

the TAPE

PRICE 1/6

MARCH 1961
Vol. 3 No. 2

RECORDER

INCORPORATING "SOUND AND CINE"



IN THIS NUMBER

- A School in the News - How an Enterprising Tape Recording Group got "On the Air"
- Reviewing Tape Recorders-Mechanical Noise Measurements
- Pictures with a Peal-Recording Church Bells to Accompany Colour Slides
- Reviews of Tape Recorders and Accessories
- Teaching Tape- A Special Series for Beginners
- Tape News from Here and There and Everywhere
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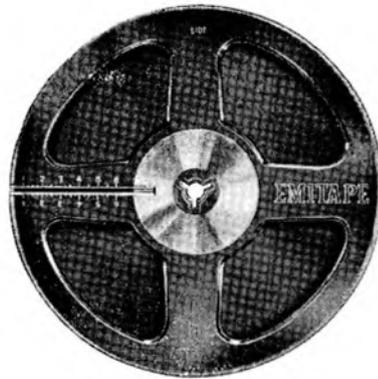
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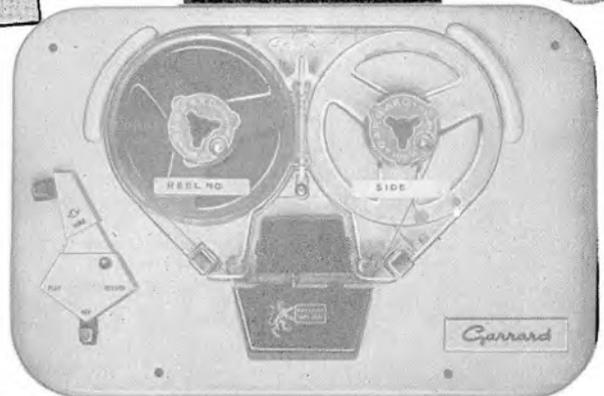


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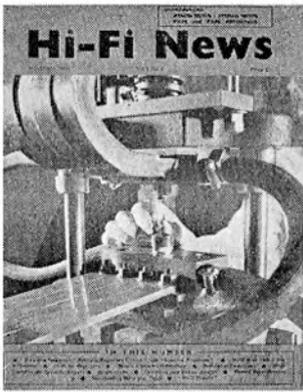
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- Q** I'd certainly like to . . . but I know absolutely nothing about electronics . . . I wouldn't know where to start!
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- A** You only do one simple step at a time. The instruction book tells you exactly what part to use, where it goes and exactly how to install it. You simply go down the checklist of 'things to do'. Detailed illustrations make it even easier.
- Q** But wouldn't I have to solder?
- A** Yes, but there's nothing mysterious about a simple solder connection.
- Q** But I've never had a soldering iron in my hand!
- A** Again, the instruction book tells you . . . and shows you . . . exactly how to use a soldering iron. It's really very simple.
- Q** I don't know . . . I've seen the inside of a radio before. It looks awfully complicated.
- A** You're right . . . but remember . . . with a Heathkit model you do only one simple step at a time.

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(✓) Connect a 22 KΩ resistor (red-red-orange) from socket C1 (NS) to ground lug C9 (NS). See Figure 8.

(✓) Connect a .005 μfd disc capacitor from socket C4 (NS) to IF transformer Q4 (NS).

() Bend socket lug C5 and IF transformer lug Q3 toward each other until they make contact and overlap slightly. Solder the connection securely. (1).

() Install a .005 μfd capacitor from socket (NS) to ground lug C9 (NS). Dress the capacitor close to chassis, under the capacitor previously installed.

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Provision is made for the addition of a stereo head with both channels available either to an external stereo amplifier, or one channel through the internal amplifier and the other externally.

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The R40

3½ ips 60—8,000 ± 3dbs

7½ ips 50—15,000 ± 3dbs

15 ips 40—20,000 ± 3dbs

(signal-noise ratio at 7½ ips—48dbs)

Separate record amplifier

2 per cent total harmonic distortion

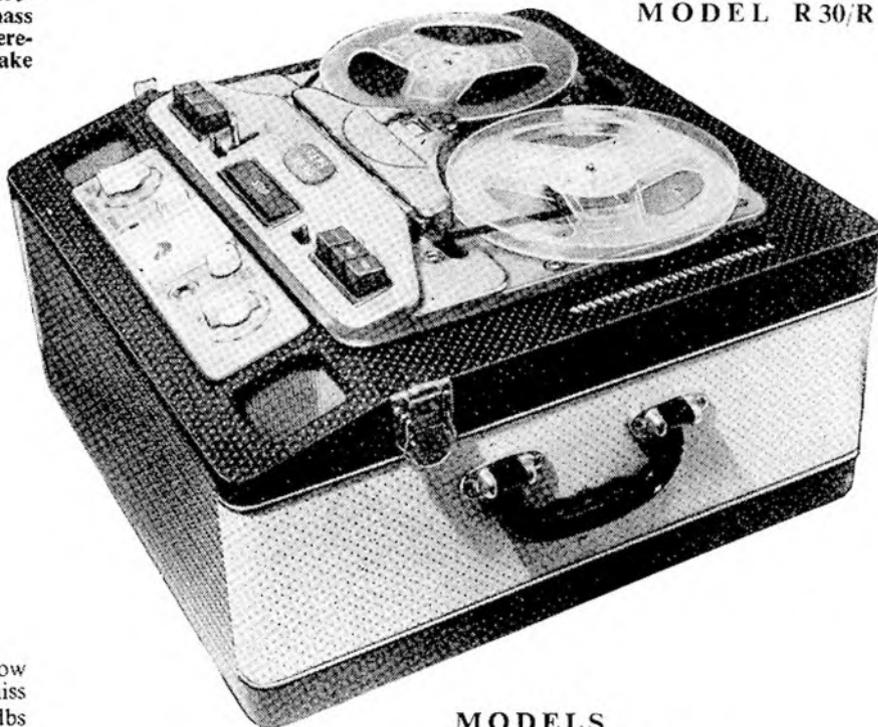
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Separate bass and treble controls ± 15dbs at 14 kc/s—15dbs at 40 c/s

Supplied complete with Acos 39/1 mic. stand. and 1,200' P.V.C. tape

MODEL R 30/R 40



MODELS

R20 62 GNS. with magic eye record indicator
R30 66 GNS. with meter record level indicator
R40 70 GNS. as R30 but with push/pull sound output.

HOW MANY CYCLES?

From the correspondence we receive it appears that a great deal of importance is attached to the frequency response in its relation to reproduction, generally to the exclusion of the other inter-relating factors—i.e., background noise, harmonic distortion, transient response, etc.

In tape recording a balance must be sought between these factors in order to approach as near as possible to the original sound. The designer must decide at any given speed whether wide frequency response, low distortion or negligible background noise should be given precedence for one can be improved at the expense of the other.

It is generally known that to obtain the best results the bias is adjusted individually on each machine to an optimum level. This implies that a series of recordings are made at some middle frequency, generally 1,000 c/s and the bias current adjusted until maximum output is obtained on playback. The bias is then increased until the output drops by approximately 10 per cent. This is the optimum point at which distortion and background noise from the tape is at minimum. However, the high frequency output from the Playback Head is attenuated as the bias increases towards optimum; the higher this frequency the greater this effect. It is not known for certain the reason for this attenuation; one theory suggests the bias causes partial erasure, which is accentuated as the bias current increases.

A more plausible answer takes into account that at 7½ in. per second at 7,500c/s a distance of 0.0001 in. between tape and Playback Head results

in a loss of 6dbs or half the output; this loss is nearly proportional to frequency. Now below optimum bias the surface of the oxide coating on the recording tape is the most sensitive part and no distance loss can occur, subject to the tape making intimate contact with the Head. However, at optimum bias the point of maximum sensitivity or remanence is below the surface of the oxide giving a distance loss. This is borne out by the fact that a thinner oxide coating improves the treble response but with reduced overall sensitivity.

You are by now probably asking what all this boils down to—briefly then, a Playback Head with a very fine gap will not by itself improve the treble range unless:—

1. It is under-biased, which means higher background noise and greater harmonic distortion.
2. Receives large amount of treble boost during record which leads to increased distortion in the treble region, and excessive ringing on the transients.

Finally to see if you really need all those practically inaudible cycles try recording on a really good machine® at 7½ in. per sec. and then at 15 in. per sec. to compare the difference.

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EDITORIAL

WE hope our readers will forgive us for dealing mainly with facts and figures in this column—particularly since the principal idea is to enlist their aid to provide them. On page 89 we publish a "Field Trail" review of a stereo microphone, and this feature also touches on the uses of stereo recorders and the relatively small percentage of twin-channel instruments in use. Stereo, as used in the home, is an unknown quantity. No one knows, or can even guess roughly, how many stereo tape recorders are in use in the U.K. or Commonwealth. Still less can they guess what the instruments are used for. If these and other facts were known, not only could we gauge more realistically what features to plan, but we could make much more useful information available to other readers with genuine stereo questions in mind. Of even greater importance, makers of equipment, accessories, and possibly stereo tapes, might cast a far more enthusiastic eye upon the stereo side of the business if they knew the state of the poll.

We have several times considered the possibility of inviting a panel of selected readers to help us with a full-scale series of reports, based on questionnaires in *Hi-Fi News* and *The Tape Recorder*. Now, as a tentative feeler we invite our stereo readers to help us fill in a few of the gaps. What we wish to establish is the current position of stereo in terms of tape. For this purpose we would greatly appreciate answers to the following questions—and we emphasise that names and addresses will not be published or made available to any other source without the permission of each writer, should the occasion ever arise.

The questions are: (1) Make and model of recorder; (2) microphone used; (3) stereo recordings made from radio, disc, microphone; (4) Recorder used only for stereo playbacks but for mono recordings; (5) number of stereo recorded tapes owned; (6) No stereo yet but contemplated; (7) two-track or four-track contemplated; (8) stereo used specifically for any particular job; (9) Name and address.

Readers who are kind enough to co-operate in this matter will help us still further if they will send this information on a separate sheet of paper, and not as part of any covering letter. Apart from the above request, we shall be most interested to hear (for publication if possible) of what readers are doing with stereo, and how they may be using it for various types of work and/or amusement. In advance we thank everyone who participates and we hope that we may be able to provide data, chapter and verse from the results that will reach to the benefit of many.

TAPE RECORDER APRIL—ON SALE MARCH 24th.

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COVER PICTURE

HAVE you recorded any good Bucorvus Abyssinicus (Young Abyssinian Ground Hornbill) lately? In 24 countries of the world, the celebrated Armand and Michaela Denis have shown television viewers how wild animals work and play. This famous pair now have a Zoo of their own, and our cover picture was taken there during the production of a new series of programmes for American TV entitled "Animal Land". Readers will recognise a familiar outdoor recording combination—Fi-Cord 1A battery-operated recorder, and Grampian DP4 microphone. (See also photograph on page 67 and microphone review on page 95).

NEXT MONTH

WITH the approach of the 1961 International Audio Festival and Fair, we shall preview next month some of the tape recording highlights at this popular event. The venue is once again the Hotel Russell, and the dates are April 6th to 9th. As in previous years, we have a supply of tickets at this Editorial Office, and will be glad to supply these on receipt of a large stamped addressed envelope. Also next month there will be another *Sound and Ciné* article by Richard Golding, in which he pays particular attention to the sound recording aspect. Home construction enthusiasts will be looking forward to the next instalment of A. Tutchings "Build This Portable Recorder", and there will be another recorder modification submitted by a reader. Several interesting machines are in the process of being tested, and will be featured in our "Equipment Reviewed" pages. The usual full coverage of *Tape and Club News* is also scheduled. Should you have any difficulty in obtaining copies of *The Tape Recorder* please get in touch with us, so that we may help you to locate your nearest supplier.

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).

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By I. W. JARMAN

PART 8—TAPE EDITING

IN the previous article, I dealt with superimposition—the superimposing of one sound on another. It was pointed out that when the second recording is made over the original, then the volume of the original sound is considerably reduced due to the bias erase effect. This reduction is, of course, instantaneous and appears as a sudden drop in volume, giving a somewhat jerky presentation. To improve the presentation and give a smoother continuity it is necessary to fade down the background (original) sound just prior to the superimposed material and fade up again immediately after it. One method of doing this is to record the fades separately, and edit them into the main tape, and it is editing I shall be dealing with in this article.

Tape Jointing

There are available to the amateur two main methods of tape jointing. The first is of a temporary nature since the joint can be taken apart and remade without damaging the recorded material, and the second is permanent jointing, so called since once the joint has been made there is no method of taking it apart.

Temporary Jointing

For this type of jointing the accessories required are shown in fig. 1.

(a) The editing block, which is made of metal alloy, is channelled to the width of the standard tape, this channel having slightly overhanging edges to hold the tape firmly in position during cutting.

(b) The cut itself is made with a single-edged razor blade, which is guided by the 45° cutting slot in the editing block. Care should be taken to prevent the razor blade becoming magnetised, since this could cause a noisy joint.

(c) The jointing tape is of a special “hard” adhesive type, which does not ooze under pressure.

(d) For marking the tape whilst editing, a soft wax chinagraph pencil is used, yellow in colour, since this shows up most clearly.

(e) Finally, French chalk—a light dusting of which prevents any tendency to stickiness of the tape joints.

For the purpose of describing the making of a temporary joint, I am going to assume that the tape has broken and that the break is a simple one, i.e. a clean break where the two ends match. First ensure that the two ends to be jointed are clean, since any foreign matter on the tape will affect the adhesive properties of the jointing tape.

The two ends to be jointed should be butted together in the editing block with the uncoated (glossy) side uppermost. Next cut off about an inch of jointing tape, taking great care not to handle the adhesive side more than necessary, and place it over the break. Then smooth out firmly, ensuring that it does not overlap the outer edges. Lightly dust the joint with French chalk, and then run the tape between the thumb and forefinger to remove any excess. No gap should be visible between the two ends, and on playback the joint should not be audible.

More difficult joints

The break described here has been a clean one, where the recorded material has been unaffected, but consider the case where the tape has broken and damage such as fraying of the ends, buckling, crimping or “bootlacing” (extreme stretching of the tape) may have occurred. In these circumstances, it is obvious that some cutting of the tape, resulting in loss of recorded material, will have to be effected.

First, a “makeshift” joint is called for—one in which as much of the tape as possible is preserved. Trim each end of the tape as close to the damaged portions as possible. (This can be done by overlapping the two ends in the editing block over the 45°

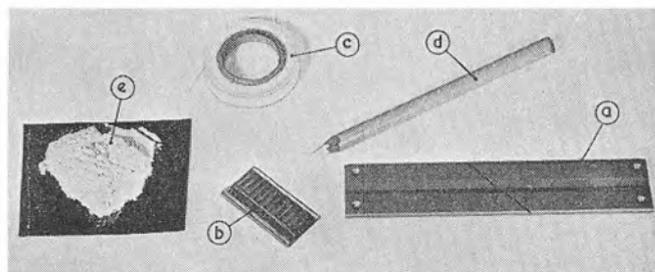


Fig. 1. The essential accessories for editing your tapes.

cutting slot and then, holding the razor blade at a vertical angle of about 30°, cut through both pieces simultaneously, remove the unwanted pieces and joint the tape as described before.)

The tape can now be played for selection of the editing points. The method used to find the exact cutting point will depend on the type of machine being used. If the machine is of the type on which the motors and amplifier are switched simultaneously, i.e. on one switch, then to find the cutting point the tape should be played and stopped as near to the selected point as possible by use of the “Pause” control. (This control enables you to stop the tape by applying braking to the feed spool and removing pressure from the rubber pinch wheel—the amplifier and motor or motors remaining switched on.) To find and mark the exact cutting point, the tape should be moved *backwards* and *forwards* by hand, with the pause control still operated. The obvious marking point is, of course, the centre of the replay head but due to the construction of the tape deck (moulded covers, etc.) access to the head may not be possible. If such is the case, then an off-set marking method is necessary and this I shall describe in detail later.

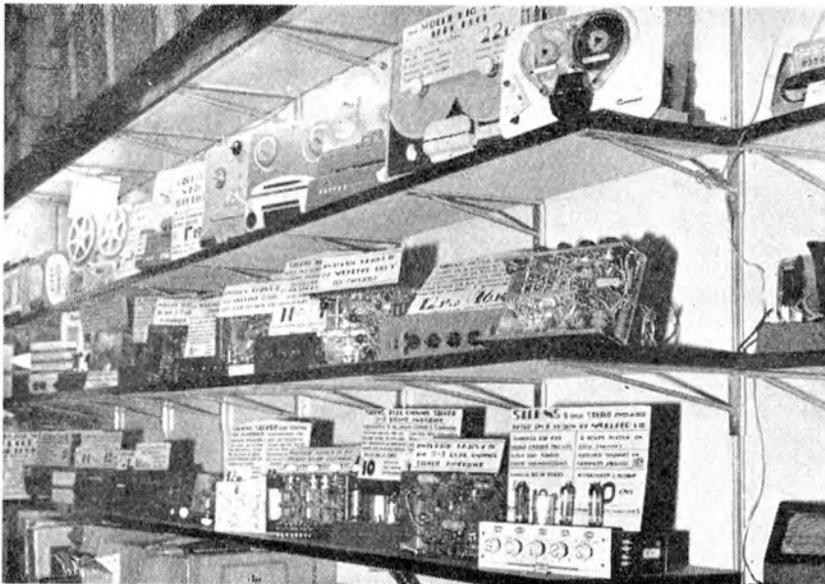
When using a machine on which the amplifier functions and the motors are switched separately, another method of locating the cutting point can be used. Since the functions are switched separately, by selecting “Replay” on the amplifier function switch, it is possible to pull the tape across the heads (the motors in the “Stop” position) and still be able to hear the recorded material. To avoid wear and tear on the brakes, about eighteen inches of tape should be slackened off from both the feed and the take-up spools.

Off-set Marking

I explained earlier that the obvious point to mark the tape is, of course, the centre of the replay head. Assuming that the replay head is not readily accessible due to the construction of the deck covers, then some arbitrary marking point must be made further along the tape at some more accessible point.

On all tape recorders there are guide pillars to the left and right of the head assembly, and either of these provides a good marking point. The distance between this marking point and the centre of the replay head should be carefully measured. This can be done by removing the top cover to make the face of the head accessible. Then having loaded a tape on the machine, mark it, first at the centre of the replay head and then at the guide pillar you have chosen as your marking point. Place the mark made at the centre of the replay head over the 45° cutting slot of your editing block and make a permanent mark on the block to correspond with the other mark on the tape.

When using the off-set marking method, the mark on the tape is placed over the reference mark embossed on the editing block and the cutting point will then automatically be in position over the 45° cutting slot. In the next article I shall be dealing with the permanent jointing of tape by the solvent welding and the universal compound methods.



HERE, THERE AND EVERYWHERE

We took this photograph in the Fleet Street Showrooms of Stern Radio Ltd., London. It demonstrates the thoroughness with which Stern have tackled the important business of supplying tape amplifiers to operate with the various tape decks. The top shelf carries a range of all the popular decks, and on the other two shelves can be seen a wide choice of amplifiers. A speciality of Stern Radio is to supply the full kit of components for all the Mullard circuits. They have built up this facility in consultation with Mullards and, in addition to supplying these kits, they have skilled engineers continually constructing ready-built Mullard units. Although not shown in this photograph, Stern also do a roaring trade in deck plus amplifier assemblies.

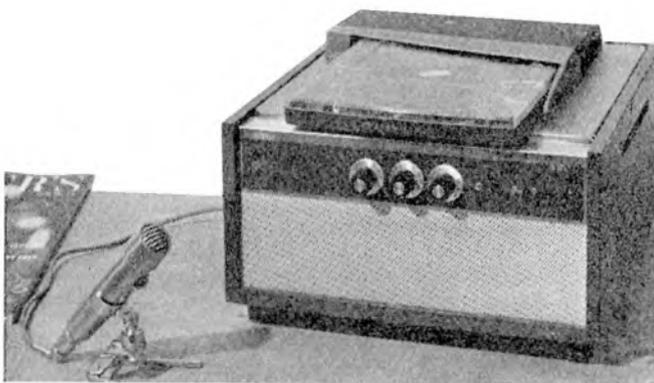
Drama Students Tape Contest

THE second tape recording contest open to members of the National Union of Students Drama Association this year attracted an interesting crop of entries. Tapes submitted were of original material with both music and dialogue written by the group concerned. Entries were judged by Bryan Izzard of the B.B.C. Drama Department who awarded first prize to Dudley Training College; Leeds University was the runner up, and third place was taken by the University College of North Staffordshire.

The first prize, a Grundig TK 20 tape recorder and G.M.U. 3 mixer unit, was received by a representative of Dudley Training College on behalf of Jeffrey Reynolds, who submitted the winning tape. Peter Hudson, Secretary of the Leeds University Union Theatre Group was presented with the second prize, a Grundig G.M.U. 3 mixer unit, and a dozen boxes of Grundig long play tape, and the third prize a dozen boxes of Grundig long play tape, was received on behalf of University College, North Staffordshire.

The standard of recording among the leading entries was extremely high, and originality and ingenuity were shown in the composition of the tapes, echoing the highly professional performances given by the member universities in the live theatre throughout the Festival.

* * *



Moodmaster Press Show

THE Moodmaster system of tape background music has a daily audience of millions in America, where it is heard almost everywhere that the public is found during working or leisure hours—in hotels, restaurants, fashion and hairdressing saloons,

offices, factories, shops, railway stations, supermarkets, dentists' waiting rooms, hospitals, banks—the list is almost never ending. As we intimated on page 544 in our December, 1960 issue, the Moodmaster system of tape playback and amplifying machines and a music library of more than 20,000 playing hours of tape music has now been introduced to this country by Moodmaster (Great Britain) Ltd., 6 Cadogan Lane, London, S.W.1.

We were invited to a Press demonstration on the 12th January, and can confirm that the system is extremely flexible in use, and child's play to operate. The player, plus two loudspeakers, may be obtained for an average rental of 30s. per week. This includes installation, a supply of tape cassettes which are exchanged at regular intervals, and such maintenance as may be necessary.

* * *

The British Photographic Industry

"NEARLY two-thirds of the photographic goods sold in the United Kingdom during 1960 were British-made products" said Mr. A. J. Pincombe in a speech made on his re-election as President of the British Photographic Manufacturers Association. Consumer expenditure on photographic goods in this country during 1960 reached £45m. which was a considerable increase on 1959 despite the bad weather.

Mr. Pincombe stated that one of the most impressive things about photographic sales in 1960 was the rapid increase in popularity of home movie equipment, which is actually showing the biggest percentage increase in sales of any one section of photography.

* * *

Reflectograph Tape Recorders—Price Increase

AS a result of the recent National Engineering Award, Multi-music Limited announce that they have no alternative but to increase the price of their Reflectograph tape recorders. Whilst all orders already received will be executed at existing prices, retail prices of new orders will be—Model 'A' 105 guineas, Model 'B' 115 guineas. There is no reduction in trade discounts, and these will be maintained at the same level as before, which is believed to exceed those given for other professional equipment.

* * *

Teach-U Tapes

A NEW tape venture to be launched this month has the title of *Teach-U Tapes*. A sample was submitted for a preliminary review some weeks ago, and the recorded content was found to be (a) most unusual and (b) potentially very interesting. It was the first of a series of intimate, personal talks, designed to teach the listener/student how to get more out of life. Perhaps that sounds a bit basic—or perhaps it will sound even pompous

HERE, THERE AND EVERYWHERE

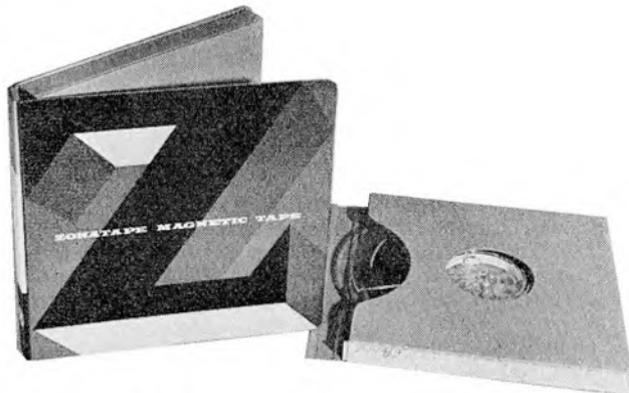
to some; but without doubt there was a wealth of horse-sense and sound instruction in what we listened to.

We have listened to many recorded tapes during the past twelve months. There have been language courses—some very good, some poor, and some with good material ruined by inferior recording. There have been tapes designed to induce sleep, tapes on psychology, and of course tapes of recorded music. Of these ventures, past, current and still to come, some have doubtless been inspired by the new medium itself, but most of them have indirectly pointed the way towards a much wider use of tape recorders than is at present generally envisaged. This latest venture has, basically, "got something" in its idea. The plan is to take in quite a large field of subjects in which "instruction by tape" can be of use. These tapes have one additional and important merit: they are well recorded. Readers who are interested may write for fuller details to: Mr. Sandy, KLP Film Services, 3 Queens Crescent, Richmond, Surrey.

* * * Zonal enter the Tape Field

ONE usually has some warning of a new product on the way. Most often it is a bright and compelling leaflet: at least it is a confidential whisper through the grapevine. Not so with Zonal. Plonk! A parcel arrived on the editorial desk. Two 7-inch spools of tape, each accompanied by a recorded pen-tracing. At first we thought they contained a sound-recording for appraisal, so we telephoned. "No. There's nothing on them. They are the first samples of our new tape. We have just gone into production. We thought you would be interested."

Well, well! This is indeed news. A new brand of tape on the market. With Zonal, of course, it seems to be a logical step. As our readers know well, and particularly our readers with cine



interests, this firm has long specialised in film striping—both for the film industry and the amateur. You send them your silent epic, and within a week you receive it back with an accurately laid magnetic oxide stripe along its entire length. Many of the multi-dimensional sound films that you have enjoyed in your local cinema have been through the Zonal process. So, when it comes to producing perfect oxide films on plastic bases, Zonal should know most of the answers.

The samples we received were of "Standard" thickness. We have forwarded them to one of our technical advisers for test; but in normal use they yielded good results. The coating looked good, and smooth, and the tapes were very well finished. The photograph shows the attractively designed packing.



Armand Denis, the famous photographer and expert on wild life, is seen persuading a *Myrmecophaga tridactyla* (South American Giant Ant Eater) to make a recording. The photograph was taken at his house in Nairobi where he has an animal farm. He has, in fact, six Fi-cord tape recorders and uses them for all recording work on his latest series of TV programmes called "Animal Land". (See also front cover picture.)

NEWS FROM THE WORLD OF TAPE

Tape Recording Course

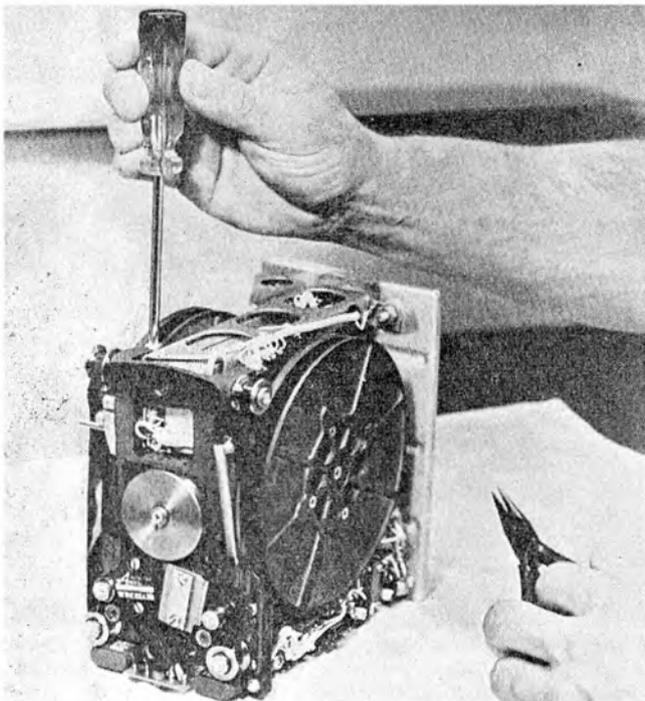
THE Fourth National Tape Recording Course will be held at the Rose Bruford Training College, Lamorbey Park, Sidcup, Kent, from April 10th to 15th, 1961. There will be thorough training in the basic techniques of tape recording, and programme exercises in drama production, magazines, including interviewing with battery recorders, and music. Tutors will include Jack Singleton, Daphne Oram, Sam Wheatley, Desmond Briscoe, Graham Jones, John Borwick, Richard Burwood and F. C. Judd. The course has been devised again by Geoffrey Hodson. Full details from the Special Courses Organiser at the College.

* * *

Tape into Space

WHIZZING through space at 20,000 miles per hour, magnetic tape carried by Courier 1B is recording over 3½ million words a day in the U.S. Army's "delayed repeater" communications satellite experiment. Circling the earth 14 times daily, Courier stores information on a sturdily constructed magnetic tape until commanded to transmit. When in range of a ground station at either Puerto Rico or Fort Monmouth, N.J., Courier can receive 340,000 words in a five-minute period. Five tape recorders in the satellite store this information which is later relayed to the next station.

As the satellite is intended to orbit for at least a year, the tape in the recorders had to be designed with a relative wear factor five times greater than that of standard tapes. The requirement was for a tape that would stand up under extreme conditions of operating speed, temperature and head-to-tape pressure for a minimum of 10,000 passes across the recording heads. The tape selected by CEC engineers is a heavy duty instrumentation tape produced by Minnesota Mining and Manufacturing Company—"Scotch" Brand No. 199, with a 0.45 mil oxide coating on a 1 mil polyester backing.



The tape "memory" carried in Courier 1B—see story above.



Tape for Proof-reading

ONE of Britain's largest printing houses, McCorquodale & Co. Ltd., has gone over to the dictation machine system of proof reading, which uses equipment based on the tape recorder principle.

The dictation machines in use at McCorquodales are ordinary office models to which have been fitted only one minor modification. The Philips design of the dictation machine allows for instant stopping and starting and the modification provides for a simple switching system so that playback is through earphones instead of through the combined microphone-speaker.

The cost of the dictation machine, including installation, for one reader, including several spare cassettes of tape, would in most cases, be well within the financial scope of the smallest printing houses—under £60.

With the Philips dictation machine, the reader dictates direct from copy and then on the play-back corrects the proof against his own reading. As he does the initial reading, he is free always to decide just what spelling out and special references he, as an experienced reader, considers necessary for the copy he is then handling. Foot pedal control is used for starting, stopping and winding back, and this has been designed to be so critical that the reader can, if necessary, go back over the tape in one-word steps.

Now, once the earphones are on, the proof reader is lost in a world of his own, and it is this concentration that enables accuracy without strain. The installation at McCorquodales was carried out by Mr. Harold Ernberg, principal of the Business Equipment Co., 52 Dorset Street, London, W.1.

B.I.R.S. Lecture Changes

DUE to unavoidable circumstances, a number of changes have had to be made in the series of lectures organised by the University of London Department of Extra Mural Studies in association with the British Institute of Recorded Sound, of which we gave notice in a previous issue.

As a result of these changes, the last two lectures in the series are as follows:—

February 22nd—Recorded Literature and Drama. Lecturer—J. W. Lambert (Literary Editor, The Sunday Times).

March 8th—The Documentation of Records. Lecturer—Geoffrey Cuming (Joint Editor, the World's Encyclopedia of Recorded Music).

Tickets for each lecture may be obtained (2s. 6d. each) from the British Institute of Recorded Sound, 38 Russell Square, W.C.1 (MUSEum 4507).

Blind Students Compete in a Modern World

THE Royal National Institute for the Blind has many ramifications, not the least of which is the College at Bayswater for the training of shorthand typists, audio-typists and telephonists. Started soon after the war, it originally aimed to rehabilitate war-blinded civilians and to equip them to earn a living on an equal footing with fully sighted people. Now any blind person can take a course provided the required standard of education has been reached. Students are required to take the Royal Society of Arts examinations up to intermediate level, and the number of successful candidates compares very favourably with other colleges.

Its success can be judged by this extract from a letter sent to Grundig (Great Britain) Limited from one of its past pupils. Ian Ross became totally blind in middle age after some thirty years on the staff of the *Yorkshire Post*. He took an audio-typist's course on the Grundig Stenorette at the College: "It was there that I was taught to use a Stenorette, subsequently obtaining my present situation with the Leeds Welfare Services Department. It is apparently a huge success from their point of view, and I am competing here with four fully sighted typists. My Chief has expressed complete satisfaction with my work. They feel that if the ability of a blind person with the aid of the valuable Stenorette could be more publicised, employment could be found for many so handicapped persons".

The College, which is residential, is the only one of its kind in the world, and caters for the blind throughout Great Britain and the Commonwealth.



CLUB NEWS

On the 16th January Mr. John Borwick, Technical Editor of *The Tape Recorder*, visited the **Crawley & Sussex Tape Recording Club** and gave a talk illustrated by recordings suggesting how we can learn from professionals. He also gave some advice on choosing a tape recorder for special applications.

During 1960 the Club, in conjunction with the Crawley "Courier," ran a Talent Competition. The entrants were taped over a period of two months, and the recordings were listened to and judged by Brian Johnson. The six best appeared in a live concert, and the winner was awarded a Cup and a £10 prize. Another similar competition is to begin soon and the Secretary, Mr. R. C. Watson, 32 Southgate Drive, Crawley, Sussex, will be interested to hear from anyone who has ideas for this.

* * *

The **Tape Writers Circle**, a non-profit-making medium, linking together writers with an enthusiastic interest in recording has been formed since 1959. The Secretary Mr. F. Warren, 7, Prince Street, Watford, Herts would welcome any members resident in the British Isles. Tapes (3½ i/s) or letters to the above address.

* * *

The **Stevenage Tape and Audio Club** recently received a request to replay a tape to a lady living in Stevenage from the Adelaide Tape Club in Australia. However, the club got in first by recording a message from the person concerned, and sent it to her son who has not heard his mother's voice for ten years. There is a happy ending to the story, as the lady concerned is now emigrating to Australia to join her son in the "outback".

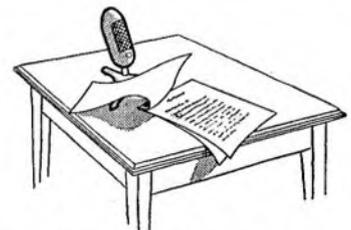
(continued overleaf)

* * *

TAPE TIPS — by Guy

— No. 5—

Use a
Script Rest



IT is better to have nothing on the microphone table other than the microphone and a script rest. The beginner, though very microphone-conscious, will nevertheless apparently forget that he is talking into a microphone and move his head away from the direct line of the latter. If he is reading from a script he will either talk down to the script instead of keeping his head up, or he will try to talk through the script. A suitable script rest is a great help in overcoming this fault but the rest must be low enough not to obscure the microphone.

These tips are abstracted by permission from "How to get the Best out of your Tape Recorder" by Percival J. Guy. Norman Price (Publishers) Ltd. 1958. 8s. 6d. net.



The new Branch of R.E.W. (Earlsfield) Ltd. at 226 Upper Tooting Road, London, S.W.18 stocks almost every available make of Tape Recorder—as we found on a recent visit. The manager, Mr. M. Murray, and his expert salesmen are able to demonstrate and advise on the purchase of any machine or external loudspeaker, and an extensive postal service is maintained.

MORE NEWS FROM THE CLUBS

secretary informs us that he has purchased a Braun Paximat S 35 mm. projector to enable him to add commentaries to his holiday slides. This will also be used at the club to enable them to fall in line with other clubs after the suggestion by John Borwick in the December issue of *The Tape Recorder*. Thirty members have joined in the first year and anyone requiring details should contact Mr. L. V. McGregor, 42, Marymead Drive, Stevenage, Herts.

The **South-West London Tape Recording Society** are pleased and proud to announce that they have now become affiliated to the Central Wandsworth Evening Institute. The Society now functions as a combined club and evening class, meeting on Wednesday nights at Mayfield School, West Hill, S.W.18. This is the first Tape-Recording class ever to be organised by the London County Council, and the Society would like to thank Mr. Geoffrey Hodson, L.C.C. Inspector of Drama, for his interest and co-operation in making this affiliation possible. The future programme of the Society includes talks for beginners to recording, technical construction work, tape drama, tapesponding, documentary, and many other aspects of recording.

Anyone in the area interested in recording is welcomed, and details can be obtained either from the Principal at the address above, or from the Secretary of the Society, Mrs. V. Killick, 6 Disraeli Gardens, Fawe Park Road, S.W.15.

Tom-toms on the North Circular Road! The drums of Africa in London, E.17! These and many other exotic sounds issue forth from a factory tucked away in the industrial heart of Walthamstow as members of the **Walthamstow and District Tape Recording Society** found out recently when they visited the Philips Record works. From the original master tape, the group were shown the processes starting with the cutting of the acetate disc, silvering, "growing" of the nickel press copy, checking and pressing, down to the final packaging. The processing of a disc in stereo made by the Manchester C.W.S. Silver Band was followed by the group step by step through the works, and members were able to hear the final product played before leaving the factory at 12.30 a.m. Secretary Mr. K. Perks of the Tape Recording Society commented, in his thanks to the works manager Mr. Forrest, "The cleanliness of the factory is a factor that has greatly impressed us—that and the efficiency of the operation. Safety precautions abound and ingenious solutions to fuel conservation problems and waste disposal are everywhere to be found." The group of amateur recordists were told of export efforts by the Philips Company in many countries. Particularly

to their liking was the information that discs are cut in their home town for trade in Nigeria. These are mainly of native music, the drums and the beat of the jungle are part of the Philips audio-testers' daily routine. Great satisfaction was expressed by the visitors at the arrangements made, and it is hoped that a further party will attend at a later date. Further details of club meetings can be obtained from Mr. M. R. Dudley, 38, Edward Road, Walthamstow, E.17.

Having finally resigned themselves to the fact that the subject of tape recording is strictly for the specialists, the **Middlesborough Tape Recording Club** have now settled down to specialist interest. The very successful hospital programme "Kaleidoscope" now being replanned for 1961 has been the primary binding force, keeping the production team busy and, more important, together. Stalwarts of the group, convinced that it can attain former glories, decided to prove it, with amazing results. The production was a satirical leg-pull on life in the "Industrial North" called "The Undiscovered Country" or "a social survey that went wrong". Running forty minutes, the tape presents a series of interviews with members of the community of the unnamed Northern town carried out by radio interviewers, one who has travelled up from the civilised Capital and speaks with a hot potato in his mouth. Written by Mr. J. Webb, warden of the Middlesborough Settlement Community Centre, the social survey makes light-hearted fun of the locals—played by the tape club members—investigating the unemployment situation, visits factories, offices etc., and ends with the southern interviewer being stranded on the moors, never again to see the west end. This witty production with its combination of satire, pathos and local colour was well received by the Luncheon Club members at a recent premiere. This was followed by good notices in the local papers. This is the first of several new feature tapes which the new specialists M.T.R.C. are to produce. Two stories have been written and after dramatisation will be taped. The secretary would be pleased to hear from any club (no introductory letter needed) with ideas complementary to their own. Mr. G. W. B. Harrison, 27, Tennyson Street, Middlesbrough, Yorkshire.

The **South Devon Tape Recording Club** met on the 4th January for a lecture and demonstration by Mr. A. S. Heather, of the Torbay School of Art, who brought his Ferrograph and a large selection of personal recordings demonstrating the uses of a tape recorder for gathering items of interest. He concluded his very interesting talk by showing how and how not to make live recordings, and giving advice on the storage of tape. Members were guests of the Torbay Amateur Cine Society on January 16th when Mr. F. Stephens, the chairman, introduced Mr. D. Aldous, who gave a lecture on "Sound and Synchronisation". Slides were shown to illustrate the various methods of synchronising magnetic tape with cine films. Later in the evening, a member demonstrated the K.G.M. Cinecorder, the machine designed for the person wishing to add sound to films. Further meetings have been arranged and details will be sent on request from Miss S. Harris, 123, Sherwell Valley Road, Chelston, Torquay.

The formation of the **Cambridge University Tape Recording Society** has been announced and meetings will be held every Thursday. Visits and lectures have been arranged and further information can be obtained from Mr. S. P. Robinson, Selwyn College, Cambridge.

Hospitals in the Barnsley area have recently been receiving programmes over a land line from the studio of the **Y.M.C.A. and Barnsley District Tape Recording Club**. Over 800 patients



MARCH NUMBER

★

Contents include :

A new amplifier to build yourself

Improving tape manufacture

Understand Hi-Fi—for beginners

★

NOW ON SALE

regularly listen to this new service which appears to have been well planned with the co-operation of the G.P.O. This line has been installed at a cost of only £4 per year. Later in the year, the club are to record a "sound picture" of Barnsley with the view of exchanging it with other clubs throughout the country. All these events take place on the 1st, 3rd and 4th Tuesday of each month with the ordinary club meeting on the 2nd Tuesday. Further details will be sent on request from the Secretary who would like to hear of any new ideas in recording. Letters or tapes (7½ in. × 3¼ in.) should be sent to Mr. E. Clegg, 12, St. Barts Terrace, Park Road, Barnsley. Tel 5558.

Leamington and Warwick Amateur Tape Recording Society will be holding a course in tape recording every first and third Wednesday for the next two months. Meetings are held at the Town Hall, Leamington Spa, at 8 p.m. The syllabus includes "Tapes and how to use your recorder", "Making and editing a programme", and "Future trends in tape recording". Details from Mr. E. Jones, 26, Hampton Street, Leamington Spa.

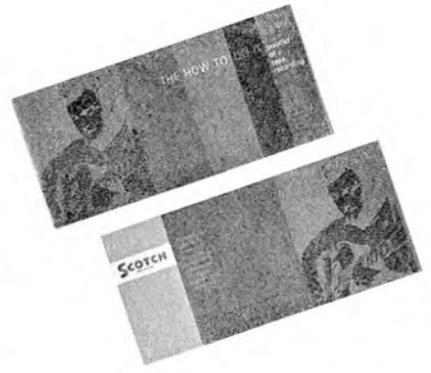
Brixton Tape Recording Club have appointed a new secretary to replace Mr. L. Walker who has been forced to resign due to personal reasons. Mr. Walker has greatly helped the club during the past year and members would like to thank him for all the hard work he has done to ensure that club nights were well organised. The new secretary is Mr. P. Winchester of 5, Rhodesia Road, London, S.W.9, and he will be pleased to supply any reader with details of the club.

The **Enfield and District Tape Club** since its formation last August has, until recently, been meeting in members' homes. However, a short while ago they gained fortnightly possession of a schoolroom, and the fact that they now have larger premises enables them to seek new members. Compared to the front room meetings this class room is a vast hall. Recording enthusiasts in Harringay, Hornsey, Tottenham, Edmonton, Winchmore Hill and several other areas have been contacted by post inviting them to join this club, as there is no other tape recording club in these areas. The room is in Bush Hill Park School, Main Avenue, Bush Hill Park, and meetings are held every fortnight on a Wednesday evening. The next meeting will be on March 1st at 8 p.m. The secretary Mr. R. Collinson would like to hear from anyone interested in joining and they should write to him at 30, Ridler Road, Forty Hill, Enfield, Middlesex.

The most exciting project of the **Hull and District Tape Recording Club** for some time was when a party of 18 members travelled to Manchester to visit the B.B.C. Sound Studios. They arrived in time to see "Question Time" being transmitted in the Home Service. This was watched from the main control room, and members were fascinated by the mobile tape recorders used. From the control room they were conducted to a rehearsal in Studio One with its large floor space, effects corner, and enviable control room. Also to be seen were disc-cutting machines, more portable recorders, racks of tapes and records, and expensive microphones. Then on to the small television studio with its fantastic array of lights, its frightening control room and the video tape equipment. The highlight of the tour was a demonstration, in which members took part, using one of the smaller studios and control room. The technical members were soon au fait with the three tape recorders, the four turntables, the mixing unit and control panel. Several members tried to interview Roger Moffatt but he seemed to be pre-occupied with a weather forecast. After a welcome cup of tea in the canteen, the eighteen members were privileged to be part of the audience at a recording session of the Ken Dodd Show. After the recording Ken Dodd was ambushed in his dressing room by three members who obtained an interview for the club library. Two further interviews have since been added, and it is hoped in the future to waylay Mike and Bernie Winters, Don Arrol, David Whitfield and Joan Hammond. This is just one of the interesting items listed in this newsletter sent out by the secretary. Shortage of space prevents us from including more, but we must congratulate the secretary on his

New "Scotch" Brand Booklet

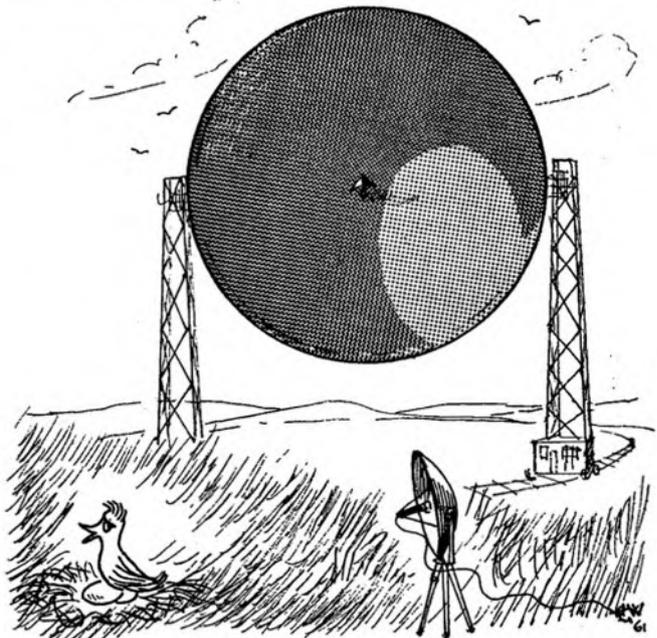
"THE How To Do It Booklet Of Tape Recording," from the makers of "Scotch" Brand Recording Tape, is an attractive new 20-page publication covering many of the problems faced by recording enthusiasts old and new. Sections are included on "How to Care for your Tapes," "How to Thread Tape," "How Tape Tracks Work," "How to Splice" and "How to Edit." The booklet may be obtained by those wishing to increase their knowledge of recording techniques, by writing direct to:—**Minnesota Mining and Manufacturing Co. Ltd., 3M House, Wigmore Street, London, W.1.**



detailed report. Further details from Mr. F. K. Fulstow, 17, Lowfield Road, Anlaby, Hull, E. Yorks.

The **Bedford Tape Group**, just formed, are experimenting with a new type of club without any formal club organisation. Due to the poor response in trying to recruit members, it was decided to devote time to the study and development of the Social, Educational and Personal potentialities of the tape recorder. If any other club would like to hear more of this experimental group, they should contact the secretary Mr. W. Summerfield-Turner, 131, London Road, Bedford.

The **Walsall and District Tape Recording Club's** membership is growing slowly, the latest addition being a Walsall airman stationed in Aden, who learned of the Club's activities through publicity in the local newspaper. An interesting talk was given by the Chairman, Mr. R. Medford, on tape exchange, and some of the ideas he put forward are being carried out in practice by the members who already exchange tapes with the Harrow Club. Further information can be obtained from Mrs. J. Walford, 41, Mill Road, Pelsall, Walsall.



"These do-it-yourself kits will be the death of me . . ."

*—the specialist
show of sound—*

THE INTERNATIONAL 1961

AUDIO FESTIVAL AND FAIR

APRIL 6-7-8-9
11 a.m.—9 p.m.

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As an audio enthusiast you must hear and see for yourself the newest products and latest developments in the audio world. At the International Audio Festival and Fair you will be able to meet and discuss your sound problems with the actual inventors and builders themselves.

Ask at your nearest Audio, Radio, Music or Record Shop for complimentary invitations. Or write direct with s.a.e. to:

THE FESTIVAL DIRECTOR
42 MANCHESTER STREET
LONDON W1

Don't forget—the Audio Show of the year starts Thursday, April 6th and continues over the weekend.

WHY NOT MAKE YOUR TAPE RECORDING PAY?

By C. F. CARR _____ Part 2

ONE new channel of exploitation of advanced tape-recording techniques will be opened up with the expansion of sound radio into the field of local broadcasting. The Pilkington Committee is now sitting to determine the conditions on which it can recommend the Government to act when the present national structure of broadcasting and television is revised in two or three years' time. One thing they have to report on is concerned with the proposed introduction of an extensive chain of local broadcasting stations to serve individual cities and towns. Each station would cover an area of approximately ten miles, serving the exclusive needs of its town, through local news, features of local cultural interest and local sport and entertainment. Whether these stations should broadcast advertising matter is simply a side issue, though admittedly a highly controversial one.

Local interest

If independent stations are allowed to provide the projected new service, they will need corporately a vast intake of localised broadcast material. It is not difficult to suggest lists of features of special appeal to local listeners. Such stations, indeed, will succeed or fail according to the strength of their own creative planning. These needs will create a demand for good quality broadcasting material on tape—matter which can be fed into the station's transmitter with the minimum of editing or other preliminary treatment. This special demand will include not only commentaries with a strong local flavour, but also short documentaries with a similiar appeal and even short regional plays. With the large number of local stations envisaged, this type of demand will be enormous, and it will begin to build up from the moment the first station goes on the air. In every part of Britain today there is a rich store of material for conversion into the type of taped features for which local radio will create an insatiable appetite.

Demand for recordings

An outlet of unlimited volume for the work of literary research specialists, of script-writers, and for all kinds of spoken material already on tape will be created by localised radio. It is quite likely that there will also be network possibilities of some size. Here the creative and artistic standards may be higher. We have already heard what can be done by amateurs working on the right lines from Norman Paul's wonderful tape "The Rest is Silence". This is the kind of work local sound radio will welcome. It provides a formula which is readily convertible to a wide range of local material. It is obvious that a great opportunity is coming for the tape-recorder who has the flair to exploit this new market. The lucky ones will be those who have both the necessary mental equipment and the technical know-how, for they will be able to prepare their own scripts and to put them on tape. But there will be equal chances for partnerships and for teams who can co-operate to produce quality tapes. These may be able to build up their own studios and turn out quite considerable quantities of worth-while work.

If local broadcasting develops on the lines proposed, it will bring new recording openings for the creative amateur as great as those which already exist in the printed media. Here are possibilities which should be closely watched. In TV and radio, they call the studio rehearsal of a feature a "dry run". Tape recordists with an eye—or should one say a mike?—on this new field may well find an interesting winter activity in working out some local ideas on these lines and giving them a "dry run".

By NANCY JAY

PICTURES WITH A PEAL

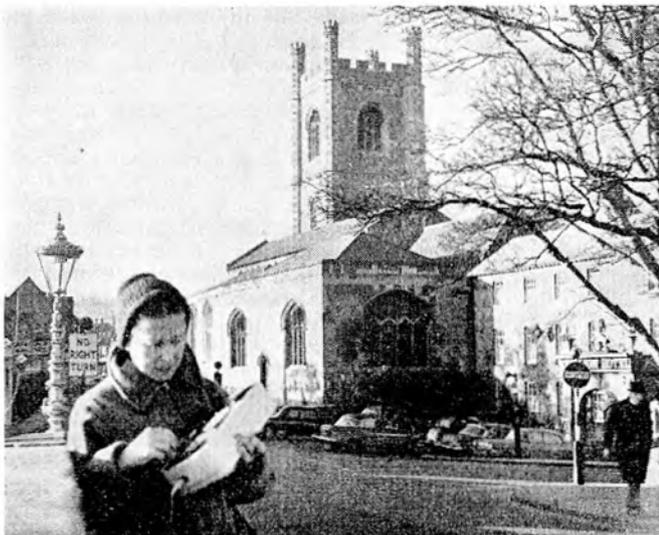
IT'S a couple of years since I first took a tape recorder on holiday as a gesture of protest against my husband's inevitable camera. What began as a competition soon developed into a sound-and-vision partnership which has given us a new kind of hobby that we can both share, and doubled our fun. I can recommend the idea to all long-suffering "camera widows". You don't have to be a sound expert; my only equipment is a pint-sized portable recorder and the maker's instruction book.

Modern cameras make it so easy to take colour transparencies that the bore who insists on showing you his holiday slides has become a music-hall joke. But when you show your slides with the recorded sounds that go with them, your audience won't be making excuses to leave at the first interval—they'll ask for more.

You have to be careful to choose the right subjects. The picture should be something that goes with continuous sounds—e.g. the sound of the waves, crowds, traffic, fair-grounds, birds—to give background and atmosphere. Keep off noises of short duration, such as an isolated car hooter, a crash, splash or bang. Your subject should be still—or at least one that doesn't obviously call for synchronised sound; distant shots rather than close-ups.

An Ideal Subject

One of the best subjects we have found for this "double-barrelled" treatment is a collection of churches and their bells. Most churches—ancient or modern—make good pictures, and there's bound to be one wherever you go, at home or abroad.



Having chosen a time when traffic appears to be at a minimum, the author adds the ringing of the Henley Church bells to her collection.



The author gets her Grundig TK1 Transistor Recorder ready for action within recording distance of the Hughendon Church. This new recorder is described elsewhere in this issue.

And since bell-ringing is a peculiarly English art, nearly all churches in this country have bells, ranging from the single "Come-all-to-church-good-people" type of a whole chime, or even a full-length tune. On the Continent you can tape an immense variety of carillons in the course of a short tour.

A church-and-bells collection can be put together like a string of beads to lend continuity to your recorded holiday. And, of course, you can include any building that has a chime. One tour that took in Southampton, for instance, included shots of the Civic Centre and campanile with a recording of the bells playing "O God Our Help In Ages Past" (Isaac Watts, who wrote it, was born there). A ship's siren helped to set the scene and prompted us to add some shots of the George V graving dock.

Before actually getting down to recording, find out all you can about the church you have chosen. Nearly every one has its own printed guide, but if it hasn't, look up the local guide book, a touring gazetteer or an encyclopedia. Talk to the vicar, or the vergier, or the chief bell-ringer and remember in any case to ask permission before starting operations inside the building. Don't swallow everything the Oldest Inhabitant or the man on the corner tells you. We were led astray in this way by a carpenter working on a church in Perth, but, looking back, his bit of verbal embroidery on the church's history was worth recording for the sake of his ripe Scots accent. So go to the proper source for your facts, but don't rule out the locals for a spot of colour—you can always scrub it later if you don't want it.

It always makes useful material for your taped comments if the bells have any associations with famous people. (Perhaps they rang a message of encouragement to some local Dick Whittington, kept King Charles II awake or gave Dorothy L. Sayers an idea for a story.) And find out the best time for hearing the bells and the name of what they will be playing—e.g. simple changes, a hymn tune, or a Treble Bob Major. (By the way, all bell-ringers are enthusiasts; if you go to one for your information you must expect a lecture on campanology in order to learn a few useful facts.)

Collecting the Raw Material

There's no need to make your sound record and picture at the same time. Bells for Evensong on a winter afternoon wouldn't go with enough light for a picture even at the biggest

(Continued overleaf)

bi*Tapes***NEW****QUALITY
PRE-RECORDINGS****BACKGROUND &
MOOD MUSIC****TRAD JAZZ****MODERN JAZZ****LATIN AMERICAN****PIANO POPS &
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LONDON, W.1****HUNTER 2877****PICTURES WITH A PEAL—(continued)**

stop on your camera. But there's nothing to stop you from taking the picture earlier in the day when the lighting is best for your chosen angle.

The other member of the firm should know enough about his job to use a viewpoint that will isolate the church as much as possible from its surroundings, and exclude any moving figures. You, too, must be selective before switching to record. Remember that you are apt to hear just what you're listening for and ignore all sorts of intrusions that you notice only on playback. This is as good a reason as any for always checking what you've recorded on the spot before you move on; you can usually have another go at a quieter time of the day.

Where to record

If you want to record in a town, choose a site where the church is screened as far as possible from the traffic and other distracting noises like road drills, car hooters and so on. On the other hand, if it's a market town clock or church you're recording, a few stray moos and baas among the chimes will help the atmosphere.

Watch out for echoes off nearby buildings, and remember that bells—like all other percussion sound sources—are prone to distortion from over-recording. We find, too, that recording bells inside the church isn't successful; there are too many echoes and, where the ringing is done mechanically, you pick up the whirr of the mechanism. (Another thing—there are often workmen busy in the church during the day. Our recording made in York Minster is outstanding chiefly for its Anvil Chorus effect, but unfortunately we weren't collecting that sort of hammer.)

You'll get better results if you record away from the building—"Bells Across The Meadow" is the right idea—where you'll be less likely to pick up unwanted noises. The odd thrush or blackbird chiming in won't do any harm, but keep the microphone screened from the wind and well clear of your clothing and the machine itself.

Tailoring The Tape

When you have collected enough raw material, the first job is to make a list of everything you have recorded and photographed, and to label tapes and slides. Then you can tackle the first stage in marrying the sound and vision. Start by selecting the best sections of tape to match the best slides, including any pictures other than churches which add something to the programme.

Allow about 20 seconds for each slide. This will give you the total length of your bell record and any comments you want to add. You will have to give the name and place of the church, and you can also add any brief, interesting facts connected with it. But don't overdo it.

You can use the "cut and splice" method to make up your slide tape, recording your commentary on bits of tape and joining them in as required, but there are two things against it: you can't fade the bells in and out, and you have to sacrifice the second track on the tape. You can avoid both these drawbacks by borrowing a second machine and dubbing all the bell bits on to a duplicate tape with your commentary recorded direct on to the same tape. Whichever method you use, be careful to dub all your records at the same volume level; the less knob-twiddling you have to do in semi-darkness the better.

Record a click or a single "dong!" to cue the tape at the beginning and end of each record to indicate when to change slides. You can use the pause control to hold up the tape if you want to keep a particular slide on the screen past its allotted time, but it is better to let the tape run from start to finish without interruption and let it dictate the showing time of the slides.

Recording bells, like charity, should begin at home, so put in a bit of practice with a visit to your own parish church to start your collection. But whatever the scope of your final programme, whether you go in for recording famous cathedrals or country churches, you will find that a slide show on these lines really does "ring the bell".

By James Moir

REVIEWING TAPE RECORDERS

PART SEVEN ————— MECHANICAL NOISE

IF you are a critical listener, you may be annoyed by the mechanical noise made by your tape recorder or gramophone turntable, a point that several correspondents have raised during the last couple of years.

There is certainly no merit in having recordings with a signal/noise ratio of 50 dB, and a machine with a similar electrical performance, if the mechanical noise radiated directly by the mechanism results in an overall acoustical signal/noise ratio of only about 30 dB. The signal/noise ratio that is effective as far as the listener is concerned is that existing at the ears, and not that of the tape and electronics alone. Many domestic machines certainly produce sufficient mechanical noise to be annoying during quiet passages in the reproduced music. For this reason, it was decided to include a machine noise test in future *Tape Recorder* reviews.

This is not quite so easy as it may sound, for mechanical noise level is a difficult thing to measure if a true indication of the loudness is to be given. A measurement of sound intensity is not particularly difficult, but loudness as judged by an individual is not directly related to the sound intensity (i.e. the acoustic power in the sound). Where the sound to be measured contains several components of different frequencies, the problem of measuring the loudness is particularly difficult.

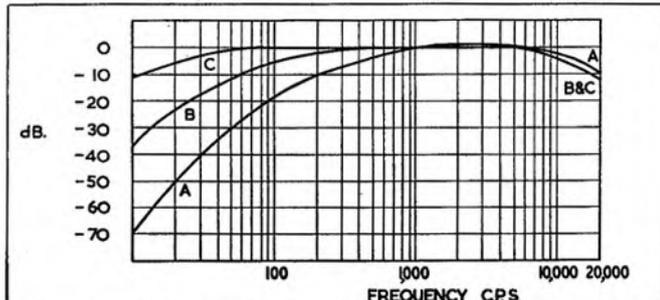


Fig. 1 Loudness meter curves for A below 55 dB, B 55 to 85 dB, C over 85 dB.

Noise from a tape recorder is of this kind, for it will usually contain components at twice the main frequency, plus other components due to motor fan blades, bearings, tape flaps, tape rub and spool rotation.

The frequency response of the ear varies with the intensity of the sound presented to it, and thus any meter that purports to indicate the loudness of a complex sound must have some means of adjusting its frequency response to match the loudness of the sound being measured. These requirements are well met by most of the commercial sound level meters, but there is an additional complication that has so far defied a solution. A listener's reaction to a sound is not directly related to its intensity or even its loudness, but to the annoyance which he experiences when the unwanted sound is present together with other sounds which he wishes to enjoy. Annoyance is something which no sound level meter yet developed will evaluate. Nor will any sound level meter give an accurate indication of the relative loudness of two sounds that differ widely in frequency spectrum. Thus two such dissimilar sounds as a telephone bell and a motor cycle engine, known to be of the same loudness in a particular location, would be unlikely



The sound level meter used by the author is the Dawe Instruments Type 1400E.

to produce equal readings on any sound level meter now available.

This discussion may appear to be a condemnation of all sound level meters, but rather it should be interpreted as a warning to exercise care in their use. Given this consideration, and an understanding of their limitations, sound level meters are extremely valuable devices and are in widespread use.

A sound level meter is basically a combination of a microphone, amplifier and meter, but this simple statement overlooks the tremendous amount of development that has been necessary

The meter

to produce a reliable and consistent device. Special care is necessary in choosing the microphone, for it must not overload on intense sounds, must have a uniform frequency response and polar diagram, a high sensitivity, be immune to stray magnetism and electrostatic fields and maintain these characteristics over long periods. The amplifier would appear to be a straightforward problem but, in fact, amplifiers having adequate gain, and a noise level sufficiently low to allow loudness measurements near the ears' threshold, are not yet available. In consequence there are few sound level meters that will measure sound intensities below about 20 dB above our reference of 10^{-16} watts/sq. cm. Thus the hearing system is about 16 dB more sensitive than the best sound level meter. The indicating instrument itself must have special dynamic characteristics if it is to simulate the ear, but at least meters having an approximation to the desired characteristics are available.

It has been mentioned that the frequency response of the ear varies with the loudness of the sounds presented to it. A standard sound level meter approximates this performance by including three response curves corresponding to the performance of the hearing system at loudness levels of 55 dB, 85 dB and 100 dB, and requiring the operator to make the appropriate choice of response curve for each loudness measurement. The curves corresponding to these loudness levels are shown in fig. 1. There can be no sharp line of demarcation between the choice of one or other of the weighting networks when making a measurement of sound level, and in consequence any loudness measurement should always be accompanied by an indication of the weighting network used. This is a precaution that is particularly necessary when the loudness level is near 55, 80 or 100 dB, or when the sound being measured consists of many components. A sound having prominent low frequency components would obviously give widely different readings on the A and B weightings, for use of the A (55 dB) weighting network would remove most of

(Continued on page 77)

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REVIEWING TAPE RECORDERS—(continued)

the low frequency components before they reached the meter, whereas the whole spectrum would be passed by the C weighting network. Tape recorders generally produce sound levels in the region of 30-40 dB, so that all readings are taken with the A scale in use.

The sound level meter used by the writer is the Dawe Type 1400E meter, a compact, robust, transistorised instrument having many years of development behind it. There are only two

Table 1

	Typical Noise Level
Very quiet house in country	26-30 dB
Detached house, quiet residential area	32 dB
Semi-detached house, quiet residential area	34 dB
House in side street, through traffic	38-42 dB
House in main street, through traffic	40-48 dB

switches to manipulate when taking a reading, the A, B, C weighting network selector (combined with a battery voltage checking position) and a ten-position attenuator reading from 20 dB to 130 dB. Readings of sound level are taken by rotating this switch from the 130 dB point until a reading can be taken from the meter. The appropriate weighting network is then selected by the right hand switch, and the meter reading added to the attenuator setting to give the sound level. Four jack sockets are fitted to allow the meter to be used for more sophisticated work, but they need not concern us when we are interested in measuring sound levels of one particular kind.

Interpreting the results

Possession of a suitable meter is half the battle, but care in the interpretation of the readings is the other half. When a tape recorder is used in an ordinary domestic living room, the noise emitted by the motor, gears, flywheel, mains transformer, etc., is multiply reflected by the walls of the room, and this may well increase the sound level by a factor of ten times when compared to the same recorder operated in a completely reflection-free room. If such a room is not available, and they cost about £10,000 for construction and acoustic treatment, then special care is necessary in making any measurement. The convenient procedure is to choose a room containing as much absorption as possible, and to standardise the relative positions of tape recorder, measuring microphone and the room walls. While this can be quite satisfactory in allowing tape recorders to be compared, it prevents the results of the measurements being treated as absolute, and makes it necessary to use care in comparing the readings with similar measurements in any other location.

Preliminary measurements seem to indicate that a microphone placed about two feet from the recorder under test gives consistent and meaningful results. Noise from a recorder contains many components of different frequencies. The low frequency components are radiated uniformly in all directions, but the high frequency noise components are very directional. Thus the sound level may vary according to the position of the measuring microphone with respect to the machine, even though it is kept at a fixed distance from the recorder. This spacial variation can only be eliminated by taking several readings and using the average, and this value is the figure quoted in Test Reports.

Nuisance value

While the quoted values can be used for comparing different machines, it would be advantageous if the figures could also be used as a guide to the subjectively judged "noisiness" of the machine when it is used in your own home. This can be done, but it requires considerable care. Noise from any source is only objectionable when it can be heard above the general background, and thus a machine may be judged as "very

quiet" in one location and "very noisy" in another and quieter location. Whether you will consider it noisy depends upon the noise in your room.

Typical values for the background noise level in domestic conditions are quoted in Table 1. Average values range around 38-45 dB, but a quiet house out in the country away from main roads and not on an aircraft route may well have a noise level in the region of 25 dB, falling below 20 dB in the late evening. This residual noise is produced by such things as the electric clock, the buzzing of a choke for a fluorescent lamp, or merely the flames from a coal fire. An electric kettle boiling in the kitchen twenty feet away (door open) then appears to be very noisy.

Domestic levels

A detached house in a residential area and facing a street will have evening noise levels between 30 and 35 dB, a few more dB being added if the house is semi-detached, though outdoor noises are still the major part of the indoor background. If one lives in a flat, the noise level will rise to the 38-45 dB level, but the major source of background will then be the noise created in neighbouring flats unless you live in a ground floor flat on a busy street.

Some tests in my own very quiet living room appear to show that a critical listener will begin to comment on the noise made by a tape recorder when the level is perhaps a couple of dB below the general background, and will think it noisy when it is 6-8 dB above. A non-critical listener will not comment until the noise level from the machine is about 6 dB above background, and will not criticise until it is about 10 dB above. It is reasonable to assume that all readers of *The Tape Recorder* are critical listeners, and are likely to notice the noise from a machine when it is about the same as the general background. As Table 1 shows, this may well vary over a range of 25 dB, and thus your own particular circumstances must be kept in mind when interpreting the noise levels quoted in a Tape Recorder review. The relative "noiseiness" of machines can be directly judged from the test report figures. **James Moir**

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THE TAPE RECORDER

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By D. A. Hill

SCHOOL IN THE NEWS!

meet the S.C.R.U.

IT is some years now since a group of Old Scholars of St. Christopher in Letchworth presented the school with a Grundig T.K.5. As Senior French Teacher I welcomed this new addition to our "teaching aids", and have since made extensive use of it in my department.

However it was not until a technically-minded enthusiast, Christopher Mayo, joined the staff, that a second tape-recording ambition was realised: together we founded a Tape Recording



Two of the boys are seen using the Ferrograph recorder and Grampian microphone for an interview with an ambulance driver in a Home Safety programme.

Club, which quickly turned into the St. Christopher Recording Unit (now familiarly known as "SCRU"). The change of name reflected our aims, for we felt from the start that we wanted, not a group of boys and girls messing about with tape recorders, nor even a club just recording school activities (though we do include these), but a group of enthusiasts planning, interviewing, recording, editing, in fact tackling all the many sides of recording which go to build real programmes.

Requirements

This meant, of course, that from the start we needed not only at least one reliable, high quality recorder as our mainstay, but also a highly portable machine which could be taken anywhere. The first task of our members was therefore to make some money fast. We set to work at once collecting scrap paper, old woollens and books, and in a remarkably short time the sale of all these, together with our small subscription, enabled us to buy a second-hand Ferrograph 2A which has served us excellently; not long after we were also able to buy a second-hand Fi-Cord, which has proved ideal for the job. Now we are approaching the moment when we can consider the purchase of a second Ferrograph to speed up our editing.

As soon as we started, we contacted our five local hospitals

and offered a recording service for patients to enable them to send recordings free of all charge, except postage, to anywhere in the world; the work of this service has now been taken over by the recently-formed North Herts Tape Recording Club. Our second step was to get in touch with the local Blind Club, to whom we offered recordings of books and poems. This Christmas our members entertained them at their Christmas party with games played with the use of the tape recorder, and with recordings we have made over the past six months.

It was our contact with the Blind Club that led us to start our local Magazine Programmes, which have become the main effort of our outside recording teams. For our first Magazine we took as our theme the development of our home town of Letchworth, which is expanding rapidly with the move of industries from London. We interviewed the mayor, town councillors, town planners, architects, shopkeepers, archaeologists and other leading personalities in the town.

Local news

The second half of this programme was devoted to an investigation into the attitude of local townspeople to the Youth of Today. This time we went out and recorded the views of local headmasters, youth leaders, town councillors and members of local youth clubs, ending up with a day spent interviewing passers-by in the main street of the town; this part of our efforts was filmed by a B.B.C. television unit, and soon after we appeared on the "To-Night" programme.

Our second Magazine was concerned with local events this last summer and included a Traction Engine Rally, a Batt'e of Britain Air Show, a Veteran Car Rally and a helicopter ride, as well as the local Beating of the Bounds ceremony; the latter, recorded and edited by one of our young members, Christopher



A play-reading run-through in progress. The microphone is a Reslo ribbon type, with "dead" angle towards the recorder.



The St. Christopher Recording Unit has appeared more than once in B.B.C. programmes. The above photograph shows a camera team from the "Tonight" programme being directed by Jack Gold (extreme right). The boys and girls were in the process of making a series of outdoor recordings in front of the school, and it was the various scripted and unscripted recording operations which formed the basis of this part of that "Tonight" programme. On another occasion the B.B.C. Sound programme "Town and Country" accepted one of the unit's magazine tapes for transmission on the Home Service.

King, was accepted by the B.B.C. and put over the air in their "Town and Country" programme. All these interviews and recordings were, of course, done by the boys and girls of our school. Our incidental music was composed by our Senior Music Teacher, Austin O'Neill.

Passers-by

With the recent take-over bids for Letchworth's First Garden City Limited arousing country-wide interest, we immediately went into action interviewing passers-by once again, and securing interviews with representatives of a number of the interested parties. We have handed over recordings of the most important statements made, and of local public meetings, to the local museum for filing in the permanent records of the town. This has led us to start on a round of recordings of the reminiscences of some of the founder members of this first Garden City, which will also be added to the archives.

Clearly the possibilities of the tape recorder in the realm of "actuality" are endless, and I am sure that we shall never run out of this kind of material.

The Iron Curtain

As a school we have also been anxious to link up with other boys and girls all over the world; we have recently sent our first tape to a school in Moscow, and have heard that it arrived safely and was much appreciated; we are also exchanging tapes regularly with a school in Western Germany. Unfortunately the tape recorder is still not very widely used in schools on the continent, so that up to the time of writing we have had no luck with France; we are, however, hoping to form a link with a school in Africa. Our tapes to those countries, which represent the main foreign languages taught in our school, serve a double purpose: one part is always in the foreign language on some aspect of life in England which would be of interest to the whole school; the rest is in English and is designed to be used in class by the English teacher, for it includes stories and poems, and, for the older pupils, extracts from English literature. with a

special eye on set books. Here again the possibilities are endless and exciting.

We have many plans for the future: high on the list comes the development of a drama section, which will launch us on the complexities of mixing incidental music and sound effects, and which will certainly test our technically-minded members to the full. We also want to record more live music, including choral and operatic work, and we hope that this will lead us in the end to stereo. With two members who have already built their own machines and with all the enthusiasm and hard work which have brought us so far, I have an idea that we shall achieve all this and more.

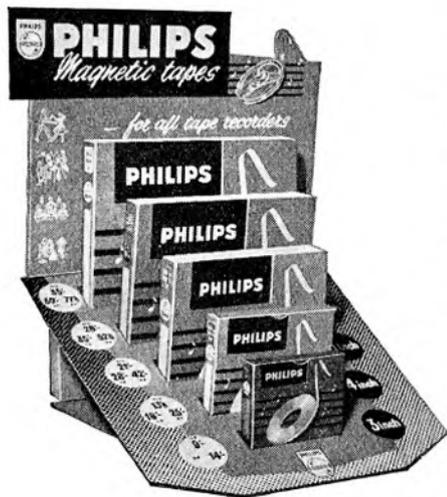
School work not forgotten

In case you are wondering when our boys and girls find the time to do any school work, I ought to make it quite clear that we limit our target for each term and distribute the work among our numerous members. There can be no doubt that the work of the Unit is a wonderful education. Quite apart from the technical side which is pursued in considerable detail by some of our more scientifically-minded members, there are innumerable opportunities to go out and meet people from all walks of life, in their homes, at work, in the countryside and in the street. Add to this our links abroad and the work we are doing for others less fortunate than ourselves, and you have an intensely interesting and highly valuable piece of character training: what more could you ask of a school club?

Editorial Note

WE congratulate the S.C.R.U. on a list of first-rate recording achievements to date, and feel sure that many more interesting recordings will come from their efforts. As readers who remember our features on the Rochester School activities will know, we are always extremely interested to hear of group tape recording activities of this kind. If you belong to such a group and can supply pictures, plus story, we shall be glad to consider them for publication.

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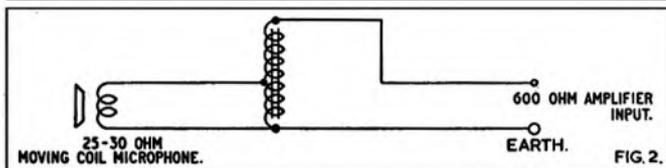
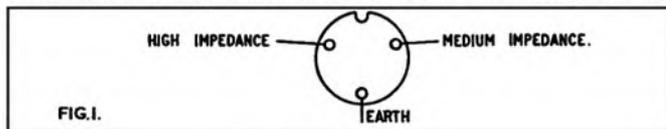
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By A. Tutchings

BUILD THIS REALLY PORTABLE RECORDER

PART 4 — MICROPHONES AND MATCHING

THE choice of a suitable microphone for the portable recorder is very important, as the final sound quality depends almost entirely on the response and output of the microphone. The design of the transistor amplifier is based on a microphone with an impedance of 600 ohms and an output of 0.25 millivolts for normal speech at 6 inches from the microphone. The impedance can vary from about 200 ohms to 1,000 ohms with little affect on performance if the voltage output is adequate. The Gramian DP4M and the Lustraphone LFV/59M stick microphones are very suitable for portable recorder use, and are issued as standard equipment with many such instruments. The Telefunken D11B, recently reviewed in this magazine, is also very suitable if the medium impedance output is used. This brings up the



Continental 3-pin plug (above) Home-made for which winding instructions are given this month matching transformer (below).

point that many continental microphones are fitted with a tapped output transformer which makes available both a high impedance output, for direct connection to a valve grid, and a medium impedance, which is suitable for feeding transistor circuits. Standard continental 3-pin plugs are fitted and the pin connections, looking up into the plug, are as shown in fig. 1.

Matching Low Impedance Microphones

Most professional moving-coil microphones, and many home microphones sold a few years ago, had impedances of 20 to 30 ohms. To make these microphones suitable for use with this portable recorder, a matching transformer is required with a turns ratio of 5 to 1. The total number of turns on such a transformer is quite low, and winding can be undertaken by the home constructor with no special winding equipment. Mu-metal laminations must be used, and these are usually identified by the blue insulating paint on one side of the laminations.

A convenient size of lamination gives a stack measuring 1 in. by $\frac{1}{2}$ in. by $\frac{1}{4}$ in., and for such a core a total winding of 750 turns tapped at 150 turns gives adequate inductance and frequency response. No. 36 S.W.G. wire should be used. If larger laminations, or a bobbin which takes a thicker stack are available then the total turns may be reduced to say 500 with the tap at 100 turns. Fig. 2 shows how the transformer is used to raise the coil impedance from 25 ohms to approximately 750 ohms. As the input impedance of the transistor is about



This version of the recorder occupies a minimum of deck space.

2 to 3K, the shunting effect of the transistor loading is negligible, and the full output of the microphone is fed to the transistor

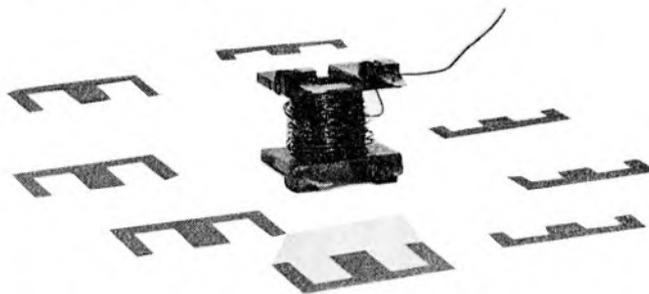
Matching High Impedance Microphones

If you possess a high-impedance moving-coil microphone, there are two ways of dealing with it: you can remove the internal transformer to convert it to a 25 ohm unit, and use the transformer described above. Or, if the microphone is to be used for other purposes, and the high impedance is to be retained, then a further impedance matching transformer may be used to step down the impedance to approximately 600 ohms. A 10 to 1 transformer is required, and, as the new transformer must not load the output of the microphone at any frequency, the inductance, and therefore the total number of turns, must be very much higher than that of the medium impedance transformer. With the stack size mentioned, a total winding of 5,000 turns tapped at 500 turns will be satisfactory. To accommodate this winding in the space available, very thin wire must be used and No. 45 S.W.G. wire is suggested.

A hand drill can be used as a geared winding machine, but very great care should be taken to maintain a constant winding tension, if frequent breakages and losses due to chipped enamel are to be avoided. Holes should be drilled in the cheeks of the bobbin to bring out the start, tap, and end of the winding, and a thin layer of paper should be introduced at the tapping point of 500 turns, and at each succeeding 1,000 turns. The paper layers reduce the self capacity of the winding and prevent some of the outer turns slipping down into the lower windings and causing losses due to semi-shortened turns. Fig. 3 shows how this transformer is used.

Crystal Microphone Matching

The crystal microphone is by far the most popular general purpose type, and is the microphone issued with most of the cheaper domestic recorders. It is unfortunate, therefore, to find that this type of microphone prefers to feed an input having an impedance of several megohms, any lower impedance causing a loss of bass response. When working into an inductive load, such as a transformer primary, the low note response is maintained down to a frequency where the capacity of the crystal resonates with the inductance of the transformer primary. Below this frequency the response falls very quickly, giving a sharp cut in low note response. This cut is useful for speech recording



A transformer in course of assembly, plus a few spare laminations.

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BUILD THIS RECORDER—(continued)

and for certain types of nature study recording; for instance if the microphone is to be used with a parabolic reflector, a bass cut below the cut-off frequency of the reflector could be a positive advantage as it would reduce handling noise, etc.

The step-down transformer described above will cut the bass response below about 300 c/s, so that for wide range recording

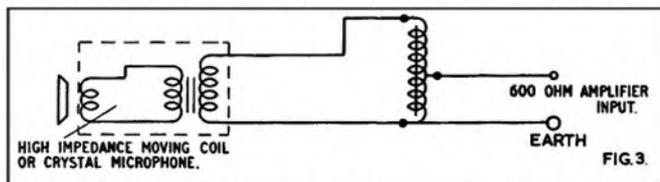


Fig. 3 Showing how the matching transformer is used.

of music or sound effects, where the full sound spectrum is to be recorded a transformer of higher inductance will be required. Such a winding is beyond the range of most home constructors, but transformers with primary inductances of 200 to 400 henries are available from Belclere, Ardente, Fortiphone and several other manufacturers. I am contacting these firms to get type numbers, prices, etc., and hope to include this information in a future article.

If the voltage output of the crystal microphone via the home-made transformer is more than adequate, the frequency response may be extended at the expense of a small loss of gain by shunting the microphone unit with a condenser of 0.001 to 0.002 mfd; this will shift the low note cut off to a lower frequency by lowering the series resonance between the transformer primary and the combined crystal and shunt condenser capacity.

An extra transistor

Another method often suggested is to use an extra transistor as an emitter follower, which has a much higher input impedance and acts as an impedance transformer rather than an amplifier. Fig. 4a shows the circuit of a standard emitter follower, and with normal HT voltage and a medium gain transistor the input impedance is raised from about 3K to 50K. Such a unit would work well from a high impedance moving coil microphone, but the impedance is still too low for use with a crystal microphone. Fortunately it is possible to raise the impedance still further by "starving" the transistor, i.e. running it at a very low collector current. This can be done by reducing the HT voltage to 1.5 volts.

Less gain needed

Finally it should be realised that a perfect emitter follower would give a gain of unity, so that the voltage output of 2 to 3 millivolts from the crystal microphone would be passed on to the recording amplifier at a much lower impedance. As we only require 0.25 millivolts, we can afford to throw away some

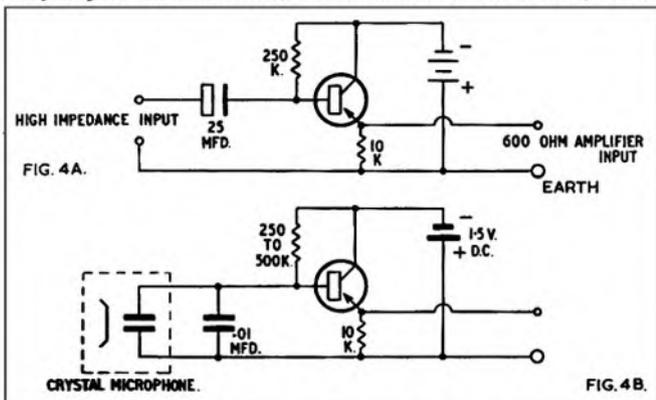


Fig. 4 Two possible circuit modifications for crystal microphones.

of this voltage in any way that gives the desired extension of frequency response. The input impedance of the transistor cannot be raised any higher, but the output impedance of the crystal unit can be lowered, together with the output voltage, by shunting the crystal with a condenser with a capacity about ten times higher than that of the crystal element. A capacity of 0.01 mfd proved to be satisfactory for most units. As the microphone and its shunt are both condensers, no input condenser is required, and the circuit becomes fig. 4b. The transistor, resistances, and tiny 1.5 volt cell can be built into a small tin box.

All matching transformer units should be screened, of course, to avoid hum pickup. A simple electrostatic screen will be adequate for use out of doors. If, however, the transformers are to be used in or around the home, then thin sheet steel (tin) or mu-metal should be used to reduce electromagnetic pickup.

One final word on microphones: use the best microphone you can afford with this portable recorder, a good 600 ohm microphone is a good investment anyway as it allows long extension leads without any possibility of hum pickup, and a simple matching transformer, or single stage transistor amplifier will match it to the static home recorder.

Transistors

Many readers have written to ask which transistors are used in my prototype recording amplifier. They are all Edison Swan XB 104 transistors, these are interchangeable with XB 102's or Mullard OC 71. XB 103's have a slightly higher gain and may be useful in the recording amplifier stages. OC 72, or any other output transistor, may give slightly more bias in the oscillator stage. The kit transistors are carefully checked for gain and oscillation after mounting in the special three-pin plugs which protect them against damage due to soldering. Surplus transistors may be used if you are willing to select suitable ones for each stage, and possibly modify the base feed and collector feed resistors for maximum gain and lowest distortion.

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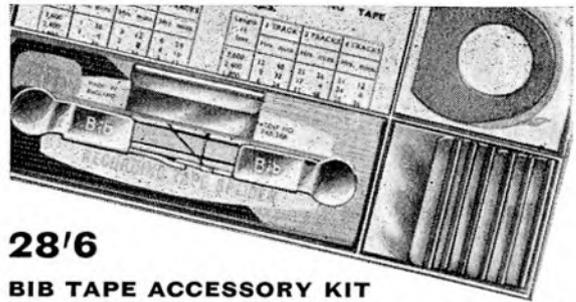
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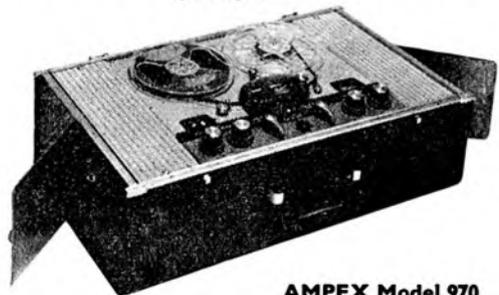
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SOUND and CINE

Choosing a Subject

by Richard Golding

WHEN Ciné begins to mean more than just a holiday diversion or a way to keep the family amused, then is the time to look for subjects worthy of attention. Having chosen a subject, it is then advisable to set a deadline for a certain competition. Competition entry is the great stimulus. It helps to keep you on your toes and to take more interest in having everything just right to the very end of the film.

The main competition categories are three—*Documentary* which can cover everything from travelogues to social statements, *Scenario* which can be no more than a dramatic or amusing incident with a twist ending, and *Genre* which embraces animated, experimental and fantasy films. The field is wide open on all three, but the greatest freedom exists in documentary production. The story is already there, the characters and the scene are established and all you have to do is give it your interpretation, whether in the fashionable Free Cinema style of Man expressing himself in one of a thousand different ways, or in a straightforward account of some industrial process.

Subjects to choose from

A popular theme of the moment is to reflect the prevailing mood of a cross-section of the population. An outstanding commercial example would be *The Savage Eye*. In this film we are taken to join the excited Los Angeles crowds at an all-in wrestling match, we absorb the atmosphere at a strip burlesque, we go to a homosexuals' ball, we look in on the fat and sometimes repulsive women in a beauty parlour and we take part in a faith healing seance. The linking device which holds these studies together is the story of a woman waiting for a divorce. The producers of this low budget film avoid the cynical approach, and our encounters with the lonely and the suffering are handled with care and compassion.

Felix Sussman, who shared first prize in the B.B.C.'s recent *Vanishing Britain* competition with a film on the British Railways, has an altogether different approach in his documentary on the crowds at Speakers' Corner in Hyde Park. His method of presentation is somewhat satirical, and the 8 mm. film *This Park is Beautiful* emphasises the crowds' behaviour in a number of sharp sequences packed with daring and revealing close-ups.

Social Problems

Philip Grosset, a Bristol schoolmaster, chooses to exploit the social documentary and has produced a number of telling and sympathetic studies of social problems. His last prize-winning film *Claremont*, with mentally retarded children for its subject, has a powerful impact that few audiences are able to reject.

There are many social failings that can be brought to notice. One has only to read a Sunday newspaper to find a dozen, but there are many other things we can do with our camera. We can disseminate information to dispell ignorance of a disease or a public disgrace as in *Birthright*, a film sponsored by the Family



The Statue of Liberty is featured in a Travelogue/Documentary film photographed and compiled by Dr. Max Strady. The film is entitled "The Big Parade".

Planning Association and intended, quite delicately, to impart knowledge which could reduce the number of unwanted children in this country. We can make a protest about something, the impersonality and ugliness of urbanisation for instance; we can make a plea for the preservation of something dear to us, a custom or folk art dying out, our land which is vanishing day by day, or our own society threatened by a general wave of violence and a lowering of moral values.

All these are valid for the professional or amateur, but in presentation at least the amateur has the advantage for he is not limited by the box office, and he knows that if he does not compromise or deviate from what he is trying to say his audiences will respect him.

Direct Reportage

Despite the purists, one does not have to be dedicated or to have a throbbing social conscience all the time. Many fine documentaries have been simple but direct reportages of an actual event such as *Midsummer Music* by Hazel Swift (the film of the Llangollen Eisteddfod which was awarded First Prize at the Royal National Eisteddfod) or the bull-fighting in the streets of Pampe-lona, and there are interesting events taking place here every day if they are, perhaps, less violent than the Feast of San Firmin. At the other end of the scale one can, if the enthusiasm is there, make a quite absorbing entertainment film of a children's party.

Enthusiasm plus care and understanding for the subject is needed to show life afresh through someone else's eyes, particularly if we are tackling a subject related to the Arts. A story of a painting or a piece of sculpture can be most rewarding and can be presented in many ways. A form of this which is gaining in popularity on the Continent is to show what inspired the artist in the first place, and then to go with him through the various stages to the finished work. A more amusing variation is to show the various stages of an action painting, especially if one can include some diversion such as the seemingly ridiculous bicycling across a spreadeagled canvas.

(Continued on page 87)

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An O.K. direct reportage theme of the moment is, of course, Nuclear War is Hell and there are many demonstrations and marches going on all over the country to give impact to any film campaigning against nuclear madness in a dramatic presentation or campaigning against the campaigners somewhat more satirically.

The Travelogue

For every idea that I have thrown up here you can find a hundred, but our basic documentary, after all, is the travelogue and we turn them out by the thousand. Not all, however, have a freshness and a story-line as strong as *The Big Parade* by Dr. Max Strady.

Dr. Strady had intended a filming holiday in the U.S.A. for some years, and last year the opportunity came to get away for six weeks. His problem was—how to present a country so vast, so diverse, so complex in one short film? The subject, evidently, had to be cut down to size, so he decided that after a brief historical introduction, where he could weave across the Continent from San Francisco to New York, he would limit himself to Manhattan which has all the audacity and the exceptional of the American character itself. There he could concentrate on the American way of life and there he could show the great skyscrapers, proud among the hustle; and the big parade with its whirling super-efficient drum-majorettes would make a splendid finale to the film.

Reading up beforehand

Before starting the trip, Dr. Strady read as many books about the country as possible to see what it was that had impressed the writers most. This allowed him to work out a general framework for his photography, sufficient enough to permit him to choose the most vital sequences, yet convenient for his limited amount of time.

In these books he found a strong desire for a past tradition, so he began by filming the Christopher Columbus ship in the harbour of San Francisco. He was lucky, incidentally, for a festival was being held while he was there and he was able to shoot the ship in full sail with students dressed as the original crew. From there he moved on to Disneyland to film some costumed Indians war-dancing in natural surroundings. At Williamsburg he persuaded a local drama group to dress and act out a short scene in early nineteenth century clothes borrowed from a village museum. A sympathetic official at the Ford museum allowed him to film vintage cars and engines of the time of Greenfield Village. With his continuity intact and his historical introduction complete, he was able to sweep into New York for the *tour de force* of the big parade. Several times he shot the same scene twice, to be sure that his editing would have a suppleness and that he would have a choice of L to R or R to L pans to cut in.

Basic equipment

His basic equipment was a Bolex Reflex 16mm camera with three lenses, but as he was to be continually on the move, he took no tripod. Various methods were employed to steady the camera, arms pressed against a wall, his back to a tree, and when there was nothing else he sat down on the ground with his elbows on his knees. Despite the lack of tripod there is a great stability of image in this film of which he says: "It needed a terrific passion for the subject to carry with me always some twelve pounds of camera and films, but everywhere I went, during each waking hour I wanted the incident, the unexpected, the sensational that doesn't ever give you the second chance to film again!"

The Big Parade lasts 20 minutes, and the track I heard was a skilfully composed mixture of traditional jazz on magnetic stripe. Dr. Strady normally works with mag/stripes, and a tip he gave me was this. When he gets a film newly striped from the Labs, he uses some old heads for the first two runs on the projector for he maintains that it is the fresh stripe that causes most damage to the magnetic heads. I checked on this with the Bell and Howell Organisation. They said that this



Hazel Swift, who directed a prize-winning film on the Llangollen Eisteddfod "Midsummer Music", is seen here talking to Terry Fellows, who played a leading part in the film. One of Miss Swift's problems in filming at the Llangollen Eisteddfod was that of getting moving shots. Luckily, she was able to hire a boat and live on it for the complete holiday. Her tracking shots were obtained by getting a horse to pull the boat along—probably the only water-borne horse-drawn tracking shots in existence! (Photo by courtesy of Western Mail and Echo, Cardiff).

was more or less correct but the damage, in any case, was slight and should not worry the normal user too much. For those who use stripe in larger quantities however the Perma process (Zonal Film Facilities of Hammersmith) is recommended. This renders the film and stripe more supple and scratch resistance is increased at little extra cost. Available for 16mm and 8mm film.

For those of you who would like to try their hand at direct reportage during the next few weeks, here is a list of some British events in March:

The traditional Whippity Stoorie—Lanarks. The Midgely Place Play—Yorks. The Scottish Spring Flower Show. Head of the Trent Race—Notts. Head of the Dee Race—Chester. The Thoroughbred Stallion Show—Newmarket. The Grand National. Several International Football and Hockey matches. Easter Parades.

Film Producing Holiday

Special Interest Holidays of 140 Eastcote Road, Pinner, Middlesex, in association with a Perthshire inn, are arranging a film producing holiday. Over the two weeks June 3rd to 17th, students will produce a 30 minute film "from scratch". Supervised by a professional film director, the course covers devising a story, scripting, exterior and interior filming, and editing. The finished 16mm film (in which students appear) will then be screened and criticised. The course is for amateurs, and no experience is expected from those who enrol. Everything is provided—the cost of £21 per week includes accommodation, all necessary film and equipment, transport to the locations. The scenery is among the grandest in Scotland, with superb views of mountain and loch. It may be possible to run a second course from June 17th to July 1st for those unable to secure a place on the first course.

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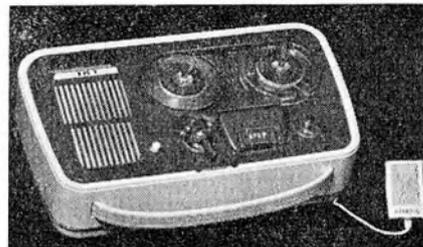
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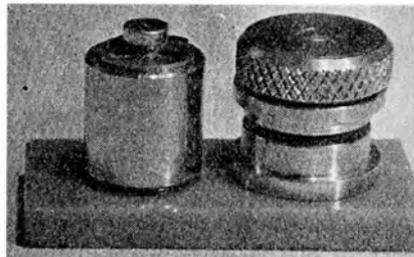
★
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A NEW portable battery operated tape recorder—the TK 1—is just announced by Grundig (Great Britain) Limited. Fully transistorised, the TK 1 is a dual-track machine giving a total of 30 minutes playing time. Operating at a constant speed of 3 $\frac{3}{4}$ i/s, the TK 1 is powered by six high capacity type batteries, giving at least 20 hours operating time. The bias frequency is 40 Kc/s ensuring distortion-free recording, and the Magic Eye, DM 1, Recording Level Indicator receives its anode potential from the bias Oscillator section of the machine. In addition to the DM 1 Magic Eye, 7 transistors are used on a printed circuit. The frequency response is 80-8,000 c/s, and the power output is 250 mW.

The TK 1 is completely controlled by two switches—the four position selector switch on the left of the machine for Stop/Start Playback and Rewind, and the Recording Level, Volume Control, and Monitor Volume and Tone Control on the right. A record safety button is fitted to prevent accidental erasure and there is a lockable temporary stop control to allow immediate stop or start. A storage pocket for the microphone and facilities for the connection of an external motor supply are also provided.

Weighing only 8 lbs. and measuring 11 $\frac{1}{2}$ in. × 7 in. × 4 $\frac{1}{2}$ in., the TK 1 is finished in cream grained plastic with gilt fittings and a slate grey deck. It is supplied with a full set of high capacity type batteries, microphone, 1 spool of tape, 1 empty spool and two connecting cables. The price complete is 29 guineas.



★
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THE Synchrofo makes it possible to synchronise any tape recorder to electrical or electro-mechanical devices, such as slide projectors or model electric railways. The unit is supplied ready assembled and complete with connecting wire, a three-point junction and 40 self-adhesive synchrofoils. Fitting the Synchrofo to a tape deck is a simple matter, but it is recommended that several positions be tried, so that the best tape path is arrived at. The synchrofoils—further supplies of which are available at 7s. 6d. per 100—are attached to the tape at points where it is required to change the colour slides, etc. The gap on the Synchrofo head must be carefully lined up with the track in use on the tape, and provision is made for this, since this section of the head is reversible. The retail price of the Synchrofo, complete with 40 synchrofoils, junction point and wire is 47s. 6d.

The manufacturers are Technical Suppliers Limited, Hudson House, 63 Goldhawk Road, London, W.12.

AKG STEREO MICROPHONE FIELD TRIAL

IT was originally curiosity, rather than a desire to be useful, that persuaded me to investigate the AKG D88 stereo mike. I have often admired the sleek and super-expensive professional products of this Austrian firm (example: the C12 with its selector switch to give a choice of nine different polar diagrams, price £185); so when I saw the stereo D88 priced at only £17 10s. I had to examine it. In appearance it resembles an overgrown brass thimble. It is very neat, and this shape is pleasing against the grey plastic parts of the case. No one minds what a studio microphone looks like, but not everyone wants an object in the living room which looks like one, so I consider this point of great importance.

Two Moving-coil Capsules

Looking through the perforations of the metal case, one can see the two stereo microphone units, mounted within. A usefully long lead is provided, and this is also of an unobtrusive light grey colour. As I examined the D88 thoroughly, curiosity got the better of me. It looked such a fine job, and it came from such a reputable stable, that interesting results seemed inevitable. Two stereo recorders were available (Tandberg and EMI TR 52) so the necessary transformers were procured and the fun began. At a later date this microphone will be subjected to full tests and reported technically in *The Tape Recorder*, and in view of this it should be emphasised that this review is in the nature of a "home test" or "field trial" only. Nevertheless, the results obtained were so good that I have no doubt whatsoever that the tests will show up this product in a very favourable light.

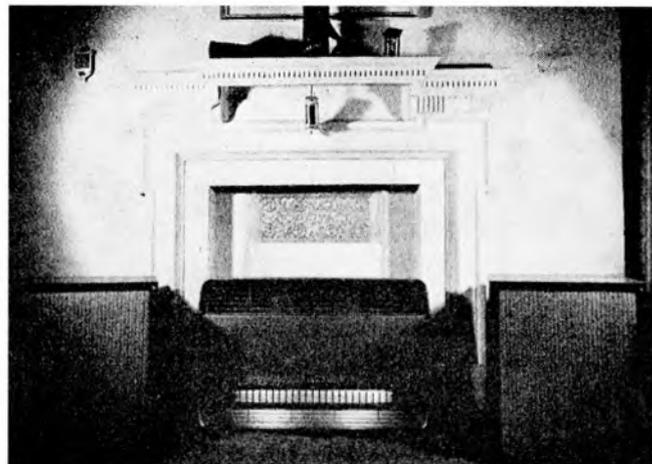
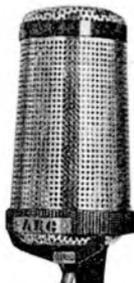
First, plumping for the dynamic "movement" effects which formed the basis for nearly all the early stereo discs, I tried it on cars. They obligingly buzzed across the room on replay! Next, pacing the deck and reading a book, I amused myself by following myself from speaker to speaker. Further amusement was created at a later stage, and with audience, by luring two people into a heated argument. The result was far better than a pin-pong game that one can remember from an early stereo tape.

In order to show off the potentialities of home-recorded stereo, I next hung the D88 upside down from a hook underneath the

Technical Specification

Dual moving coil stereo microphone.
Frequency Response: 80-15,000 c/s.
Source Impedance: 200 ohms each channel, or 50,000 ohms with transformer.
Sensitivity: 75 dB low impedance, -52 dB high impedance. Double Cardioid for stereo, broad cardioid for mono, price £17 10s. low impedance, £19 10s. high impedance.

Manufactured by Akustische und Kino-Gerate Ges. m.b.H. Sole U.K. agents, Politechna (London) Ltd., 3 Percy Street, London, W.1.



Note: The object top left is only a monaural cuckoo clock.

mantelpiece, and later hung it the right way up, holding it against its cable by means of a rubber band (see photo). Very few people noticed it; and I explained it away to those who did by saying that it was a thermostatic control for the electric fire beneath it. In this way I was able to record the well-known chatter and clatter of a fairly lively party of eight; and this is where stereo proved itself instantly against the usual mono recordings of such gatherings. By switching off one channel for a minute, and then switching it in again, clarity became chaos and there (as the second channel was faded in again) chaos became intelligent, easily followed conversation.

Such tricks are, I admit, not the job of stereo, and nor are they an excuse for dipping the hand into the pocket for £17 10s.; but they very firmly register the value of stereo in the minds of people who have not stopped to consider it seriously before, in terms of home recording. And at this point it seems a good idea to dwell on the whole subject of stereo recorders for a while. Quite a number of people are buying them, even though the percentage of stereo recorders that are sold is small compared with the really large numbers of mono machines. Judging by reports received, many of their owners are using them for recording the BBC experimental stereo broadcasts; still others use them mainly for mono recording, but for the replay of stereo tapes. So far, it seems, it is only the serious experimenters who are really attempting to use their stereo equipment fully; and, of course, these users will already be ahead of all the foregoing points that I have made.

Some Uses for Tape Stereo

For the potential tape user, with thoughts in mind for really worthwhile results and maximum enjoyment, a stereo recorder deserves careful consideration. The cine enthusiast who intends to run his projector with a tape recorder to provide the sound should think of stereo very seriously. The business man who has ideas for recording meetings and discussions should make a point of trying it out under practical working conditions, for he will find that typed transcriptions (let alone replays) are far more understandable. Amateur dramatic groups will find it of tremendous help: in fact it makes all the difference between the commonplace and the vividly realistic. These are but a few of the more obvious jobs for stereo. There are dozens more, and the field opens wide when one begins to think in terms of music as played in the home.

There are several ways in which one can use the D88. In the first place, pending the acquisition of a stereo recorder, it makes a very good monaural microphone when using only one of its two channels. Alternatively, the two channels can be connected in parallel for mono use, providing a really broad polar diagram. The impedance of the microphone is 200 ohms per channel, which means that it is 100 ohms with the parallel connection mentioned above. The polar diagrams of the independent channels are cardioid, and the above mono connection thus yields a very broad cardioid pattern. However, this will doubtless be discussed more fully in the final review at a later date.

E.D.

"Listen and Learn"

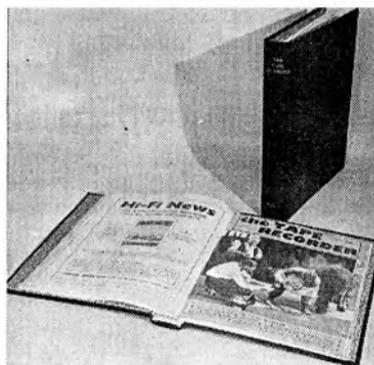
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TAPE REVIEWS

Three Bi-Tapes Releases

JE129 *Jangle Box Joyride*, Eddie Purkiss, piano. 3-in. reel (speed 3½ i/s), price 12s. 6d.

Ever since Winifred Atwell knocked us into a party feeling with her "other piano"—the pub variety of that noble instrument has become popular everywhere. There are even special "jangle box" pianos made, with a third pedal to add all those lovely overtones—a piece of wire or tissue paper against the strings makes a passable substitute. I am not clear which sort of jangle box was played by Mr. Eddie Purkiss on this tape, although I found that judicious juggling with my tone controls could make it sound like anything from a concert grand to a harpsicord. The actual style of playing is very pleasant, and of a sort that can be heard in many pubs and clubs. The six titles are *Joyride*, *Charleston*, *Fountain Boogie*, *Eddie's Tune*, *Criss Cross Boogie*, and *The Harry Lime Theme*.

LJA128 *Trad Mad*, Johnny Gooding and his Jazzmen. 5-in. reel, speed 3½ i/s, price 52s. 6d.

I don't know Johnny Gooding and his Jazzmen, but there's no doubt they know their jazz. If this leads them to quote from the great players—such as the repeated notes effect of Louis Armstrong in *All of Me*, well, no jazz enthusiast is going to grumble at that. Both in repertoire and instrumentation (the "dots" and the "bods") the Jazzmen have declared their allegiance to Traditional Jazz. There is the usual front line of trumpet, clarinet and trombone, and a smashing banjo. The 16 titles include such favourites as *I Want A Girl*, *Shine*, *Doctor Jazz*, *Royal Garden Blues*, *Whistling Rufus*, and *Some of These Days*. For dancing or listening to, this tape can definitely be recommended.

LMA118 "*Two Moods*," the Berkeley Concert Orchestra conducted by Roy Campbell. 5-in. reel, speed 3½ c/s, price 52s. 6d.

There are no less than 23 items on this tape, all of the non-obtrusive, anonymous type we expect to hear in the background in restaurants, fashion parades, newsreels, and (dare we say it) TV Commercials. The tape itself carries the title "Two Moods," and though I felt that more than two kinds of atmosphere were conjured up by these pleasant pieces, I got the family on to trying to pair up the titles as opposites, and here are some examples which give you an idea of this tape's range of moods:—*Happy Hippo* and *Brazilian Butterfly*; *Bikini Beach* and *Holiday on Ice*; *Lonely Oboe* and *Mr. Happy*; *Blues against Time* and *Merry as a Grig*. Clearly this tape is designed, and well put together, more for background than foreground listening, but there are no doubt many situations in which to accompany food or just a mood this tape is very good.

The Recordings: I cannot rate the recordings an unmitigated 100 per cent, and this is only in part due to my prejudice against recording music at 3½ i/s—which, except possibly on ultra-narrow-gap tape heads, undoubtedly limits the frequency response. The musical balance had occasional lapses on the second tape, and there was some flutter on the third. **J.N.B.**

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EQUIPMENT REVIEWED

★
**TAPE
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 LTD.
 SOUND
 "STUDIO"
 RECORDER**



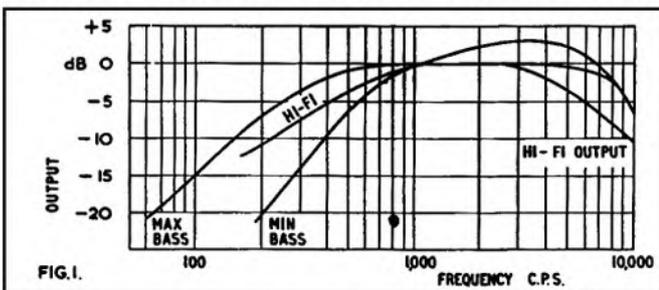
Manufacturer's Specification

Deck: Collaro Studio. Frequency Response: 60-12,000 c/s \pm 3 dB at $7\frac{1}{2}$ i/s. Hum and Noise: -50 dB. Wow and Flutter: 0.15% at $3\frac{3}{4}$ i/s. Mixing, superimposing, straight through amplifier facilities. Size: $15\frac{1}{2} \times 14\frac{1}{4} \times 7\frac{1}{2}$ ins. Weight: 32 lbs. Price: £44 2s. Manufactured by Tape Recorders (Electronics) Ltd., 784-788 High Road, Tottenham, London, N.17.

★ ★ ★

THE Sound "Studio" tape recorder is a relatively inexpensive tape machine of low weight (25 lb.) and thus is truly portable, though it incorporates several features not usually found in machines designed with both eyes firmly on keeping down weight and cost. It is small, $15\frac{1}{2} \times 14\frac{1}{4} \times 7\frac{1}{2}$ inches high, though not in the miniature class. It is obviously not designed for the true hi-fi enthusiast, but for the mass of young people getting their first taste of sound recording. From these the hi-fi enthusiast of tomorrow appears.

The deck layout is conventional, with the two spools (7 in. dia. max.) at the rear and a three-digit footage indicator between them. This is not too easily read, the figures being rather small and in the particular model tested, not too accurately aligned in the aperture. Five black piano type keys and two switches control the tape motion. The right hand switch



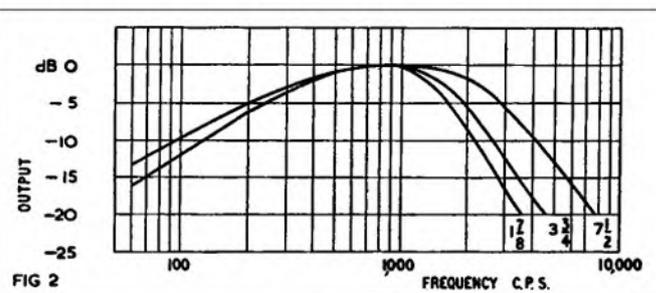
● Response curves—replay only

selects tape speed, three speeds ($7\frac{1}{2}$, $3\frac{3}{4}$, and $1\frac{1}{2}$ i/s) being available, while the left hand switch selects "record" or "replay". Accidental movement into the record position is prevented by mechanically interlocking it with the start key. Two keys give control of the high speed "wind-on" and "re-wind", the fourth, an extra wide key, is the stop action, while the fifth removes the tape drive to give "pause" facilities.

Four knobs along the front provide control of microphone and radio inputs, super-imposition, tone control and replay volume. An EM 84 bar-type volume indicator is centrally placed. The mains cable and microphone are stored in an unusually spacious cubby in the back of the machine, and a small rear

panel carries four jack sockets for the two input signals, a hi-fi output and a 3 ohm external speaker.

The facilities have obviously been given a great deal of thought, for almost everything that the budding sound engineer could ask for has been provided. A musical background can be mixed in at the time the recording is made or it may be added afterwards. The input signal can be checked for level before recording commences and it can be monitored by the internal speaker while recording is in progress, though the signal on the tape cannot be monitored during recording for this requires a second head and its own amplifier. This is too much to ask for 42 gns. A signal intended to drive a hi-fi amplifier is available at one of the rear jack sockets, and as this is taken off before the tone control, volume control and output stage it should be of higher quality than any signal taken from the output transformer. A signal of approximately



● Record/Replay response curves

500 millivolts is available, but the source impedance is rather high and only a short cable is permissible between tape recorder and hi-fi amplifier.

The usual objective measurements were made with the following results.

Frequency Response: Fig. 1 indicates the replay response using a standard test tape, the two curves indicating the limits of the tone control. As this has no calibration and no indicator mark, the "flat" response position is not obvious. The main effect of the tone control is to attenuate frequencies between about 60 and 800 c/s and insert a small peak in the 2 to 6 kc/s region. The combined record and replay response is shown in fig. 2. At all three tape speeds the response was disappointing and well below the claimed figures. As the tone control was unmarked these figures were measured at the hi-fi output socket, and thus should be compared with the hi-fi curve in fig. 1.

Signal/Noise Ratio: Table 1 indicates the signal/noise ratios at all three tape speeds. In respect of signal/noise the machine is above average, a result that is in part due to the effectiveness of the erase arrangements. The residual noise remaining after erasing a fully modulated tape is only a few dB above the noise from virgin tape. The difference, about 10 dB, (at $3\frac{3}{4}$ i/s) between weighted and unweighted values of signal/noise, is an indication that mains frequency noise forms a large proportion of the residual noise, a result that is confirmed by a few moments listening.

Wow and Flutter: The speed instabilities we know as wow and flutter are shown in Table 2 and are seen to be a little on the high side. In addition, the variation in wow and flutter during the running of a reel was higher than usual, the values changing over a range of about two to one during a cycle lasting about eight seconds.

Mechanical Noise: The acoustic noise radiated by the machine was measured in the manner described elsewhere in this issue

(continued on page 93)

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SOUND STUDIO REVIEW—(continued)

of *The Tape Recorder* and a sound level of 36 phons recorded. About half the total acoustic noise was produced by the "works" with the tape stationary. The machine would be classed as noisy if used in a quiet house in the evening, but the noise would be un-noticed when used in a house near a busy street.

Recording Tests: Recordings of speech and music obviously lacked "top" though it is fair comment that the performance

Table 1—Signal/Noise Ratio

Tape Speed	7½ i/s	3½ i/s	1½ i/s
Unweighted	45dB	45dB	50dB
Weighted	48dB	55dB	56dB

Table 2—Wow and Flutter

Tape Speed	7½ i/s	3½ i/s	1½ i/s
Total	0.22%	0.35%	0.8%

Table 3—Input Sensitivity

Microphone Input	2.5 mV for full modulation
Radio Input	0.42 volt for full modulation

at a tape speed of 7½ i/s is superior to that of the average medium wave radio receiver. The 8x5 in. speaker is unusually large and effective, but the lack of bass in the electrical signal limits its opportunities. This lack of both bass and top is obvious when an external speaker of high quality is used. In fact the performance of the internal speaker was preferred to that of a large 18 in. unit in a 10 cubic foot cabinet.

General Impressions

The Studio machine gave no sign of any real trouble during a long period of use. The high speed of rewind (860 ft. in 50 seconds) presents a difficult job to the braking system and while the brakes were satisfactory in normal use, their performance in stopping the tape from a high speed rewind could be improved. The tape pressure pads could, with advantage, be arranged to retract a little further, for it is sometimes difficult to insert the tape without getting it on top of the pads. There is then a great temptation to lift it off with the nearest convenient object a screwdriver that will almost certainly be magnetised.

Summary

Some attention to the circuitry is required to bring the frequency response up to current standards, and the mechanics might well be improved in respect of wow and flutter. With some attention given to these two points the Studio recorder would be very good value for money for the facilities are excellent. **James Moir**

Manufacturer's Comment

This review was submitted to the manufacturers before publication, and they have supplied the following comments:

The signal to noise ratio figures are satisfactory and it is therefore surprising to see the phrase "mains frequency noise forms a large proportion of the residual noise," as a non-technical reader would probably deduce from this that the mains frequency noise was objectionable. The wow and flutter figures in table two are higher than we normally encounter. Collaro claim 0.14% at 3½ IPS and, generally speaking, we have found them to be correct.

The braking system on the Collaro deck is criticised but Collaro's view when considering this point on design (with which we would agree) is that "vicious" braking is undesirable as tape stretch could occur and possibly even tape breakage.

TAPE RECORDERS . AUDIO EQUIPMENT . DISC CUTTING STD & LP FROM TAPE . STUDIO FACILITIES . HIRE SERVICE . SALES . EXCHANGES

MAGNEGRAPH

1 Hanway Place, London, W.1

Tel: LAN 2156

THE SIMON "CYMBAL" PORTABLE TAPE RECORDER

Manufacturer's Specification

Deck: Garrard magazine-loading type. **Tape Speed:** 3½ i/s. **Frequency Response:** 70-9,000 c/s. **Total Playing Time:** 70 mins. **Power Output:** 3 watts into 5 x 3 in. loudspeaker: socket for ext. L/S. **Level Indicator:** magic eye. **Inputs:** for microphone and radiogram. **Size:** 13 x 9½ x 6½ in. **Weight:** 22 lb. **Price:** £25 4s. including crystal microphone and reel of tape.

Manufactured by Simon Equipment Ltd., 48 George Street, London, W.1.

THIS latest tape recorder from Simon Equipment Ltd., caused quite a stir when it was received, and not surprisingly comparisons were made with the Simon Ministrelle (See Review by A. Tutchings in our June 1960 issue).

Perhaps the first matter for comment is the very small dimensions of the Cymbal. Remembering that the Garrard magazine loading deck measures 12 x 8 in. it will be realised that size has been cut to an absolute minimum when the Cymbal's overall dimensions—13 x 9½ x 6½ in.—are examined. Certainly, the top dimensions could scarcely be reduced further. The controls and sockets are mounted on the front panel, grouped around the carrying handle. On the left is the volume control, with the microphone and radio input sockets above. In the centre is the on/off switch and combined tone control, with the Magic Eye lever indicator above. The socket for connection to an external loudspeaker is mounted on the right.

The magazine deck

It is not proposed to say very much in the present review about the deck itself. This has been covered fully by A. Tutchings in the Simon review, and his review of the deck which was published in August 1960. However, the relative ease of operating tape by beginners was tested, and in each case the magazine appeared to justify itself. When the 3½ in. reels are removed from the magazine (simply a matter of removing two metal clips) newcomers to tape recording found it considerably more difficult to lace up the tape in the ordinary manner. Perhaps a word is in order at this point on the question of spool sizes. The machine will in fact operate comfortably with 4 in. spools, but these are a tight fit in the magazine.

The usual wide range of types of recording were attempted and very reasonable results were obtained, if the tape for reasons of comparison was removed and played back on a semi-professional machine. The playback quality from the Cymbal's own loudspeaker is naturally limited by size and the type of mounting which one must resort to in any portable machine of this kind.

The loudspeaker

Nevertheless, the designer has clearly given a great deal of thought to this well-known restriction, and loudspeaker grille openings are provided on both sides of the machine with the following reference in the instruction leaflet: "To obtain the best results from the Cymbal using its own loudspeaker arrangements,

(continued on page 95)

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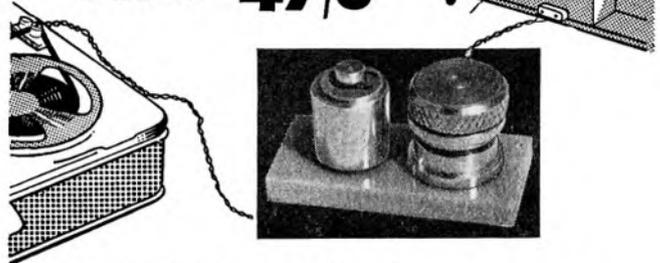
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it is advantageous to stand the Cymbal across a corner so that the sound is reflected off the walls. It is for such arrangements that the cabinet is sound vented on both sides, such a position will considerably improve the reproduction of the bass frequencies."

This position was tried, and it was indeed discovered that the baffle action of the walls gave the sound of depth which was a noticeable improvement on the normal sound from a small cabinet. The microphone provided with this machine is the Acos Mic. 40, whose sensitivity was found to be perfectly adequate, although volume settings of as much as three-quarter maximum were found to be necessary for some recordings where the distance from the microphone was in excess of about 6 feet. Recordings from radio were highly satisfactory.

At the price, and in view of its small dimensions, this recorder well deserves to be placed alongside Simon Equipment's other well-established machines, namely, the SP4 Automatic and the Ministrelle. J.N.B.

* * *

★
THE
GRAMPIAN
DP4 SERIES
MOVING COIL
MICROPHONE
★



Manufacturer's Specification

Moving coil stick microphone. **Weight:** 8 oz. **Frequency Response:** 50 c/s to 15,000 c/s. **Output Levels:** DP4L, 25 ohms, 86 dB below 1 volt/dyne/cm²; DP4M 600 ohms, 70 dB below 1 volt/ryne/cm²; DP4H 50,000 ohms, 52 dB below 1 volt/dyne/cm². **Price:** DP4L £7 11s.; DP4M and DP4H £8 11s.

Manufactured by Grampian Reproducers Ltd., Hanworth Trading Estate, Feltham, Middlesex.

★ * ★
THIS Microphone is very robust, and is slender and unobtrusive in appearance. Its shape fits the hand, and for interview work a simple twist of the wrist moves the sensitive head from the interviewer to the subject with very low handling noise. The polar response is generally omnidirectional, but, as with all pressure microphones, there is a slight beam effect at high frequencies. Due to the small diaphragm and case diameter, this focusing is evident only above 5 Kc/s, and all fundamental tones in voice or music are reproduced with non-critical placement of the microphone. Wind noise is low, and this unit is very suitable for outdoor use with a portable recorder.

Frequency Response

The responses of fig. 1 show that, on axis, the response extends from 50 c/s to at least 10,000 c/s, the limit of my white noise test equipment, and that, off axis, at 90 deg., the response is unaffected to 5 Kc/s. The slight peak at 3 Kc/s is due to the fundamental diaphragm resonance, and gives "presence" to voice reproduction without over-emphasising the sibilants.

Impedance

The model sent in for review was a DP4M, with a nominal impedance of 600 ohms. The impedance was measured over the frequency range and found to be 770 ohms at 1 Kc/s, falling to

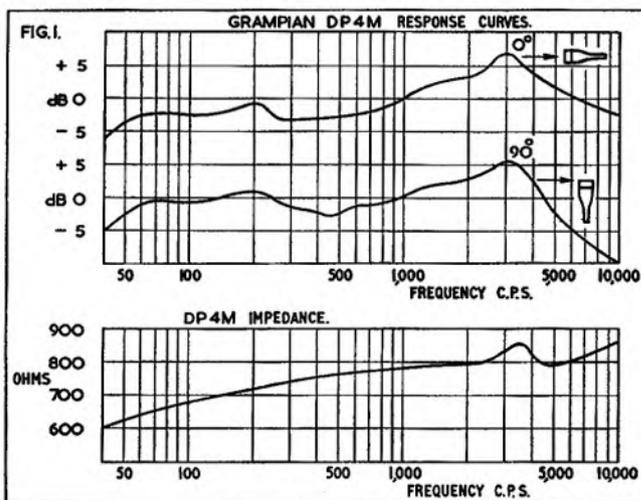
600 ohms at 40 c/s and rising to 850 ohms at resonance and at very high frequencies, see Fig 2.

Output

The output at 1 Kc/s was 0.28 millivolts per bar which corresponds to 71 dB below 1 volt/dyne/cm². This means that the DP4H, or the DP4L via a 50:1 transformer will deliver about 2.5 millivolts per bar to the grid of a valve or to the high impedance input jack of a tape recorder.

Comment

Tested subjectively, this microphone handles well and gives pleasing voice quality over a wide angle. In the open air there is little change of quality with distance, and the balance between voice and ambient background noise sounds natural without the



background obscuring the voice as sometimes happens with larger units with an uneven polar response at middle and high frequencies. Indoors, also, even in conditions of reverberation or live acoustics, the separation of voice and background remains clean. Sound effects have plenty of "body" due to the excellent bass response, but due to the complete absence of any pressure gradient effect the voice has no trace of heaviness. For music recording the microphone is useful for picking out a solo instrument, using the close microphone technique, in combination with a more distant microphone such as a ribbon. This microphone has an indefinable "something" which cannot be expressed entirely in terms of frequency response or polar diagram. The nearest I can get to it is "natural balance."

I would rate this microphone as being one of the six best I have tested, and can thoroughly recommend it for general use.

A. Tutchings.

* * *

THE STUZZI TUNER UNIT

Manufacturer's Specification

Tuning Range: Medium Wave 190-600 metres (approx.); Long Wave, pre-tuned to 1,500 metres. **Circuit:** Single transistor RF amplifier, with germanium diode detector and fixed regeneration. **Transistors:** XA102 and GEX34 or equivalent. **Battery Complement:** 4 penlight U12 or equivalent. **Battery Life:** 500-1,000 hours. **Current Consumption:** 1.5-2 mA. **Aerial:** ferrite rod; external socket fitted. **Size:** 5½ × 4¼ × 1½ in. **Weight:** 17 oz. **Price:** £5 5s., with jack plug, phono plug, or co-axial plug as required.

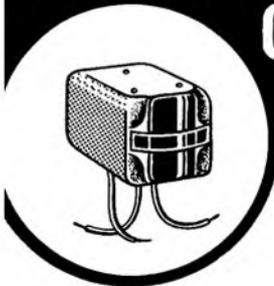
Manufactured by Recording Devices, Ltd., 44, Southern Row, Kensington, London, W.10.

* * *

SURELY every owner of a tape recorder uses his machine at some time or another to record from radio—and takes care to avoid infringement of the copyright laws, by replaying the tapes only in the domestic environment.

(Continued overleaf)

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STUZZI TUNER REVIEW—(continued)

★
A NEW
TUNER UNIT
FOR TAPE
RECORDING
BY STUZZI



★
Yet, if your "domestic environment" is anything like mine, the chances are that the family tape enthusiast cannot always have access to the family radio set, and it is to get round this problem that the various tape tuner units and tape jacks have been manufactured. They consist of transistor receivers producing an audio output at a fraction of a volt or, in the simplest examples, of a crystal detector set pre-tuned to a single station.

The Controls

The Stuzzi Tape Tuner is the most elaborate unit I have come across so far, and has three variable controls in addition to a Long Wave/Medium Wave change-over switch. Firstly, there is the *Sensitivity Control*, which incorporates the *On/Off switch* and decreases the volume in steps as opposed to the usual sliding control. Then there is a *Tuning Control* to allow coarse tuning of programmes, and finally a *Bandspread Control*, used to give fine tuning.

Preliminary tests were carried out with the unit plugged into the "Radio" and "Microphone" sockets of a number of different recorders—using the P.A. or "Straight Through" Amplifier facility. This soon revealed that the tuner will satisfactorily match any high impedance input, and gave practice in the tuning procedure. This, for Medium Wave stations, involved tuning roughly round the band, setting the sensitivity to the level which just avoided instability (whistles), then adjusting the fine tuning and the recorder's volume control for normal listening. The built-in ferrite rod aerial was used throughout, and pulled in all local programmes and a useful number of foreign transmissions. After nightfall, there were more continental and B.B.C. Regional signals, of course. The ferrite aerial is directional, and one usually turns the tuner for maximum signal. In cases of overloading, however, on too strong a local station, it was found possible to use tuner angle as a handy secondary volume control.

Good Recordings

Recordings confirmed that the tuner's performance, with the built-in aerial, is very good indeed. It must be admitted that the reviewer's hilltop situation normally enjoys good reception, but it seems likely that few situations would require an external aerial. The main usefulness of such an aerial was found to be the singling out of distant stations. On Long Waves, the tuner is pre-tuned to the Light Programme on 1,500 metres, and the Tuning Control is used for fine tuning. To sum up then, this new unit adds efficient radio reception to a tape recorder's potential, and a special commendation must be made to its smart appearance.

J.N.B.

Please mention "The Tape Recorder" when writing to Advertisers

our readers write

. . . about the Add-on-Deck

From:—A. Tutchings, 14 Rook Hill Road, Friars Cliff, Christchurch, Hants.

*Dear Sir:—*The article by Mr. John D. Hone, in the February issue "An Add-On tape deck for dubbing" mentions my head and tape transport kit featured in my Portable Recorder articles together with a Transistor Pre-amplifier kit described earlier. The result of this has been a veritable deluge of enquiries—all with stamped addressed envelopes as suggested by Mr. Hone, thank you very much—which seems to show that Mr. Hone has hit the jackpot and described something which everybody has been waiting for.

May I be allowed a little space to describe a slight alteration to his layout which will eliminate a couple of tape guide pillars, and use my units without any modification? The photograph which heads my article on the Portable Recorder, in the same issue, shows that, when both reels are rotating in a clockwise direction, the head plays the bottom track. A little consideration will show that this is the standard track position used on all recorders nowadays. If Mr. Hone's layout is used, with the head facing left, it will be necessary to raise the head, relative to the tape guides, so that the top track is scanned to maintain standard track position. By facing the head to the right and turning over the reel, so that the oxide faces left, the tape is pulled against the guides and the two extra posts fitted by Mr. Hone will no longer be required. In addition, the head scans the bottom track as before, and no modification to the head mounting is required. The tape will now leave the capstan with the oxide facing the front, and will have to be turned through 180 degrees to wind oxide-in on the take up reel. I suggest that a horizontal guide, with a diameter of about half an inch, should be used in place of the present vertical post. The tape would then be given a 90 degree turn after leaving the capstan and pass under the horizontal guide; the tape will then be raised half an inch by passing round the guide and be turned through a further 90 degrees on its way to the take up reel so that it enters the reel at approximately the correct level and with the oxide in.

One further small point, the head is normally mounted solidly on the guide plate with the gap set exactly 90 degrees to the tape path; if tapes are to be played, which are not recorded on professional equipment, an azimuth adjustment may be required to ensure maximum top response. Thin paper washers placed under the head spacing washers will compress enough to allow a small azimuth adjustment by tightening one head securing screw and loosening the other. If all the tapes to be copied are

recorded on the main machine, then only one initial azimuth adjustment will be required, but if tapes from other sources are to be played the azimuth should be checked if high note response is poor.

Yours sincerely

. . . about tape in New Zealand

From:—Les Thomas, 5 Thomas Street, Alexandra, Central Otago, New Zealand.

*Dear Sir:—*I look forward to receiving my copy of *The Tape Recorder* every month. It is always full of so many interesting articles. Keep on with the good work. I am very interested in tape recording especially tapespondence.

I have tape pals in most parts of the world. I am Friendship Officer of The Tape Recording Club, which means I welcome all new members in the North Island. I am also a member of World Tape Pals. I enclose photographs of a recording studio I have just finished building. My wife made the curtains with the World Tape Pals insignia in the centre with black tape leading out to microphones with the names of the different countries on them. My recording equipment consists of three Recorders, one 3-speed Philips, one 3-speed with Collaro deck, and a Clarion portable, also a 6 channel mixing panel and a Kaco inverter for running my recorder from my Austin van. The microphones I use are Japanese, which I find very good. My main interests in recording are Musical Shows, Concerts, interviewing overseas visitors to our town and tapespondence.

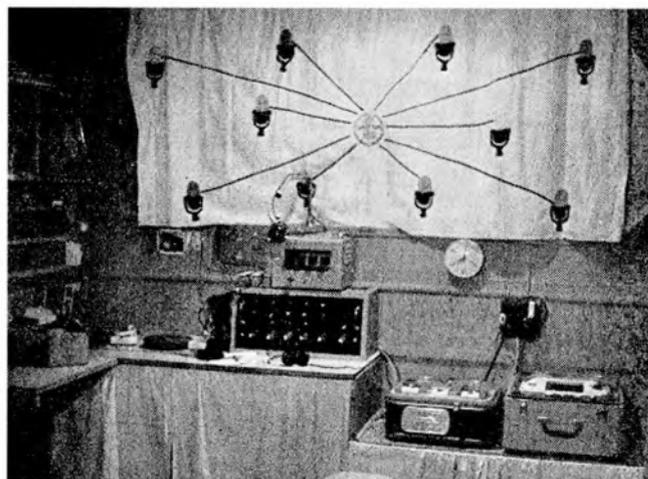
In the left hand photo, you see two Philips record players and the 6-channel mixer with playback amplifier on top of it. Next to that are two of my recorders. I would like to add the prices of recorders out here are very expensive. The Ferrograph, for instance, has just gone up from about £164 to over £200, which is beyond the amateur's reach. The Clarion Transitate is £43 without the twinset, which is another £12 15s. *Yours faithfully*

. . . about tape storage

From:—T. S. Downes, Ballance Street, Shannon, North Island, New Zealand.

*Dear Sir:—*While going back over my back copies of *The Tape Recorder*, I noted in June, 1960 issue a letter from R.E.S. Bilton, regarding the problem of tape storage, in which he mentions the desirability of a metal container for ensuring the safe arrival of a recording sent over long distances.

(continued on page 99)



These photographs were sent to us by Mr. Les Thomas of New Zealand (See letter on this page). They show some of his amateur radio and tape recording workshop, and the special curtains made by his wife, with the World Tape Pals insignia in the centre, and black tape leading out to microphone symbols which carry the names of the different countries with which he is in regular contact.

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READERS' LETTERS—(continued)

I hope I am not too late to advise the correspondent that in a news letter distributed by the New Zealand Section of "World Tape Pals" a suggestion was offered that prior to sending tapes overseas to prevent them being demagnetised by contact with other electrical or magnetic materials, that the tape spool be wrapped in aluminium foil, the same grade as housewives use in cooking, before packing in the tape carton. I can state that I have used this method with success in my six years of exchanging tapes in many parts of the world, using both air and surface mails.

I find your magazine most interesting and a must for tape recording enthusiasts. I am a member of World Tape Pals and The British Recording Club. *Yours faithfully*

. . . about copyright again

From:—W. P. Copinger, 2 Seaford Street, Kilmarnock, Ayrshire.

*Dear Sir:—*You published an interesting letter from R. P. Markham "about copyright again" in your February issue. My grandfather W. A. Copinger, M.A., LL.D. published a work *The Law of Copyright* many years ago and today "Copinger on Copyright" is the leading reference work on this vast subject. It has been revised and brought up to date by Skone James and the latest edition (1958) covers the new Act of 1956 which includes every aspect of copyright in connection with recording, performing rights, definitions, what constitutes public performances etc.

Referring to Mr. Markham's letter he asks about recordings being played at his club, Society or Fellowship. This is covered under the Act of 1956 subsection (7) of Section 12 where, according to Copinger and Skone James (p. 290) ". . . the copyright in a sound recording is not infringed by its performance at any premises where persons reside or sleep, or as part of the amenities provided exclusively or mainly for residents or inmates, or if it is performed as part of the activities of, or for the benefit of, a club, society or other organisation, which is not established or conducted for profit and whose main objects are charitable or are otherwise concerned with the advancement of religion, education or social welfare. It is however provided that the exemption of premises where persons reside or sleep shall not apply, if a special charge is made for admission to the part of the premises where the recording is to be heard. It is also provided that the exemption shall not apply in the case of an organisation, if a charge is made for admission to the place where the recording is to be heard and any of the proceeds of the charge are applied otherwise than for the purpose of the organisation. This would appear to involve that no part of the admission charge may be used for administration expenses."

The Law of Copyright then gives some ideas on "organisations which are not established . . ." etc. and "social welfare." I strongly recommend anyone who is worried about copyright and tape recording to get a copy of this book published by Messrs. Sweet and Maxwell Ltd., of Chancery Lane, London.

Yours faithfully



irish



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Advertisements for this section must be pre-paid, and accompanied by a postal order, money order, or cheque. They must be clearly written or typed, and must be in the form of a separate sheet of paper if included with a letter dealing with other subjects.

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. Send replies to Box Numbers c/o "The Tape Recorder", 99 Mortimer Street, London, W.1.

All advertisements for the April issue must arrive not later than March 6th.

Situations Vacant

Technical Representative required in London with experience in the sale of magnetic tape. Apply in writing, giving qualifications, to the Sales Manager, Gevaert Limited, Great West Road, Brentford, Middlesex.

For Sale

A binder will keep your copies of The Tape Recorder clean and ready for easy reference, price 15s. posted from 99 Mortimer Street, London, W.1.

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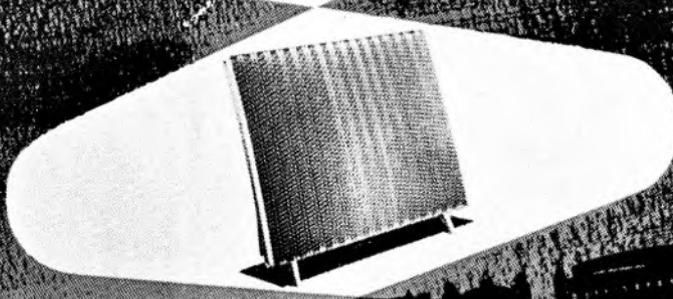
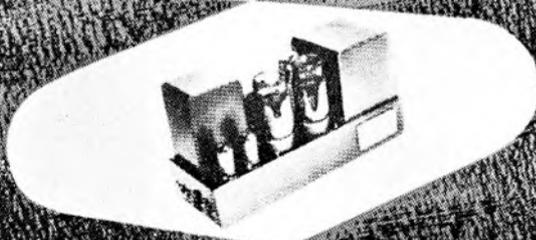
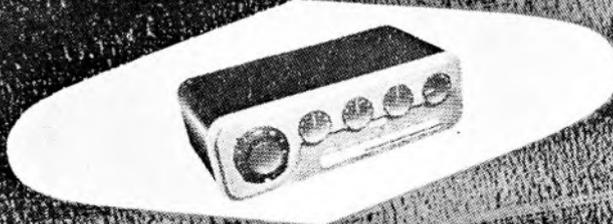
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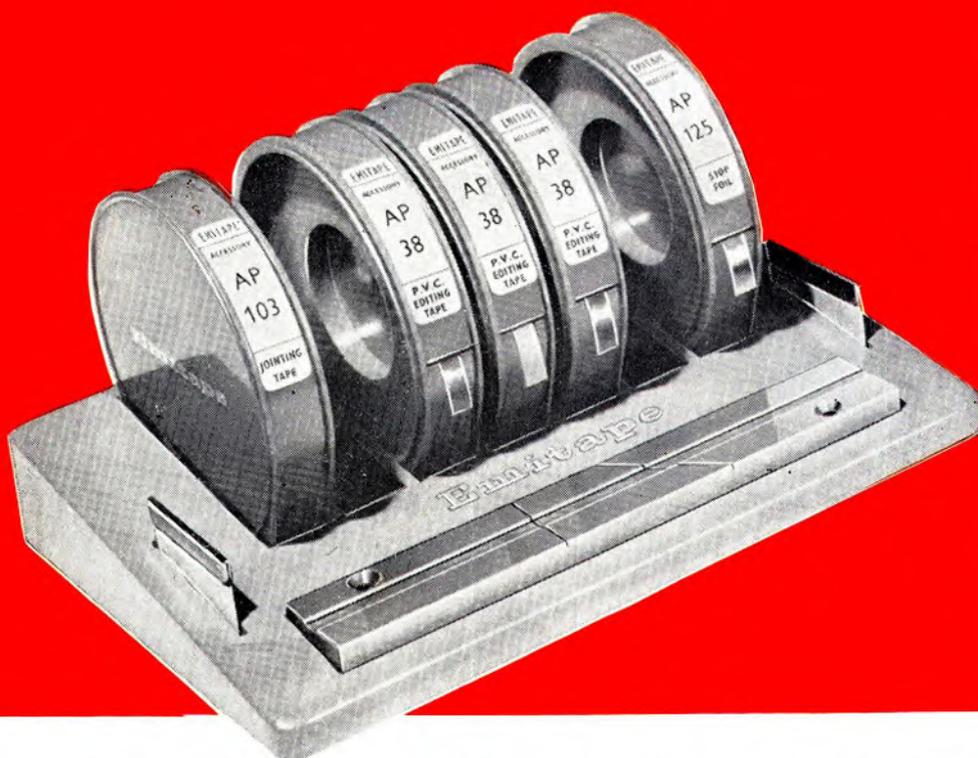
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