decks.

The Collaro Tape Transcripator, already versatile with its three speeds and four heads, lends itself admirably to an adaptation affording comprehensive monitoring facilities. The present writer has been using a machine incorporating this modification for about a year. It is very effective and can be carried out by anyone reasonably proficient in the use of ordinary hand tools, and at little cost over and above that of the two additional record/playback heads required.

Fig. 1 shows an outline of the principal of the four metal plates which it is necessary to make in order to modify the left-hand side (upper track) of the machine. Its exact location can be determined



The Collaro Tape Transcripator. It should be noted that the changes described here are for fairly expert handymen only, and do not constitute an official Collaro modification.

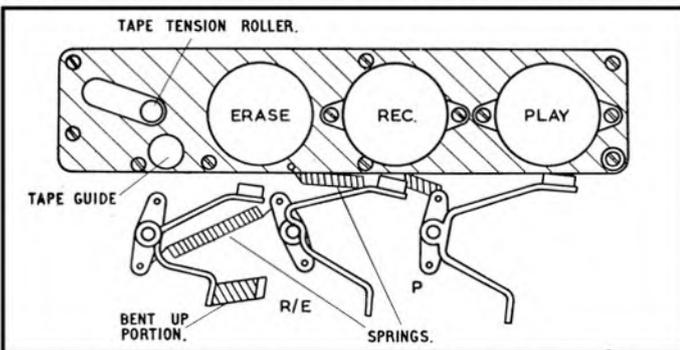


Fig. 1. Showing the relative positions of the extra head and the Erase, and Record/Playback heads on the Plate B. This drawing is to scale relative to the large photograph in the Collaro Instruction Manual, and an accurate picture of the placement may be got by tracing this diagram and laying the tracing over the photograph.

by placing a tracing of this diagram over the photograph in the Collaro Instruction Manual. The plates for the right-hand (lower) track are similar, but with reverse sides up.

Detailed drawings of the metal plates appear in fig. 2. They should be made in 16 gauge metal; a fairly hard brass is best for plates B and C, but the others can be of aluminium, if preferred.

Further brief details are as follows:—

### Upper Track

**Plate A.** This is attached by two 6BA screws and nuts to the tape tension arm, the roller and its spindle first being removed from the latter and replaced in the third hole drilled in this place. An additional hole must be drilled in the tape tension arm itself.

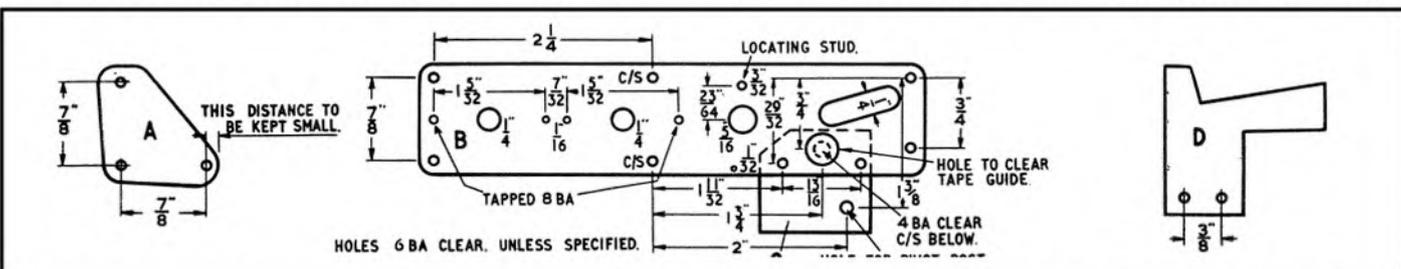


Fig. 2. The four metal plates. Plate A is bolted to the tape tension arm. Plate B replaces the existing head mounting strip, with Plate C fitted underneath to take the extra pressure pad. Plate D holds the Record and Erase pressure pads clear of the heads, except when recording.

**Plate B.** Is substituted for the existing head mounting plate. The existing spacers are used to hold the new plate the correct distance above the top plate of the deck. Since two of the mounting screws will now be placed under the Record head, countersunk screws will be required. The 8BA head mounting screws project some way below the plate, and holes (say  $\frac{1}{8}$  in.) must be drilled where necessary in the top plate to clear these.

Probably the best way to secure the extreme left hand end of the plate to the chassis casting is by self-tapping screws, spacers or washers being interposed beneath the head plate to ensure that the latter is absolutely flat and level.

On the original head plate the Erase head is located by two projecting studs. If the Erase head mounting hole is made a fairly close fit with the threaded spigot on the head, it should only be necessary to provide one such stud on the new plate. Its position is shown in the rough drawing. A small piece of brass rod may be sweated into the hole to form the stud, projecting slightly above the upper surface of the plate.

**Plate C.** This plate is mounted below the head mounting plate by means of 6BA screws and spacers similar to those upon which Plate B is mounted.

First the pillar on the chassis to which the plastic cover is normally secured with a self-tapping screw must be reduced in height with a hacksaw so that its top is level with the underside of the top plate. Rigidity will be gained if a long 6BA screw is passed right through this pillar (which is hollow) securing plate C and plate B thereto with a spacer sandwiched between. The tape guide mounted on this plate passes through a hole in plate B.

A pivot post to take the additional pressure pad carrier is also mounted on this plate. This can be fashioned from a 3-inch nail cut to the appropriate length and sweated into its hole in the plate. The top of the pivot post can be grooved quite easily with a hacksaw to take a circlip.

**Plate D.** This holds the Record and Erase pressure pads clear of their respective heads except when recording, preventing unnecessary head wear and removing a possible tendency of the pressure pad



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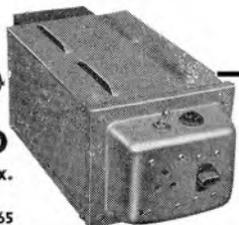
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**COLLARO MODIFICATION—(continued)**

springs to prevent the pinch wheel assembly returning fully to its Off position. It is attached to the Record safety slide with 6BA screws and nuts, one additional hole being drilled in the slide for the purpose.

One end of the Playback pressure pad spring is hooked into a small hole drilled at the front of plate B between the Record and Erase heads. The Record and Erase pressure pads share a spring as shown in fig. 1. The Record pressure pad carrier can either be bent as shown in the sketch to correspond with the new position of the Record head, or (preferably perhaps) the arm carrying the pad can be shortened and reshaped. The Erase pressure pad carrier engages with the stud projecting through the end of the pinch wheel bar, the lower portion of the carrier being bent up horizontally, as shown.

**Lower Track**

The only differences in mounting are as follows:—Plate B is screwed directly on to the top plate. This necessitates the substitution of a countersunk self-tapping screw for that marked X on fig. 1. In addition, a small sector of the top plate (also shown near X) must be filed away to clear the Erase head mounting nut and washer.

It may be necessary to insert one or two thin washers between plate B and the chassis of the deck when fixing down the extreme right-hand end of the plate to avoid any bending of the plate. No spacers will be needed between plates B and C.

**Final Notes**

Since the tape run is more angular than on the unmodified deck, the rewind speed will be affected a little. This is only serious when rewinding from right to left, due to the additional load imposed by the tape position indicator drive. The remedy is to substitute a really light driving band for the standard one.

The alterations required to the plastic cover expose part of the Erase heads, their pressure pad carriers, and the outer tape guides. If these alterations are carried out neatly they do not greatly detract from the appearance of the machine.

It is hardly necessary to point out that separate recording and playback amplifiers will be required, and the ingenuity of the reader will be exercised in devising, for example, instantaneous and noiseless switching from programme source to tape replay, and ultimately, in endeavouring to match the recorded sound to the original, an operation greatly simplified, whether carried out aurally or by means of instruments, by the modifications described above.

**A Fi-Cord at St. Moritz**



● In this year's Bobsleigh Championships at St. Moritz, Britain gained fourth place, led by Henry Taylor. This was a particularly remarkable performance as it was only Taylor's second year in bobsleigh racing. After the event he made further runs and on one taped a commentary over the entire distance using a Fi-Cord recorder. In the photograph above, Mr. Aubrey Gough, managing director of Fi-Cord Ltd., is seen putting the midget recorder in Henry Taylor's rucksack before the run. This tape can now be heard, with many others, in the firm's demonstration room at 40a Dover Street, London, W.1.

# TAPE, RECORDERS & ACCESSORIES

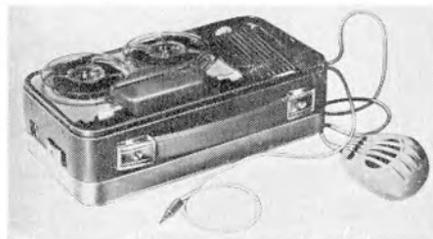
## FIRST DETAILS OF NEW PRODUCTS

● We remind our readers that notices of equipment listed and illustrated in this monthly feature are in no sense reviews. When figures, specifications and diagrams are published, these data are extractions from manufacturers' lists. When samples of this equipment are submitted for test, they are passed to our technical contributors, whose reports are published in a separate section.



★  
Grundig enter the stereophonic field with the TK55. The price is £96 12s.

THE Grundig TK55 Monophonic Tape Recorder and Stereophonic Tape Reproducer, first seen at the London Audio Fair, is now available. Monophonically, it embraces all the refinements of the TK35. On the stereophonic side, the TK55 will reproduce the left-hand channel—the output from the right-hand channel can be fed to the pickup terminals of a domestic radio, or hi-fi amplifier, alternatively, the recorder can be directly coupled to any existing stereophonic reproducing equipment. The Stereo Pre-Amps are claimed to be matched to exacting limits to give the best possible reproduction, and the instantaneous change-over from monophonic to stereophonic reproduction, clearly shown on an illuminated panel. The price is £96 12s., excluding microphone. Further details can be obtained from 39/41 New Oxford Street, London, W.C.1.



★  
A Battery Portable Recorder from G.B.C. The Clarion

G.B.C. ELECTRONIC INDUSTRIES LTD., are the British agents for a new German battery portable tape recorder, The Clarion, the price is £26 5s.

This machine operates at  $3\frac{1}{2}$  i/s. Four transistors are used, and power is provided by four 1.5V U2 d y batteries giving 50 hours playing time, or alternatively it can be run from a 6 volt car battery, the consumption is 0.1 amps. Input voltage 200 mV, 200 ohms impedance. The output is rated at 20 mW. There is an outlet for driving an external amplifier, this has an output of 1 volt, 1,000 ohms. The claimed frequency range is 200-6,000 c/s. 3 inch tape spools are fitted and when using double play tape this gives 22 minutes recording on each track.

The dimensions are  $9\frac{1}{2} \times 5 \times 3\frac{1}{2}$  in., the weight is only 5 lb. including batteries. It is supplied with a clear plastic cover to the tape deck, and moving coil microphone. Further details can be obtained from G.B.C. at 121/123 Edgware Road, London, W.2.

### Super-Grade M.S.S. Tape

FOR the tape recorder user who wants extra special quality, M.S.S. have produced "Super-grade", a recording tape using a Polyester base 1.5 thou in thickness, which, the makers claim, means that is virtually indestructible. The tape is supplied only on 7-in. spools, 1,200 ft. to a reel, with absolutely no joints. To ensure that the electrical and magnetic characteristics are maintained throughout, each reel is drop-out tested, each 1/100 in. being tested separately. Each tape is also pen tested and a chart of this test is supplied with each reel, together with a test certificate showing bias, noise level and frequency response variations from the standard. A record of each reel will be kept for two years after sale so that, on request, further matching reels can be supplied. The spools are sealed in a polythene container. This tape will be available through the normal trade channels, price 50s. In cases of difficulty write to M.S.S. Recording Co., Ltd., 21 Bloomsbury Street, London, W.C.1.



★  
A New Motek 3-speed Deck The K.10

MODERN TECHNIQUES are now in production with their new tape deck, the K.10. Several new features are incorporated in this model, but possibly the greatest change is in the appearance. It has been attractively restyled in two tones of grey.

An enlarged drive wheel on the rev. counter spindle ensures true and accurate tape positioning, and the specially-designed non-slip push buttons make operation of the K.10 positive and simple. Improved spool holders take up to 7 in. reels. An additional improvement to the K.10 is its frequency response. The greatly improved record play head gives a frequency response of better than 40 c/s-12,000 c/s at 7.5 in. per second combined with extremely low hum pickup. This should simplify technical problems met in tape recorder design. Manufactured by Modern Techniques, Wedmore Street, London, N.19.

### The Elizabethan Princess

THE first new recorder to be announced using the Motek K10 is the Elizabethan Princess, manufactured by E.A.P. (Tape Recorders) Ltd. This recorder is housed in an attractive two-tone cabinet measuring only  $16 \times 11\frac{1}{2} \times 7$  in. and weighing 23 lb. The claimed frequency range at the 3 speeds is 60-12,000 c/s at  $7\frac{1}{2}$  i/s, 60-8,000 c/s at  $3\frac{1}{2}$  i/s and 60-4,000 c/s at  $1\frac{1}{2}$  i/s. Facilities included are mixing of two programme sources, superimposing, independent use of the amplifier, monitoring of programme material on internal loudspeaker, provision for feeding external amplifier and external loudspeaker.

The amplifier has an output of  $3\frac{1}{2}$  watts, the speaker is a  $7 \times 4$  in. high-flux elliptical. The price is £40 19s., which includes microphone, tape and accessories. Further details can be obtained from the manufacturers at Bridge Close, Oldchurch Road, Romford, Essex.



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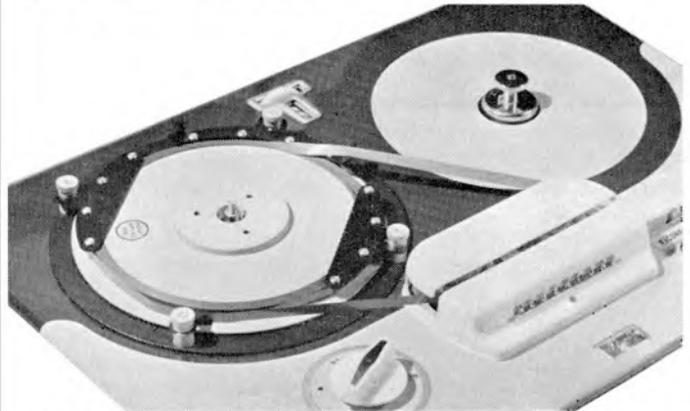
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### TAPE, RECORDS & ACCESSORIES—(continued)



GUY'S CALCULATING MACHINES LTD., have produced a most useful and ingenious Endless-tape cassette called the **Brittape**. A cassette of this type has very wide application including soak testing of tape recorders; control of automation processes; exhibition commentaries, sales and loudspeaker messages; museum commentaries and language teaching. Intending participants in "The Tape Recorder" "Electronic Music Competition" will immediately see that it has many uses.

The Brittape will hold up to 200 ft. of tape, but it is hoped to introduce shortly a new model that will hold twice this length. It will fit most tape decks that take a 7-inch spool and have a capstan and pinch roller assembly. The price is £6 8s. 6d. including postage, plus 6s. 9d. for 200 ft. of tape. It is available direct from the manufacturers at **Truro Road, Wood Green, London, N.22**



The Elektron  
EMG9/2  
Distributed in  
the U.K. by  
T.S.L.



TECHNICAL SUPPLIERS LTD. (T.S.L.), claim an incredibly high frequency response of 30-16,000 c/s at 3½ i/s for the German **Elektron EMG9/2** tape recorder, which they handle in this country.

This is a single-speed recorder suitable for mains supply of 100-240 volts AC. The spools are 5½ in., a single squirrel cage motor is used; the combined wow and flutter is said to be 0.15 per cent. and speed tolerance better than ± 0.75 per cent. Bias frequency approximately 50 Kc/s. Signal to noise ratio better than 53 dB unweighted. No distortion figures are quoted. Fittings include Magic Eye indicator, 3-digit counter, record safety lock.

Three inputs are provided for Radio, 3 mV at 100 Kohms; microphone, maximum signal 3 mV at 2,000 ohms and Pickup 100 mV at 1 Mohm impedance, all sensitivities for 3 watts output. Monitoring of incoming signal through built-in speaker. Outlet of 500 mV at 10 Kohms for feeding external amplifier. The size is 13 × 10½ × 6 in. and the weight 17½ lb. The price is £49 10s. 6d. Distributed in the U.K. by **Technical Suppliers Ltd., Hudson House, 63 Goldhawk Road, London, W.12.**

We certainly look forward to the opportunity of reviewing this machine for which such high claims are made, and we have no doubt our readers will await this with similar interest.

# EQUIPMENT REVIEWED



★  
THE PHILIPS  
AG 8108G  
3-SPEED TAPE  
RECORDER  
★

★ **Manufacturer's Specification:** Mains Voltage: 220-245, 110-127 volts, A.C. 50 c/s. Consumption: 60 watts. Valves: EF86, ECC86, ECL82, EZ80 rectifier, EM81 Level Indicator. Tape speeds:  $7\frac{1}{2}$  i/s,  $3\frac{3}{4}$  i/s, and  $1\frac{7}{8}$  i/s. Frequency response: At  $7\frac{1}{2}$  i/s 50-18,000 c/s, at  $3\frac{3}{4}$  i/s, 50-12,000 c/s, at  $1\frac{7}{8}$  i/s, 50-6,000 c/s. Recording Sense: Top track, left to right. Signal to Noise Ratio: better than 45 dB. Wow and Flutter:  $7\frac{1}{2}$  i/s, <0.2%,  $3\frac{3}{4}$  i/s, <0.3%. Fast rewind time: 2 minutes for 1,200 ft. tape. Automatic stop. Pause control. Loud-speaker:  $6 \times 4$  in. elliptical. Inputs: Mic. 100 K, 2.5 mV; P.U. or Radio 600 K—1 Megohm, 230 mV. Outputs: Line out, 2V, 50 K, by-passing tone controls; Monitor, 100 mV, 1,000 ohms. Output power: 2.5 watts. Size  $15\frac{1}{4} \times 13 \times 8$  in. Weight: 30 lb. Price: £65 2s., complete with tape and moving coil microphone.

Manufactured by Philips Electrical Ltd., Century House, Shaftesbury Avenue, London, W.C.2.

THE descriptive literature enclosed with the Philips 8108G is almost completely devoid of technical information, no claims to a specially wide frequency range or particularly high signal/noise ratio, etc., but instead a how-to-work-it description aimed at the absolute new-comer to a tape recorder. To an expert this suggests that the machine is one of the makes-you-the-hit-of-a-party type and it is, therefore, surprising to find that the technical performance is outstanding. It is quite one of the most satisfying machines the reviewer has had for some time. And this is achieved at a price of 62 gns.

Rather conservatively styled in blue and grey leathercloth, the outside dimensions are only  $15\frac{1}{4} \times 13 \times 8$  in. and the weight 30 lb. Thus the machine is truly portable without having to strain the meaning of the word. The lid is completely detachable and includes a buttoned pocket holding two 7 in. spools. As the face of the pocket almost touches the top of the two spindles, two further spools may be carried in the playing position without fear of them becoming loose and milling around inside the case.

### All the Keys move easily

Nine push buttons are divided into three groups, the left hand group selecting "Playback", "Record" and "Instantaneous Stop"; the centre group, "High Speed Re-Wind", "Stop" and "Wind On"; whilst the right hand group selects the Tape Speed,  $1\frac{7}{8}$ ,  $3\frac{3}{4}$  and  $7\frac{1}{2}$  i/s. All the keys move easily and have a nice feel, though they must be pressed firmly down to achieve the desired result. Two concentric knobs on the left hand side control playback volume and tone, both knobs doing double duty as microphone and radio gain controls during recording. On the right hand side of the deck there is an EM 81 type of magic-eye volume indicator and in rear centre a three digit footage counter. With the exception of the microphone socket all the sockets are collected together in a small recessed panel sensibly placed on the left hand side of the machine where they can be used without having to turn the machine round to insert

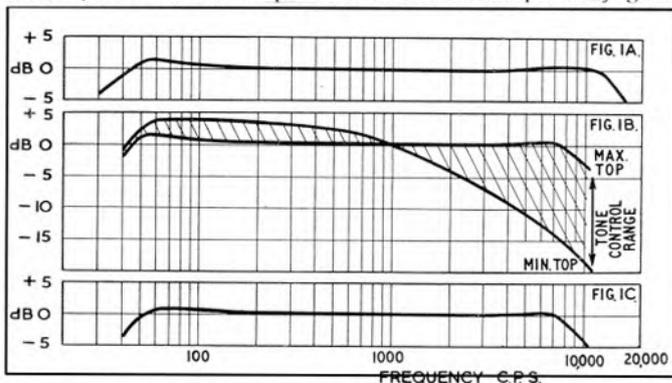
the plugs. Four sockets are provided on this panel "gram" or "radio" input, "external speaker", "external amplifier" and "monitor headphones", the internal speaker being automatically disconnected when an external speaker is in use. The mains cable is stored in a recess in the underside of the machine, this being large enough to take a standard British 13 amp plug in addition to the lead.

**Objective Tests:** Two replay curves are shown in Fig. 1 as the frequency response measured at the "external amplifier" terminals is slightly better at the top end of the range than the response measured at the "external speaker" terminals. The shaded area indicates the range of the "top cutter" tone control.

When recording and replaying your own programme material, the combined record and replay response is significant and is shown in fig. 1c, d & e for each of the three speeds. Though the frequency ranges recorded may not be the widest ever measured they are certainly in the top three best. At the lowest tape speed,  $1\frac{7}{8}$  i/s the response is far better than that of any commercial AM radio receiver that has been checked.

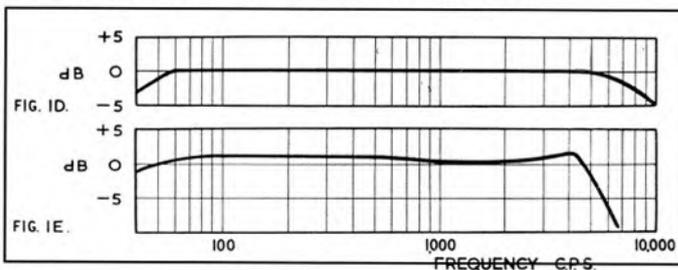
### "Signal/Noise Ratio . . . exceptionally good"

The signal/noise ratio, the measured ratio of a 1,000 c/s signal recorded at full modulation to the noise remaining after the signal is erased on the machine, is shown in Table 1 for the three speeds. In this respect the 8108G is exceptionally good.



There is an insignificant difference between the weighted and un-weighted values, a good indication that mains hum components are negligible.

Table 3 indicates the input voltage (Kc/s) that is required at the microphone and radio/gram sockets to produce full modulation of the tape as indicated by the magic-eye.



Wow and flutter due to small variations in the instantaneous speed of the tape past the head is low on all three speeds, (Table 2) contrary to the commonly held view that the frequency response obtainable at low speeds limits the usability of a tape machine it is more often limited by the speed irregularities. It is quite unusual to find a machine on which music can be acceptably recorded at a tape speed of  $1\frac{7}{8}$  i/s without having to make every allowance for low tape speed. Not so with the

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# WESTWOOD

### EQUIPMENT REVIEWED—(continued)

8108G, for while the performance at this speed is obviously inferior to that obtained at the higher speeds music is quite acceptable.

Amplitude distortion (harmonic and intermodulation distortion) in tape recorders is something that gentlemen do not discuss, for the majority of machines have a shocking performance at the low frequency end of the audio range. It is not unusual to find that the power output at 70 c/s for (say) 5 per cent. distortion is less than one tenth of the rated power output, a subject that will be elaborated on in a separate contribution. It is mentioned here because this is an aspect of the performance in which the Philips 8108G is unusually good.

Table 1 Signal/Noise Ratio

Tape Speed 7½"/sec	
Unweighted	-49 dB
Weighted	-51 dB
Tape Speed 3¾"/sec	
Unweighted	-55 dB
Weighted	-52 dB
Tape Speed 1¾"/sec	
Unweighted	-55 dB
Weighted	-57 dB

Table 2 Wow and Flutter

Tape Speed 7½"/sec	
Replay only	0.08%
Record and Replay	0.1%
Tape Speed 3¾"/sec	
Record and Replay	0.13%
Tape Speed 1¾"/sec	
Record and Replay	0.15%

Table 3 Input Voltage

Input voltage to produce closing of Magic Eye at 1 Kc/s 150 mV

**Subjective Performance:** The 8108G is mechanically quiet and relatively free from vibration in operation even when re-winding at high speed. The tape spools evenly and neatly and the braking system is unusually effective in preventing overspill when stopping a high speed wind or re-wind. An automatic end-of-reel stop actuated by a foil strip is fitted and works most effectively, though it necessitates the addition of a foil strip to all your commercially recorded tapes if the stop is to be used. From this point of view the tape tension end-of-reel switches are to be preferred as they involve no modification of the commercial tapes. All the controls have a pleasant, firm feel and there is an indefinable degree of satisfaction in using the machine. My only adverse comment is directed at the internal speaker which has a performance far below the remainder of the machine. When a quality performance is required an external speaker must be used. This is not an unusual comment, for any tape recorder that is to be portable cannot provide the space that is necessary to ensure good performance from the loudspeaker.

The provision of sockets for monitor headphones and an "external amplifier" signal is an unusual but valuable feature. If headphones are not used for monitoring it is generally difficult to record from a microphone used close to the machine for acoustic coupling between monitoring loudspeaker and microphone limits the gain that can be used.

### Summary

In summary, the Philips 8108G is one of the best four machines reviewed and is particularly good value for money at a price of 62 gns. It is another Continental machine that should be carefully evaluated by all British manufacturers of tape recorders.

J. MOIR

**Next Month:** J. Moir will review the Fi-Cord Battery Portable and the Wyndors Viscount which incorporates many interesting features.

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# our readers write . . . . .

★As regular readers will know, the first three letters printed each month have been placed in the order which, in the Editor's opinion, merit 1st, 2nd, and 3rd awards of a spool of tape. The prizes are 7-inch, 5-inch, and 3-inch spools respectively. If you send us a letter which you don't want to be published, please mark it NOT FOR PUBLICATION.

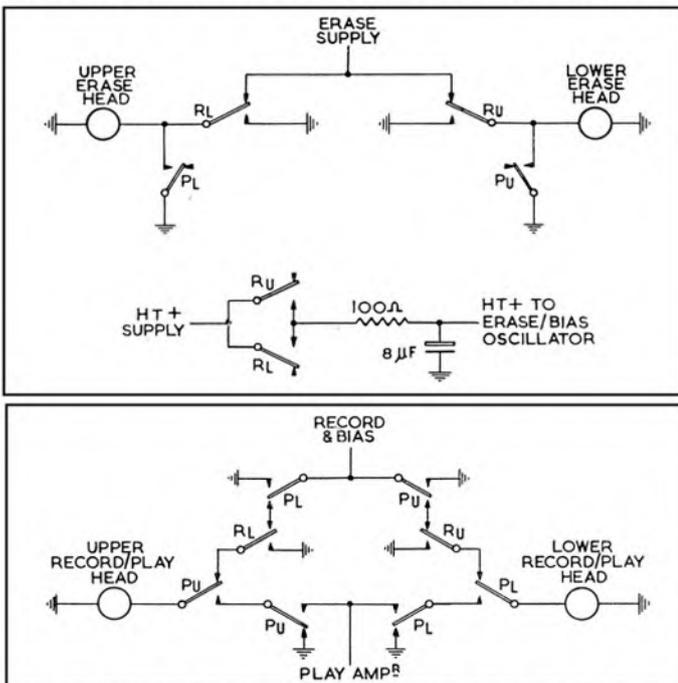
## . . . about switching heads

From:—H. d'Assis-Fonseca, 45 Greenhill Park, New Barnet, Herts.

Sir:—In recording on tape one very important rule is that the erase and bias supplies must not be cut off suddenly from the heads but must be allowed to die away slowly to avoid magnetisation of the heads. With recorders using only two heads there is no difficulty in arranging for this, the HT supply to the erase/bias oscillator being cut when the record switch is opened.

Tape decks having two pairs of heads, as in the popular Collaro tape transcriptor, make the problem a little more complicated and the rule is usually ignored. This particular deck is equipped with individual switches operated by the record and play buttons, each switch having eight changeover sets. In the arrangement recommended and supplied by the manufacturers the four heads are normally short-circuited the required pair of heads being switched to their supplies when the relevant button is pressed.

Thus release of the button at the end of recording immediately disconnects the heads and short circuits them, probably leaving them magnetised to give noisy tape. A better arrangement is shown in the attached sketch. In this all four heads are normally connected to the



Head switching for Collaro Tape Transcriptor. Note that  $R_L$ ,  $R_U$  and  $P_L$ ,  $P_U$  indicate the Record and Playback switches for the lower and upper tracks respectively.

supplies, the unwanted heads being disconnected and short-circuited when a recording is made.

The record button switches are arranged to close the HT supply to the oscillator with the usual  $8\mu\text{F}$  condenser to give gradual die-away. The resistance in series with this is to prevent the very heavy current surge which would normally result on switching on and might weld or otherwise damage the switch contacts.

Yours faithfully

## . . . about rev. counters

From:—J. G. Sinclair, 5 Rosebank Road, Edinburgh, 5.

Dear Sir:—Regarding Mr. B. L. Hensman's problem, in your

May issue of tape-lengths and time of run, may I give my experience? The first point for beginners to know is that the tape lengths 200', 800', 1,200' are hardly ever accurate. Some are plus, others minus to the quoted figure; secondly very few revolution counters are dead accurate—mine has an established error of about 20%, i.e. for 20 revolutions done by hand it gives a reading of 25 on the counter. Then, even small variations in hub diameters of spools, uncertain back-tension on the tape, to say nothing of possible variations in motor speeds make accurate registration of positions on a tape difficult.

I minimise the trouble by using the same spool on the right-hand spindle (i.e. the spindle to which the rev.-counter is geared) and, assured of this constant, I compile a Rev. Time Table, by stop-watch, noting the rev. figures for every 30 secs of tape run. One could, of course, gain greater accuracy by dropping to 15 or 10 secs per reading.

From this table one can tell—having first ascertained by trial run the rev. counter figure for any fully-run tape—what time is left for recording at any stage by that tape's recording run. The table is also useful in ascertaining the time-interval between any two rev.-counter figures, in case one may wish to interpolate any recording of known time length, e.g. can I interpolate a song lasting 3 min. 30 sec. between counter numbers 639 and 693? My table shows that this is possible on my machine with one minute to spare, sufficient to make an announcement of the title and other details. Best wishes.

Yours faithfully

## . . . about spool alignment

From:—Robert Albison, 21 Deeplich Street, Rochdale, Lancs.

Dear Sir:—I wonder how many of your readers are suffering as I have done for the past twelve months or so from misalignment of the Spool Carriers.

My Tape Recorder is fitted with a Collaro Deck and I have only just discovered, after obtaining a Service Instruction Manual from Messrs. Collaro, that the spool carriers can be adjusted. For months I had been under the impression that every one of my spools—including the new ones—were warped and I was pestered by the ssh-ssh-ssh- of tape catching spool with each revolution.

The adjustment is very simple to carry out and I quote from Messrs. Collaro's Manual:

"Adjustment for spool alignment is provided by two 4 B.A. hexagon headed screws at the back of the tape tensioning arm carrier. The outer screw is for adjusting in a forward and outward direction whilst the inner screw will adjust in an inner and backward direction. Adjust until spool is level all round with top cover. Make sure to use a true running spool".

I think it would be a good idea—to say the least—if such a manual were supplied with all recorders fitted with this deck for there are many adjustments one can make quite easily and at no expense.

Yours faithfully

The manufacturers of the Collaro Deck make a practice of supplying a copy of their Instruction Manual with each deck, but will be glad to help any owner of a tape recorder with Collaro Deck who has not got the Manual. The address to write to is: Collaro Ltd., Ripple Works, By-Pass Road, Barking, Essex.—(Editor).

## . . . about being at the cross-roads

From:—W. J. Tomlinson, 62 Beacontree Avenue, London, E.17.

Dear Sir:—It would appear from last month's correspondence that the magazine is fast approaching the cross-roads in the choice of readership. Are you going to cater for the tape recordist who likes to think and do for himself as far as possible or are you going to be a reviewing medium? To my mind judging by the contents of the issues we have had to date you have got to enter one or other of the roads in front of you and frankly I hope it is the "Do it Yourself" route because when I think of the technical resources you must have at your disposal I fairly burst with questions which would no doubt in time would be answered.

Mr. H. R. Jones of Poole need not despair because he has no second microphone—a certain type of moving-coil earpiece can be used

(Continued on page 271)



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Grundig TK 20 ... ..	52	7	0	0	3	19	4
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Elpico ... ..	55	7	5	0	4	3	4
Telefunken 75 with microphone ... ..	55	7	5	0	4	3	4
Saja Export ... ..	56	7	6	0	4	5	10
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Philips 8108 ... ..	63	8	3	0	4	16	8
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Brenell Mk V with microphone ... ..	69	8	11	0	5	5	6
Stuzzi Magnette ... ..	69	8	11	0	5	5	6
Grundig TK 30* ... ..	72	9	12	0	5	10	0
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Harting HM5* ... ..	82	10	12	0	6	5	8
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OUR READERS WRITE—(continued)

without modification as an excellent speech unit and anyone who does not have pounds to lash out on ribbons can acquire a useful item for a few—and I mean a few—shillings. These earpieces can be picked up as surplus equipment. I'll let anyone interested have details. s.a.e. please. Yours faithfully

Note:—Thanks, Mr. Tomlinson. Letters which say what readers want are valuable. But if we appear to be at the Cross Road so soon, please remember our "youth". We are six issues old with this number, and we have about 20,000 readers to satisfy. As we see it, reviews of equipment are an essential feature of a paper which takes life at all seriously. Like you, however, we also favour "Do-it-Yourself" features (and if you read "Hi-Fi News" you will see this). Equally important are pages dealing with Readers' Problems, Exchanges of ideas through letters, New uses for recorders, Reports—usually in article form—of what others are doing. And so on. And, if as we hope you are still a reader in a year's time, all these things and more should be available in "The Tape Recorder". Editor

... about fitting a Stroboscope

From:—S. Jepson, A.R.P.S., "Bentcliffe," St. Aubin, Jersey, C.I.

Dear Sir:—You have published useful articles about keeping sync. between cine projector and tape recorder, a subject in which I have been very interested for many years. As many readers must know, one of the simplest methods of doing this is to light a strobe (48 bar on a pulley 2:38 in.) by spill light from the projector lens. This is for 7.5 i/s, for 3.75 you need a 96 bar strobe.

The strobe pulley is rotated by the moving tape, and if you do not wish to fix any bracket for pulley spindle on your tape deck, fix it on top of a piece of wood the same height as



The writer of this letter enclosed the above photograph which illustrates the use of a Gramdeck unit and an old-fashioned gramophone. The sound track can be set to keep in sync. with a fixed speed projector. The stroboscope is driven by the tape and lit by the projector flicker.

the tape machine, and then jam it firm against the side with heavy books.

This method has the great advantage over governed projector speeds that if any tape machine runs slightly slow or fast, there is compensation through adjusting the projector speed, set by watching the strobe, which must appear stationary in the lens flicker light. In other words, the tape and film are "light-locked." No other gimmick is required beyond the pulley and holder, and for the former an 8mm. cine spool built up to the right dia. with film or tape is ideal.

For illumination, place the tape recorder in front of the projector and as high as possible, with a piece of thick silver paper (from tobacco packet, etc.) folded and tucked above the lens. When bent down slightly it will throw the light from the top of picture (generally the sky and therefore the brightest), on the strobe, and can be bent in any direction. If you want more light still on the strobe, puff cigarette smoke into the light beam and this throws down a great deal of light.

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The rate is 6d. per word, with a minimum charge of 7s. 6d. Box numbers may be used for an extra charge of 1s. 6d. The trade rate is 9d. per word, plus 2s. for a box number, conditions on application.

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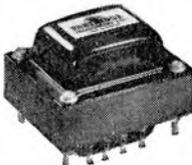
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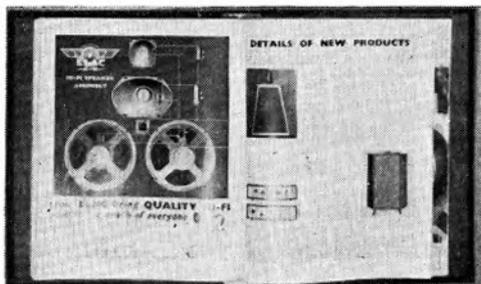
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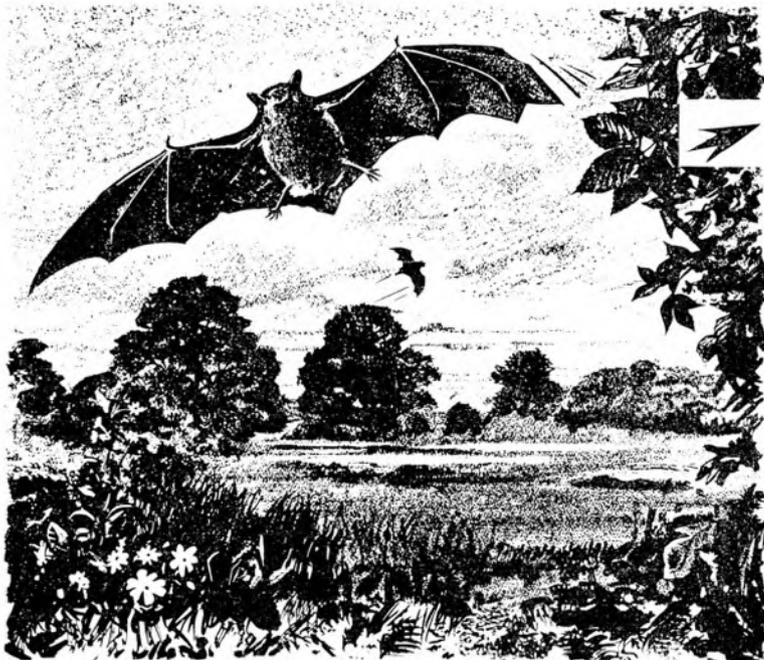
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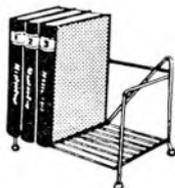
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## ADVERTISERS' INDEX

	Page
Basshorn ... ..	274
Bradmatic ... ..	266
Chelsea Record Centre ... ..	268
Dickinsons of Pall Mall ... ..	270
E.M.I. Sales & Service Ltd ... ..	236, 237
E.A.P. Tape Recorders ... ..	234
Easysplice ... ..	268
Francis of Streatham ... ..	258
Grundig (Gt. Britain) Ltd. ... ..	275
H. C. Harridge ... ..	266
Hi-Fi News ... ..	276
Hi-Fi Year Book ... ..	250
Home Radio of Mitcham ... ..	272
Howard Photographic ... ..	270
Lee Electronics ... ..	268
Lockwood & Co (Woodworkers) Ltd ... ..	274
Lustraphone ... ..	264
M.S.S. Recording ... ..	273
Nusound ... ..	258
Pamphonic Reproducers Ltd ... ..	260
Quality Mart. ... ..	262
Ray Electrical ... ..	268
Rapid Recording ... ..	274
Recorder Co. Ltd. ... ..	258
R.E.W. Tape Recorders ... ..	260
Simon Sound Service ... ..	240, 242
Tape Recorder Centre (Sypha Sound Sales Ltd.) ... ..	238
Tape Recorder Service Co. ... ..	246
Technical Suppliers Ltd. ... ..	248
Valradio Ltd ... ..	264
Vortexion Ltd ... ..	235
Welmec—Telefunken ... ..	256
Westwood of Oxford ... ..	268



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