

# the TAPE RECORDER

PRICE 1/6

JUNE 1959  
Vol. 1 No. 5



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"Ask the  
man who  
owns one"

The man about to buy a Tape Recorder may be pardoned if—after reading some of the more extravagant claims appearing in advertisements—he finds himself in a state of complete mental confusion. We for our part have always preferred to make no claims for Ferrograph performance other than the conservative factual information to be found in our printed specifications. To us, the most satisfying and encouraging feature is the high reputation enjoyed by the Ferrograph in all parts of the world—particularly among those to whom cost matters little but to whom quality is paramount. It is a notable fact—for which we are grateful—that this almost legendary reputation has been created by Ferrograph users themselves and not by us.

"Ask the man who owns one" would seem to be singularly appropriate for intending Ferrograph purchasers. If you are seriously interested in good music—if it is your ultimate intention to build up your own personal tape library of the world's classics—if high quality recording really means something to you—if the possibilities of stereophonic sound excites your imagination, we believe that nothing less than the incomparable Ferrograph will satisfy you.



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With standard monaural Recording  
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## CHERRY BLOSSOM IN REGENT'S PARK

● The above photo, in black and white, is a reproduction of the picture which appears on the cover of the May number of "Record News" in full colour. Some months the colour photo on this magazine is closely related to discs or music; on other occasions it is not; and this is just such an occasion. But this accent on the purely decorative approach is confined to the cover only. In the review pages of "Record News" you will find the most authoritative and down-to-earth guide to your discs of music from the classical repertoire. "Record News" is "... **without doubt the finest and the most reliable review paper of its kind, anywhere in the world**". And at its price of 1/6d monthly, this finely produced magazine is also the very best value in its sphere.

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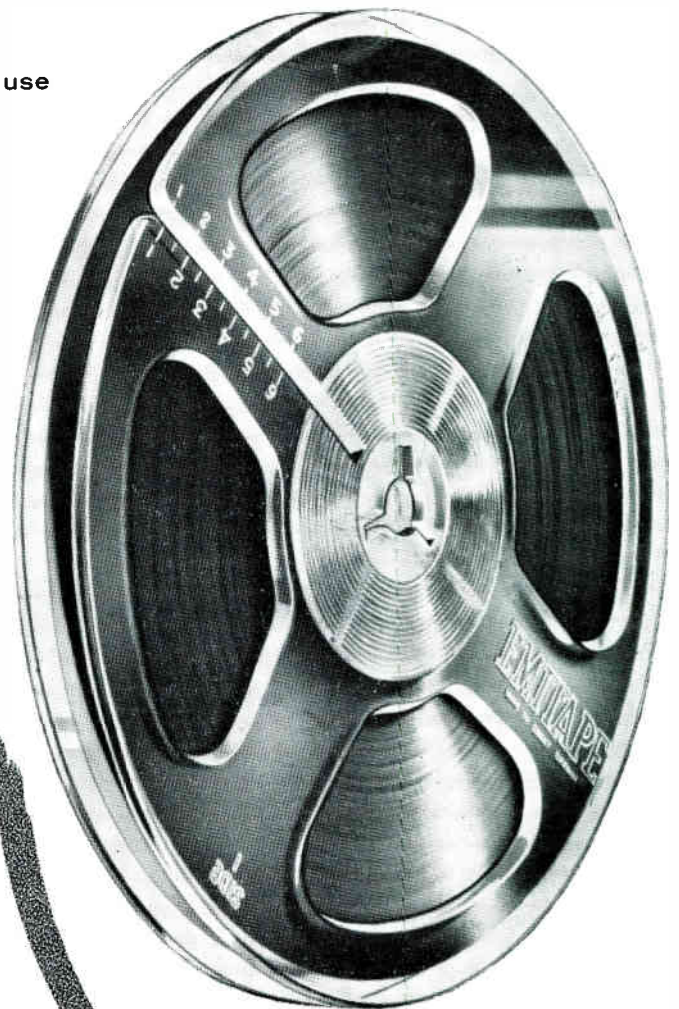
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Type No.	Title	Size	Length	Price
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44/6	"Junior "	5"	600'	18 0
44/9	"Continental "	5 $\frac{3}{4}$ "	850'	1 4 6
44/12	"Standard "	7"	1200'	1 10 0

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ES/R/76

# Hand Made . . .

This is no idle statement, it virtually sums up the REPS recorders, for high quality products such as these cannot possibly be mass produced. Our production capacity is therefore strictly limited and for this we make no apology; rather we pride ourselves that all models manufactured comply with this published technical specification.

The whole mechanism is mounted on rubber which together with careful selection of motors reduces mechanical noise to a minimum.

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.

## TECHNICAL SPECIFICATION

\*The improved 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—47dbs)

Separate record amplifier

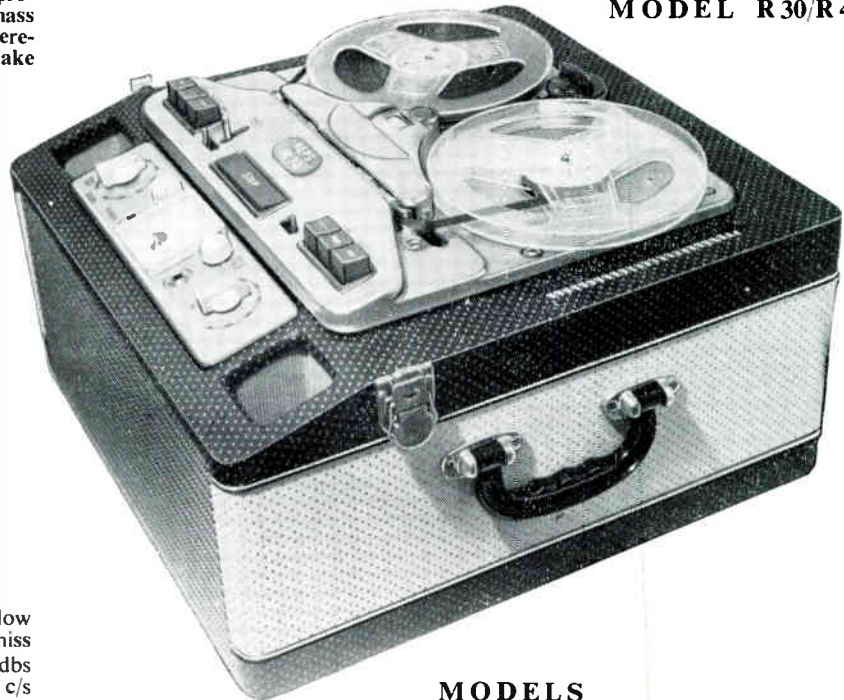
2 per cent total harmonic distortion at peak recording level 1 kc/s.

†Push-pull bias erase oscillator for low tape hiss

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' E.M.I. tape

MODEL R30/R40



## 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.

Fully illustrated literature available on request

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Please send me without obligation full details of your range of Tape Recorders. I am particularly interested in Model R.....

Mr.....

.....

.....

# the TAPE RECORDER

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## EDITORIAL

THIS month we give the first details of the first really low priced tape deck to be produced in this country (the BSR Monardeck). Within the last few weeks, too, we have received news that Garrard Ltd., will shortly be placing their own low-priced tape deck on the market. It would not be a wild guess to say that these two will be followed by others. This news is of the greatest importance because it is obviously the opening of an entirely new market, and it will not be long before manufacturers begin to receive large quantities of these decks. Tape recorders are already finding new homes at the rate of approximately 2,000 a week in the U.K., and when these new low priced tape recorders are available, the figure will probably double.

At first, this may seem to be a long way from the main subject matter of this column—the Copyright Controversy. However, second thoughts will soon show that the two are very closely allied. Ever since the first few tape recorders began to find domestic favour, some ten years ago, it became apparent to far-seeing people that their use would create serious copyright problems. Now that the tape recorder has become accepted as an every day domestic musical instrument, the problem has become seriously acute; and within the space of two or three years the position is likely to become chaotic unless very drastic steps are taken to get it under control.

In spite of the recently amended Copyright Law, the position is such that no one really knows accurately where he is going. The tape recorder user knows that he must *not do* some things but is not at all sure what other things he *can do* in safety. The manufacturers of gramophone records must themselves be in a quandary, because they are in the unenviable position of issuing discs which have cost them, in some cases, many hundreds of pounds to record, yet they are fully aware that every owner of a tape recorder can (apparently) take down and use whatever he likes for his own private entertainment. The manufacturers of the actual tape recorders are in a similar quandary because they, in their turn, seem to be involved over this copyright-cum-royalty debacle.

Because of all the many strings which are now tied to this once fairly simple word "Copyright," we felt it premature to publish any single feature purporting to set out the position in a concise form—because it seemed that such was impossible at the time of writing. Instead, we have briefed a number of knowledgeable people to express their own views on the subject, interpreting the law of Copyright as it stands, and also adding helpful advice whenever possible. The first of these articles will appear in our next number.

In spite of anything we ourselves can publish, however, and in spite of any developments concerning the law as it is, we feel that all parties concerned will do well to put their heads together as soon as possible, to see whether it is practicable to hammer out the basis of an entirely new conception of the word Copyright, as it is undoubtedly going to apply in the next ten years or so; and anyone who is at present involved in any small way—from musicians and song writers to disc manufacturers and makers of recorders—will surely see the wisdom of such a move.

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## COVER PICTURE

OUR Cover photo this month reflects the growing interest in combining the hobbies of cinematography and tape recording. The photograph was taken by Michael Swan, who contributes our "Tape and Home movies" feature on page 207, and shows Mr. Alan Pearson recording a commentary to an 8 mm. film. The Philips tape recorder is coupled to the Eumig Imperial projector in such a way that switching on the recorder starts up the projector. Many people are finding that their "Silent" films are made much more effective if a sound track is added. The bogy of synchronisation has to be watched out for of course, and the synchronising unit shown here is one of many designed to keep sound and vision accurately in step.

## NEXT MONTH

A NEW feature begins in our next number—*Readers' Problem Letters*. Those who have followed the similar feature in our sister journal, *Hi-Fi News*, will know what to expect and, more important, how to profit from it. It can become one of the liveliest features of the paper, and we hope you will contribute to make it so! Next month, also, Maurice Brown concludes his popular series, *The Art of Tape Editing*, Michael Swan has more advice on the subject of *Tape and Home Movies*, and the Beginner's Feature, *Taking Up Tape*, will deal with practical hints on microphone technique.

*News Page*, *Club Roundabout*, *Cartoons*, *Details of New Products* and *Equipment Reviews* are of course included. In addition there will be further news about our novel £300 competition, plus another supporting article explaining how to make this "New Music," around which the competition is based.

## 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).

# THEY'RE HERE!

We are proud to introduce to you the Bromley 59 and Bromley De-Luxe tape recorders. Without quoting a host of technical details that many would be unable to understand, and with no attempt at blinding you with science, we believe that these two tape recorders are very good value for your money and we'll stake our reputation upon it. We're sure you'll like 'em, and we know that you'll like the price. We make 'em, we sell 'em and you save money as no one sells 'em for us.

They won't wash the dishes, put the cat out, light Granny's pipe or spring-clean the house. They will record the clatter of broken crockery, the cat singing, Granny coughing and Dad falling off the step ladder, and what's more they'll play it all back just as it sounded. They won't give a frequency response that you couldn't hear anyway, but they will reproduce what you put on to the tape with just as much clarity.

The Bromley 59 sells at 46 gns. and the Bromley De-Luxe at 57 gns., and both are available on our no interest terms. We guarantee them for one complete year including the valves, and if you have a breakdown, we will service it for you at no cost at all to yourself. Both are complete with microphone and tape, and we will deliver them anywhere in the British Isles entirely free of charge.

We also stock the Soundcraft range of speaker enclosures, and in our opinion these are the best for their price available. Well made, mathematically designed, we know that you can't do better than complete your equipment with one of these. Want more details? Send the form below and we'll let you have them by return of post. It's worth a stamp. Go on! Do it now!

P.S.—Watch for the announcement of the opening of our new showrooms. There you will be able to see all the best in tape recorders.

---

## THE TAPE RECORDER SERVICE CO.

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Please send without obligation on my part, details of your Bromley recorders and Soundcraft speaker enclosures.

I am interested in purchasing.....outright.....easy terms.

Name .....

Address .....

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# "NEW MUSIC" COMPETITION

## — HOW TO SEND IN YOUR ENTRY —

### PRIZES WORTH OVER £300 TAPE RECORDERS-DECKS-ACCESSORIES

THE main details of this new and unique competition were published in the April issue of this magazine, and further details appeared on page 158 last month. A summary of these details will be found overleaf (page 198). Within the rules of the competition, and limited by the length of the recording and the specified subjects, the field is wide open for originality, ingenuity and presentation. Prizes of tape recorders, tape decks, accessories of all kinds, including mixers, mikes, and tapes, will be awarded equally in each of the two classes (A and B). During the next two or three months for the interest and guidance of competitors we propose to publish articles on this "New-style" music by prominent experimenters in the field. The first of these articles appears on page 213. Further news about this competition, with details of prizes, names of the panel of judges, etc., will begin next month.

#### THE RULES

1. Each coupon entitles the reader to one entry. There is no entry fee. There is no limit to the number of entries which may be submitted.
2. Readers who do not wish to cut out the complete coupon may rule out their own. But each coupon must have (gummed to it) the coded triangle snipped from a copy of *The Tape Recorder*.
3. All tape entries must be securely packed, and must have the sender's name and address (block letters) gummed to the tape spool. The entry coupon must be enclosed in its own envelope, with the spool. The package should be registered, and must be addressed as follows: New Music Competition. "The Tape Recorder," 99 Mortimer Street, London, W.1.
4. All tapes, except those which are prize winners, will be returned to their senders after judging is completed. Sufficient postage must be included, in the envelope containing the coupon, to cover this return postage by registered post.
5. Prize winning tapes shall become the property of the proprietors of this magazine (*The Tape Recorder*), and the Copyright of the recorded material on them shall become the property of the proprietors of *The Tape Recorder*, who shall thus be free to use this material in any way. In the event of a sale, or hire, or licencing of this material by the proprietors of *The Tape Recorder*, an amount which shall not be less than eighty per cent. of the nett proceeds, as received, will be handed over to the entrant of the tape concerned.
6. No Copyright material must be used for the production of the recording which forms any entry for this competition.
7. Entries must be recorded on standard  $\frac{1}{2}$ -inch magnetic tape. The tapes may be of any brand (Normal, Extra Play or Double Play), and may be recorded  $\frac{1}{2}$ -track or full track, at any of the following speeds. 15 : 7 $\frac{1}{2}$  : 3 $\frac{1}{2}$  : 1 $\frac{3}{4}$  inches per second. The recorded speed must be entered on the coupon, and the tape will then be played and judged at that speed.
8. Entries must not exceed the maximum permissible time of the actual recording, which is Two Minutes. They must likewise not be of less than 30 seconds in duration.
9. Entries may be sent in by individual readers, or by schools, clubs, or groups of people. The "Entrant" shall be deemed to be the name on the coupon, and attached to the spool (as in Rule 3), and these two names must be identical.
10. Any of the 5 listed subjects may be entered in either Class (A or B). Class A is for entries for which one tape recorder only has been used. Class B is for entries for which two or more recorders have been used.
11. No correspondence can be entered into, with regard to entries, before the date of judging, which will be announced later in this magazine. The decision of the judges shall be final and binding.
12. Though every care will be taken of tapes and spools submitted by competitors, no responsibility will be accepted by the Proprietors of *The Tape Recorder* for loss or damage.
13. Tape entries will not be refused if joined or spliced, but competitors are advised, for their own interests, to submit unspliced copies.
14. The completion of the coupon (which must be signed by the individual entrant, or by the Secretary in the case of Club entries, or by a master or mistress in the case of school entries) shall be a declaration that all the above rules have been read and agreed to.
15. The closing date for entries is October 7th, 1959. No entries will be accepted after the last postal delivery of that date. Proof of posting will not be accepted as proof of receipt. Competitors are advised to send their entries per registered post.

#### THE SUBJECTS

1	<b>INTERVAL SIGNAL</b> For a broadcasting station.
2	<b>SOUND TRACK FOR FILM OR TV.</b> Advertising Holiday Camps or Foreign Travel.
3	<b>THEME MUSIC</b> For use in part (or parts) of an "X" Certificate Science Fiction Film.
4	<b>ADVERTISEMENT SOUND TRACK</b> For a new detergent, for use on Film or TV.
5	<b>A COMPOSITION</b> To be listened to for its own sake, and not as an accompaniment.

## "NEW MUSIC" COMPETITION

I/WE ENCLOSE AN ENTRY IN THIS COMPETITION AS FOLLOWS:

CLASS <b>A</b>	CLASS <b>B</b>	SUBJECT					
		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 20%; text-align: center;">1</td> <td style="border: 1px solid black; width: 20%; text-align: center;">2</td> <td style="border: 1px solid black; width: 20%; text-align: center;">3</td> <td style="border: 1px solid black; width: 20%; text-align: center;">4</td> <td style="border: 1px solid black; width: 20%; text-align: center;">5</td> </tr> </table>	1	2	3	4	5
1	2	3	4	5			

**[PLACE AN INK CROSS BOLDLY IN THE APPROPRIATE BOXES]**

RECORDING SPEED .....i/s	I/WE AGREE TO THE RULES (1 to 15) PRINTED ABOVE
— ENTRANT'S FULL NAME & ADDRESS —	

N.M.  
COMP.

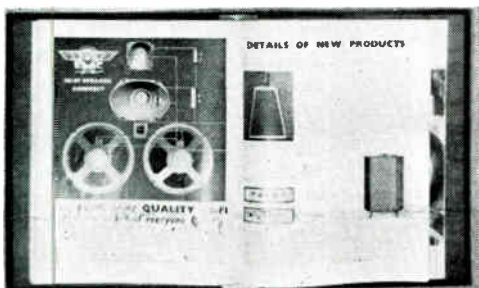
I ENTRY

SIGNATURE .....

OR COPY THE COUPON AND CUT THIS →

(Continued overleaf)

# WHY NOT FILE THEM ?



Your copies of *The Tape Recorder* can be stored in good condition in these semi-permanent binders. The numbers build up month-by-month in the binding case, and become a complete volume, plus annual index, for ready and easy reference. The pages open flat at any place. Binders for Volume One are now available from the address below, price 15s. post free. The covers are of stiff board, black buckram covered, and gold-blocked on the spine with title and volume number.

★  
P.T.O.  
COMP.  
N.M.C.

## THE TAPE RECORDER

99 MORTIMER STREET  
LONDON, W.1

## MORE COMPETITION DETAILS

Readers of the April and May issues of "The Tape Recorder" who have now studied the Competition Rules overleaf are all set to get cracking on this most creative application of tape recording. For the sake of new readers, we are summarising some of the information given earlier.

### What is this New Music?

Briefly, this is a competition in artificial music—that is a montage or sequence of sounds, built up by the manipulation of tape recorders and electronic circuitry; the total composition must be one that cannot be arrived at in any other way. That is to say, individual sounds may be employed which are *natural* such as rhythmic drumming, musical instruments, or even a tap dripping, or *electrical*—such as an audio oscillator, or our old enemy mains hum. But the blending and putting together are all important. The judges will be on the look-out for imaginative, inventive, ingenious, and, above all, original handling of the medium of "*musique concrète*."

Given the skill, there is truly no limit to the extent to which this New Music could be developed. It could even be cast with all its unconventional sounds, into the conventional form of a symphony or a concerto. In its simplest forms, produced with the use of a single tape recorder, it can take shape as short lengths of pleasing rhythms and tunes. And because of this very big gulf—between the simplest and the most complex—we have decided to frame the competition so as to make it equally fair to all. For this reason we have introduced the two classes of entry—Class A using a single recorder, and Class B for two or more recorders. You will notice from the rules that any number of people may co-operate in either of the classes.

### Make a Plan

Competitors will find a great deal of useful information in the articles by professional exponents of *concrète* music in this and subsequent issues of "The Tape Recorder." As a general guide, however, we suggest the following plan of action:—

1. Decide on the theme.
2. Decide on the duration (we have fixed a *maximum* timing of two minutes overall, but a shorter piece might easily win first prize).
3. Decide on the initial sounds to be used (the short answer to this is *anything*, but the theme will sometimes suggest a good starting place, e.g. For a composition about Antarctica, you might experiment with a number of brushes on different surfaces, to be recorded and speeded up or slowed down to give the eerie quality of polar blizzards. *Note:* It is the quality of the effect rather than a realistic imitation which we are after. Or, again, you might think of creaking ice floes, or walking in crisp snow, and experiment by munching sugar lumps close to the microphone, and so on.)
4. Decide how each sound element is to be built up. (Operations which may be performed on the basic sounds include filtering, speed changing, echo effect, reversing, editing, mixing, superimposing, and the making of loops).
5. Decide the overall shape, and go ahead.

### CHELTENHAM

You are invited without obligation to visit our High Fidelity Showroom to hear Monaural and Stereophonic Sound. Demonstrations on the following equipment:

TAPE RECORDERS—FERRAGRAPH, REFLECTAGRAPH, SIMON, BRENNELL, FI-CORD, TELEFUNKEN, GRUNDIG, STELLA.  
AMPLIFIERS—QUAD, LEAK, RCA, ROGERS, AVANTIC, ARMSTRONG, PILOT.  
PICKUPS—DECCA STEREO, CONNOISSEUR, Lenco, RONETTE STEREO.  
TRANSCRIPTION DECKS—GARRARD 301 and 4HF, Lenco, COLLARO.  
SPEAKERS—WHARFEDALE, W.B., GOODMAN, TANNOY, QUAD, AVANTIC.  
MICROPHONES—RESLO, SIMON CADENZA, LUSTRAPHONE, HARTING, ACOS.

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BY NANCY JAY

# A WOMAN TAKES UP TAPE

● Every married photographer will smile at Mrs. Jay's summary of the holiday preparations. They are so terribly true! But we hope that many hobby widows will read this article, and follow up her discovery. The female of the species is as useful as the male!

I used to think that tape recording was all technicalities, and that there was no fun in it for a woman. In fact my husband's array of professional equipment left me baffled. Like most of my sex I suffer from a practical streak; I like to know where all this is getting us, so I have never been interested in hum hunting for its own sake, or listening in rapt ecstasy to unadorned test frequencies, however technically perfect.

Then we acquired one of the new miniature tape recorders that you run off batteries. Here was something light enough for me to carry anywhere, and simple enough for even me to understand. I fell for it right away, and when last year we packed for a short Indian Summer holiday, I insisted on taking it along. I thought it might be worth while trying to collect some live sounds to help out the colour transparencies we intended to take on our trip.

## The Male Still Takes the Pictures

I should explain that my husband is a keen photographer, and our holiday luggage has always included the vast amount of camera gear that appears to be necessary for even a simple snapshot. And as other photographers' wives will know all too well, a large part of their holiday consists of acting as a cross between an unpaid model and a beast of burden—a typically male and thoroughly one-sided arrangement. However, last year was different. For once we set out on equal terms: he looked after the pictures, and I took care of the sound; a bit of team work that resulted in a holiday more packed with interest and fun than any I can remember.

Looking back, I can report that the idea paid off handsomely. I can recommend it to other Hi-Fi widows, and to any photographer who wants to add a new interest to his projection sessions. Of course, you can't always choose subjects for the camera that suit the tape recorder too, but it is surprising how even the most amateur on-the-spot sound effects will stop your audience from developing the fidgets after the first half dozen slides. And if the worst comes to the worst, you can always record a few words of commentary to go with the picture on the screen.

## Independent Action, Too!

For me, however, half of the fun of the miniature recorder lay in making my own independent sound pictures of the journey. There was the rainy night when we pulled in at the car park in Shrewsbury. Photography was out of the question, but the thin wail of a cornet drew me to the Market square to tape a real collector's piece, provided by a small but gallant group from the local Salvation Army. Take five mixed voices and one cornet in unison, record them against a background of the wet hiss from the tyres of passing cars, add the timely chiming of a market clock, and you get a picture of a wet Saturday night that you can see with your eyes shut.

From the rain-swept streets of Shrewsbury we escaped across the border to a fine Sunday morning in Llangollen where we were wakened



*The Author with two of her "subjects". A gate-keeper on a Lakeland pass, who recited some of his own verses in Cumberland dialect, and the son of the local shepherd.*

by the pealing of bells from the Parish Church. These, with a few lines of commentary, went on to tape and were followed in the afternoon by a recording of part of a concert given in the Park by the local brass band. Put a handful of Welshmen together and the result is inevitably music. This band consisted of boys and girls from fifteen years to seventy, all good citizens of Llangollen, giving up their Sunday to entertain the rest of the town with their playing—and playing jolly well too, as our tape is ready to confirm.

A local legend has it that in Llangollen lived the real Mary of the *Little Lamb* nursery rhyme. Whether this is true or not, the story as told to us by a native in a musical Welsh accent gave us a tape that is worth hearing for its own sake.

From the bridge over the Dee in Llangollen I taped the sound of the river foaming over the boulders below, while the other half of the team took a photograph of the scene from the same spot, showing the valley with the autumn colours on the hills rising behind. From the bridge, too, we noticed what appeared to be a mill, and went off to investigate.

## Through the Mill

We were right, and the miller, Moldwyn Jones—who may have been related to that other "Jolly Miller who lived on the River Dee" for all I know—provided us with a worth while tape in telling us about the mill. We learned that this is one of the few remaining water mills in Britain still actually used for grinding corn, and we gladly accepted an invitation to visit the wheel pit where the enormous water wheel recorded its own story for us in sound and picture.

Our itinerary took us over the Honiston Pass, where we made more "double-barrelled" records. The sounds I recorded of the mountain stream chuckling over the stones, and the whine of gears as passing cars breasted the 1 in 4 section of the hill bring back a picture of September sunshine on heather more vividly than any colour film alone could do. But with both sound and vision, we can bring back that holiday in the middle of December.

Of our days spent among the Lakes, one episode shows what we should have missed without a tape recorder. A few miles out of Keswick we located an old gate-keeper on a mountain pass, who is an authority on the local bird life and a considerable philosopher and poet. He chatted to us about the various birds that came to his call and I was able to persuade him to recite one of his poems in the Cumberland

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## Aren't there risks to you in such a scheme?

*Of course there are! But none to you! We'll cover ourselves by offering this GO plan initially up to August 31st. A full twelve months service if you come in now, but you may not have the advantages of the scheme, after that date.*

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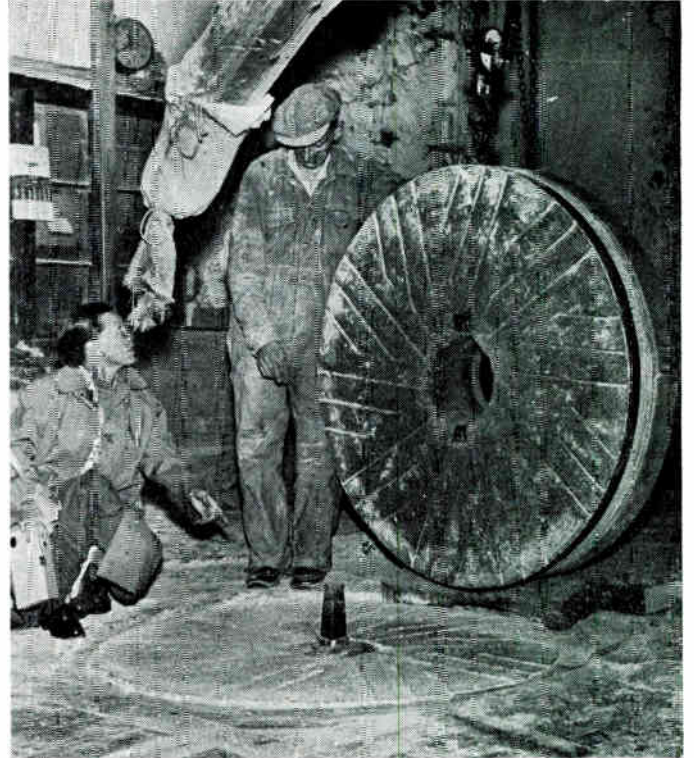
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## A WOMAN TAKES UP TAPE—(continued)

dialect. With him was the local shepherd's little son who began by being suspicious of the contraption slung around my shoulder, but soon lost his shyness in telling me all about life on their hillside farm.

Later in our holiday we stopped in Newcastle-on-Tyne. It was again Sunday morning, and the tape I made of St. Nicholas's Cathedral gains much in atmosphere from the sound of the footsteps of the church-goers on the cobbled side street and the muted noise of distant traffic crossing the Tyne Bridge. Then, within the sound of the



*For the record, the miller explains how one of the few remaining British watermills is used for grinding corn. Note that the microphone has been clipped to the lapel of the author's raincoat.*

bells, we came across something quite different—the traditional Sunday morning market on the Quayside. How long this market has been in existence is lost in history, but you couldn't find a better subject anywhere for film or tape—especially tape.

From this Tyneside Petticoat Lane I took home some wonderful examples of the barker's art in a variety of dialects that ranged from Gravesend to Glasgow, and now, with a turn of the switch, I am back on the quayside, listening to the hoarse-voiced salesmen of purple Teddy Bears, alarm clocks, candyfloss, china dogs and cellophane bags of scarlet and yellow boiled sweets—"Not 'arf a crown, not two bob, not one and six; there y'are lady, a bob the lot!"

. . . and then the fun really began

We arrived back with enough raw material to keep us busy through the whole winter. During the hours my husband has spent in the dark room developing, printing, enlarging—and waiting for colour films to be processed, I have been happily engaged in playing over my tapes, adding introduction, commentary and continuity where necessary. I don't need a dark room or chemicals; I can do everything on my side of the job with a pair of scissors and a roll of splicing tape. I don't have to wait for the tape to be processed or printed—I can call back my holiday at the flick of a switch. And whereas the camera, at its best, is only capable of turning out a reproduction, my tape recorder gives me the real thing. And for women who, like myself, are more interested in the end than the means, this surely is the big attraction of "miniature tape recording".

**The Tape Recorder — Place a firm order**

## G.P.O. visit Elizabethan



**E**.A.P. (Tape Recorders) Ltd. recently played host to a party of Post Office engineers. This group of communications experts was shown round the Romford factory by Mr. Molen, the general manager, and they were able to inspect all stages in the manufacture of the Elizabethan range of recorders. Particular interest was shown in the new miniature Bandbox model, and many members of the party were clearly fascinated also by the intricacies of the more elaborate machines, such as the Essex.

## Win a Tape Recorder Competition.



**T**HE Birmingham Evening Despatch recently held a "Win a Tape Recorder" Competition, the first prize of which was a Telefunken Tape Recorder. There were over 8,000 entries for this competition, and they had to put the various advantages of a tape recorder in the correct order.

The Telefunken Tape Recorder was presented to the winner, Mr. E. Knight of 12 Shutlock Lane, Moseley, Birmingham, on Saturday, April the 11th, in the Hi-Fi and Tape Recorder Showrooms of Jewkes & Co. at Broad Street by Mr. V. W. R. Smytheman, the Managing Director.

The photograph shows Mr. V. W. R. Smytheman, presenting the Tape Recorder to Mr. Knight, with his brother Mr. D. R. Smytheman, a director of Jewkes & Co. Ltd. on the left.

## Ampex Recorders now made in England.

**A**MPEX Corporation of California have formed a U.K. subsidiary company, Ampex Electronics Ltd., for the purpose of manufacturing Ampex equipment in this country. Dr. Peter Axon is managing director.

The factory is situated at Reading Industrial Estate, Whiteley Kiln, Reading. Initially the factory will assemble analog instrumentation tape recording equipment, the electronic assemblies will be supplied by English manufacturers and the tape transports, recording heads and certain other components will be supplied from America. It is intended eventually to use the maximum number of English made components. Research and development work will also be carried out in conjunction with the parent company.

Equipment from Reading will be installed and maintained by the company's own technicians. Final assembly operations were expected to begin in May. In addition to the production of tape recording

# NEWS PAGE

equipment Ampex Electronics will co-operate in the marketing activities of existing U.K. distributors, Rank Cintel Ltd. and Southern Instruments Ltd.

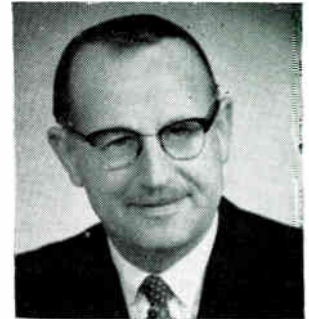
Rank Cintel are the U.K. distributors for Ampex professional audio recorders and home music systems, also the Ampex VR-1000 Videotape recorder, over 300 of which are now used by Television companies throughout the world.

Southern Instruments handle the range of multi-track analogue and digital tape recorders of which there are 14 basic designs.

## G.E. Spark joins Garrard.

**I**N view of the forthcoming entry of the Garrard Engineering and Manufacturing Company Limited, into the Tape Deck field, Mr. G. E. Spark will be joining the company as Sales Manager of this division on June 1st.

The new Tape Deck is now being tooled and will be exhibited at the Radio Show at Earls Court in August.



## Nation-Wide Service

**C**ONTINUING their intensive tape recorder sales drive, Walter Instruments Ltd., of Morden, Surrey, announce a list of 75 approved service centres, in 65 towns and cities.

This means that users of Walter tape recorders in England, Scotland, Wales and the Channel Islands, will now have an official service centre locally or within a reasonable distance.

## News from Grundig

**G**RUNDIG (Great Britain) Ltd., enjoyed a very welcome visit from fourteen members of the Etessa Tape Recording Club at their Sydenham Factory just before Easter. Etessa, whose members are drawn from the staff of the Cable and Wireless Section of the G.P.O. are keenly interested in all aspects of tape recording, and those members who were able to be present gave the Grundig staff a busy afternoon answering a wide variety of questions. After a tour of the various departments the visitors had tea in the Canteen when Mr. V. P. Cole, Grundig's General Sales Manager, was present to answer queries.



● *Watching the final checking of Grundig recorders.*

On May 22nd Grundig are spending thousands of pounds on a nation wide advertising campaign for the TK25. Advertisements will appear in evening papers in London, Birmingham, Liverpool, Manchester, Newcastle, South Wales and Yorkshire; many will be full page and the smallest a half page. This will be backed up by pictorial features in the papers concerned and special displays at local Grundig dealers.



*This old man is a full-grown bull seal ashore on the Brownsman, just off the coast of Northumberland.*

OF the many recording expeditions that Bob Wade and I have undertaken, one of the most fascinating was to the Farne Islands. These are a group of islands lying off the coast of Northumberland, and some ten miles to the south of Berwick-upon-Tweed. The actual number of islands is dependent on the state of the tide, and varies between about fifteen to twenty-eight. The largest is the Inner Farne; at low tide its area is about sixteen acres of which eleven or so are just bare rock.

Bishop Aidan came to the Inner Farne in 651 to pray, but it is the name of St. Cuthbert which is inextricably linked with this island. Here he spent some nine years in meditation, and carried out the first attempts at bird protection. He gave his special protection to the eider duck and ordered visitors to the island not to disturb it during the breeding season. Even today this bird is known as St. Cuthbert's duck, and it is as tame as it was in the times of the early writers. On 20 March, 687, St. Cuthbert died on the Inner Farne and this island became a place of pilgrimage as a cradle of Christianity in Britain.

#### Co-operation by the National Trust

Today, the islands are vested in the National Trust; and it was through the kindness and help of the Trust that we were able to make our visit in July, 1955. We were anxious to make recordings of some of the myriads of sea-birds which nest safely on the islands. We loaded all our equipment—recorders, parabolic reflectors, drums of cable, batteries and tapes—on to a Northumberland cable lying in Seahouses harbour, and under the command of Mr. Shiel. We made our landing on the Inner Farne, just below Prior Castell's tower and the Fourteenth Century Chapel. Above our heads hovered hundreds of arctic terns, watching our activities with the greatest of interest.

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# RECORDING

## part two:

The apparatus was successfully humped across the slippery sea-weed and on to the top of the island, gay with thrift and sea-campion.

The cliffs on the south and south-west of the Inner Farne are from seventy to eighty feet high, and here many kinds of sea-bird were nesting. In one gully were scores of nests of the kittiwake—a true oceanic wanderer that comes ashore in late March to nest on lodgments and rock ledges often above deep water. The kittiwake is one of the smaller gulls and is very socially inclined, choosing to nest in colonies, from which pours out an almost incessant clamour of calls. Our intention was to make records of the complete vocabulary of this bird—something which had not been attempted before. After I had decided that a little group of nests some forty feet away and across the gully would offer the best chance of success, Bob and I carried the recorder (a DC operated machine) across the island top, together with a battery, a hundred yards of microphone cable and an 18-inch parabolic reflector. I carried the reflector down into the gully and focused it on two nests close together. After everything had been connected and was found to work we began our patient wait.

#### A Day with the Kittiwakes

We spent a whole day working with the kittiwakes. The machine captured many of the typical "*kitti-waak*" calls and a whole range of variations. One bird began with a single call repeated thirty times or so, then made it into a double note, toyed with this for a minute or so and then built its utterance up into a full blooded "*kitti-waak*" note. The whole performance lasted for nearly four minutes and showed us quite clearly the various components of this call. Four other notes were also captured; in the evening I removed the reflector and lashed an ordinary open microphone to the end of the cable. Then with great care I lowered it over the cliff-top, and down towards a nest with two chicks some fifteen feet below. These two baby kittiwakes were hungry little birds and were always opening their mouths to beg for food. These cheeping notes were soon recorded, and after only ten minutes the adult came into the nest and called vociferously.

#### White-waistcoated Gullmots

The kittiwakes were not the only birds nesting on the Inner Farne. On the rock ledges were gullmots with white waistcoats and brown backs, conversing with harsh croaking "aarrs", and shags that belched bucolically at the slowly lowered microphone. Near the cliff-tops were little parliaments of comical puffins with great triangular red, blue and yellow bills. These I stalked across the sea-campion with the reflector, and was finally rewarded by getting a recording of their rolling, growling calls as some of them took off towards the sea far below.

#### The Terns Raise Objections

The visitor to the Farne Islands in July is always struck by the vast white clouds of terns that skim and swoop above his head, and if he is careless he may be struck in quite another sense. The breeding areas of the arctic, common, Sandwich and roseate terns were marked off, and visitors are kept strictly to pathways between the colonies among the sea-campion. However, patrolling arctic terns may make an attack upon you from behind, and they are extremely adept at it. Once I was carrying the reflector in one hand and a hundred yard drum of cable in the other; this prevented me from guarding my head; and in two minutes seven attacks were made upon me. Each time the

# VOICES OF BIRDS AND BEASTS

## *a trip to the sanctuary of st. cuthbert*

bird, struck from behind with its bill, rolled forward to avoid breaking its neck, and then flew off.

Although the arctic tern is only fifteen inches long, it can draw blood and when I had completed my journey Bob, with great glee, took a colour photograph of my blood-bespattered head! When the birds attack they make a strange high-pitched call—"kr-kri-kre"—and, as they swoop into the attack, give vent to a harsh rattling note just like a distant machine-gun. I was anxious to record this attack and tried a number of times with the reflector held in my hands so that I could follow the bird in flight. Always the attack was made from the back of the head and, although I tried walking backwards, the birds were never deceived.

I soon found that I could not swing the reflector fast enough, and I asked a student who was staying on the island if he would act as a target area while I stood with the reflector a little distance away. This he agreed to do and we soon had some first-class recordings. Only when we had finished did I discover that he was not an ornithologist and could not stand terns at any price! For those who are not familiar with arctic terns the dodge to avoid direct assault is to carry a piece of stick or bracken above one's head.

### The Seals' Breeding Ground

On the Farne Islands is an important breeding station of the grey Atlantic seal. Although seals can be seen outside the breeding season on such islands as the Crumstone, Megstone and Longstone End, it is in early November that they haul up on the rocky ledges of the Brownsman, Staple Island and the North and South Wamses, on ledges which slope gradually down to the sea. It was our watch for the seals that took Bob Wade and myself to the Brownsman island at the end of the first week of November, 1955. Here, in a tremendous swell, we manhandled all our equipment off a Northumberland coble on to a steep and slimy rocky ledge, for there was no proper landing place on the then uninhabited Brownsman.

### The Home of Grace Darling

Our base was a cottage to which in 1815 had come William, father of Grace Darling, to keep the Brownsman Light. Here Grace spent eleven of her girlhood years, until the Light was finally extinguished and the new Longstone Light illuminated on February 15th, 1826. The Brownsman is about ten acres in size, bare of trees and shrubs, and with extensive areas of rock. The top was covered with a thick carpet of peat and sea-campion with some plants still in flower in November. Many birds were arriving over the North Sea from the Continent—thrushes such as fieldfares, blackbirds and redwings, starlings, chaffinches, bramblings, skylarks, woodcock, snipe and herons. Three predators—a peregrine falcon, a merlin, and a sparrowhawk—were feeding on the tired migrants, and Bob actually touched a peregrine as it alighted on a stone wall with a lark in its talons. In its fright the falcon dropped the lark into his hands unhurt.

As we stood outside our cottage we could hear the strange songs of the seals which had already hauled up on the Staple Island next door—songs that with the roar of the sea were to be with us day and night for a week. On the south-east corner of the Brownsman were 7 or 8 bulls, some 25 cows and 19 young ones—or pups. On this exposed corner the strong wind pounded the sea into a raging surf, and so we had to wait for a bull seal to come ashore on the north-east corner of the island. At last a great bull, some 600 pounds in weight, came into a sea-weed covered cove, sheltered from wind and tide. We

recorded him puffing with his efforts to drag his fat and blubber into the cove.

Once the bull had taken up his territory some of the cows joined him, and one of them gave birth to a creamy-yellow pup covered with a soft, silky fur. When two days old the pup would call to its mother with a long repeated anxious note. The cow would answer her pup from the sea with a mournful, wailing call, and we were able to record these exchanges with an eighteen inch parabolic reflector; if we went too near the pup as he lay on his back he would roll over and hiss savagely, while great tears welled up from his eyes and ran down his face. Sometimes the cow would call as her head was about to disappear beneath a wave and her wailing note would change into a strange gurgling sound.

### Enter Junior!

I watched a pup being born on the Brownsman just below high tide mark, and the whole process took exactly 14 seconds. The newly born pup lay quietly just above the surf and then a wave broke on the rock and the undertow swept the pup off its ledge and out to sea. Although only four minutes old it swam; but it was two minutes before the cow realised that anything was wrong; then, with a tremendous leap, she crashed into the foam and swam to the seaward side of the pup. The long silky coat of the youngster was getting waterlogged but after twenty minutes the cow succeeded in breasting the pup forward into a crack in the rocks. Here she lay down and allowed the sea to break on her broad back and this prevented the pup from being carried out again. Ten minutes later she suckled the pup for the first time. Seal milk is rich in fat, and the pups which weigh some 28 pounds when born add some four pounds to their weight every day and some two inches to their girth. Nine or ten days after birth darker fur begins to appear and the pup moults. Then after three weeks, starved by the cow, it has to make its own way down to the sea and look after itself.

### The Colony Life of the Seals

Some ten or fourteen days later the cow mates again, so that the activities of birth and reproduction are telescoped into the shortest period possible. This means that the adult seals are only ashore for a brief period for it is at this time that they are the most vulnerable.

It was a thrilling experience to see these animals at close range, to study their territorial fights, and to watch pups asleep on their backs or idly scratching themselves with wandering flippers. When, at last, we took to the boat once more we were surrounded by adult seals which looked up from the sea like mournful dogs and serenaded us with their eerie songs.

**Next Chapter:** The Land of the Griphon. The story of five weeks in Spain in search of bird-sounds and music.

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# *Elizabethan*



# TAKING UP TAPE

## Part 5: MICROPHONES

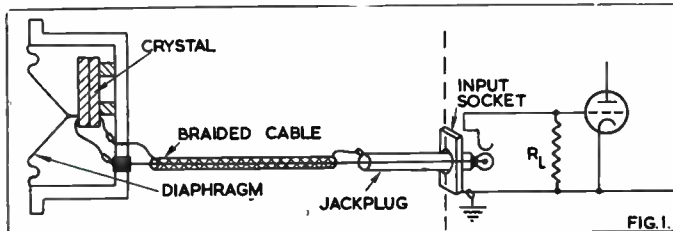
NOW that we have taken a quick look at the recording and playback chains in outline, we are in a position to examine some aspects of tape recording in a little more detail. I suggest we focus our attention first of all on the microphone. If you have only recently taken up tape, then the chances are you have acquired a machine in the £30 to £55 range—referred to by professionals in a superior manner as *domestic*, and by the rest of us as *general purpose*.

The less expensive recorders do not usually include a microphone in the advertised price, but invariably there is a particular microphone which is recommended for each machine, and I suppose 99 per cent. of customers fork out the extra cash on the spot. This is quite sensible, of course, since both the manufacturer and the dealer will take care to recommend a microphone which matches the recorder's specification. By this I mean that the output voltage and impedance of the microphone correspond to the input required by the recorder, and I shall have more to say about these in a moment. No doubt the stipulated microphone will match the recorder in that other important requirement too—the price. No responsible person is going to talk you into buying a £40 microphone for a £30 tape recorder.

All the same, as you gain a little experience you will find that sticking to a single microphone does limit the kinds of recording that you can do, and I hope in this page-and-a-half to supply enough information to help you to identify the type of microphone you already possess, and recognise which other types will work satisfactorily with your machine.

### Crystal Microphones

The majority of low-priced recorders are sold with a crystal microphone, and indeed some of them will hardly work with any other type. This microphone works on the piezo-electric principle. That is to say the fluctuations in air pressure above and below the prevailing atmospheric pressure, which constitute a sound wave, produce an alternating stress on one or more crystals of Rochelle salt. This material has the property that a bending force applied on a particular axis creates a difference in electrical potential between opposite faces.



As fig. 1 shows, this means that a voltage can be made to appear across two terminals. The oscillations due to a sound wave generate an alternating voltage.

This alternating voltage—by some magic which even hardened engineers regard as a recurring miracle—contains all the information we need to identify the original sound. Its frequency corresponds to the number of vibrations per second of the sound source—which gives us the musical pitch; and its strength corresponds to the amplitude or extent of the swings in air pressure—which gives us the loudness. I have even known a music critic say that when listening to a particular recording he could make out the maker's name on the piano! One piece of information that is missing from the output voltage of a single microphone is of course the direction from which the sounds are coming. This is the special province of stereophony, and needs a minimum of two collectors of sound.

Referring again to fig. 1, the most usual form of connection between a crystal microphone and the recorder is a length of screened cable. This consists of a single central wire covered with plastic or rubber insulation, around which is a screen of braided wire. At the microphone end, the inner conductor makes contact with one face of the crystal element, and the screening with the other. Inserting the jack plug into

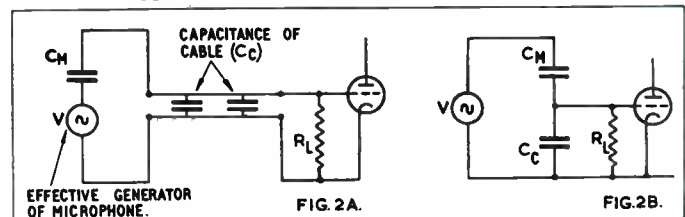
the recorder mic. socket connects the screen to earth, and the "live" wire to the grid of the amplifier (provided the jack has been wired the right way round).

### Electrical Characteristics of Crystal Microphones

Crystal microphones have two great advantages. They are inexpensive, and they produce a large output signal for a given sound intensity. Speech at an ordinary conversational level about 2 feet from the microphone (corresponding to the standard sound pressure referred to in manufacturers' specifications as 1 dyne/cm<sup>2</sup>) will produce a voltage of anything up to 0.01 volts, depending on the type.

It has to be admitted, however, that crystal microphones have their disadvantages too. And one of these is that they cannot usually be used on a long lead. To explain this, we need to know a little more about the electrical characteristics of this type of microphone.

In effect, the crystal element presents the appearance of an electrical generator in series with a small capacitance, of the order of 0.03 microfarads. Without getting more involved in technicalities than we can help, you will probably appreciate that there is a certain amount of capacitance between the inner and outer wires of any connecting cable. This appears in parallel with the microphone, as I have shown



in fig. 2a, and in the redrawn version fig. 2b, you will see that the two capacitances form a kind of voltage divider across the generator. Every additional foot length of cable increases the value of C<sub>c</sub>—and reduces what we call its impedance—the net result of which is to diminish the voltage fed to the amplifier. Crystal microphones are usually supplied already wired to a 6 or 10 foot cable, and increasing the length much beyond this will seriously reduce the available signal.

Looking again at fig. 2, the value of R<sub>L</sub> is also found to be quite critical. You will no doubt know that combinations of resistors and capacitors form the basis of the ordinary tone control circuit, and the arrangement we have here will introduce noticeable loss of bass if the impedance R<sub>L</sub> falls below that of the combination of C<sub>m</sub> and C<sub>c</sub>. It is for this reason that manufacturers specify a certain minimum load impedance for their microphones—usually of the order of 1—5 Megohms—and the "High Impedance" input of recorders should be checked as being of this value or higher, if loss of low frequencies is to be avoided.

Another minor handicap of crystal microphones is that they cannot withstand excessively high temperature or humidity. This prevents their use in the tropics, and also under the bright lights of television studios.

### Moving Coil Microphones

The second most popular type of microphone is the moving coil. This depends on the electromagnetic principle. Vibrations set up in the diaphragm, due to the alternating air pressure in the sound wave, cause a coil of wire attached to the diaphragm to oscillate in the field of a permanent magnet. The voltage generated in this way appears across the output terminals, just as in the case of the crystal type, but there are a number of fundamental differences between the characteristics of the two types.

First of all, the impedance of the moving coil element is very nearly a pure resistance, and is comparatively low, perhaps 20 ohms. The actual voltage generated is low too, compared with that of a crystal microphone. For a sound pressure of 1 dyne/cm<sup>2</sup>, which we said earlier was an acknowledged reference level approximating normal

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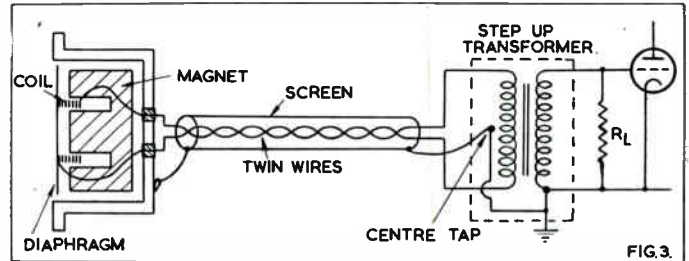
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### TAKING UP TAPE—(continued)

speech at a distance of 2 feet, a moving coil microphone produces about 0.0001 volts.

Secondly, the cable on a moving coil microphone may be extended in length to 100 feet or more. Because the output is at such a low level, it is more important than ever to avoid picking up noise or induction from the power wiring etc. It is common practice, therefore, to use what is called a *balanced* connecting cable for moving coils. This



consists of twin insulated wires, as shown in fig. 3, and prevents interference since equal voltages will be induced in the two wires by any stray magnetic fields, and will cancel each other out. A screen of braided wire is usually included, connected to the case of the microphone at one end, and to an earthing point on the recorder.

### The Microphone Transformer

We have said that the crystal microphone is a high impedance device, and the moving coil is low impedance. But, as most readers will know, a transformer has the property of stepping voltages (or impedances) up or down. A step up transformer is invariably used following a moving coil microphone, for example, (see fig. 3), with the ratio of primary and secondary turns calculated to raise the 20 ohms or so impedance of the microphone to perhaps 50,000 ohms to match into the amplifier. (The voltage is stepped up too, from perhaps 0.0001 to 0.005 volts.)

I have shown the transformer as being in the recorder itself. With this arrangement which is perhaps the most satisfactory, the input socket will be labelled "Low Impedance". However, to enable them to be used with recorders which possess only a "High Impedance" input socket, a number of moving coil microphones have been produced which incorporate the transformer inside the microphone or its base. Some models incorporate a switch, marked *High* and *Low*, which puts the built-in transformer in or out of circuit.

By the same token, it must be mentioned that a few crystal microphones include a step-down transformer, so that they may be connected to the low impedance input of a recorder if desired.

### Ribbon Microphones

Ribbon microphones are deservedly popular for recording music, since they are capable of a very high standard of quality. They generally possess special directional properties, too, viz., they do not respond to sounds arriving at the side, and this can often be used to good account. I shall be saying more about this next time.

The electrical characteristics of the ribbon microphone resemble those of the moving coil. The sensitivity is usually lower than that of moving coils or crystals, being perhaps 0.00005 volts/dyne/cm<sup>2</sup>. Finally, the extreme lightness of the ribbon makes it unsuitable for use outdoors, even in the slightest breeze.

### Condenser Microphones

Some types of Grundig tape recorder are unique in being sold with a condenser microphone as an included accessory. Condenser microphones cannot be used with other tape recorders as they stand, because an extra conductor is necessary in the connecting cable carrying a polarising voltage of approximately 100 volts to one of the plates which form the condenser from which this microphone derives its name. In electrical characteristics, the condenser may be bracketed with the crystal microphone. Both are high impedance instruments, and liable to lose signal strength and possibly quality if used on a long lead. In professional circles, condenser microphones are used a great deal, and are constructed with miniaturised pre-amplifiers built into the microphone head, which allow very long cables to be employed. \*Next month: practical hints on using microphones.

# TAPE AND HOME MOVIES

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

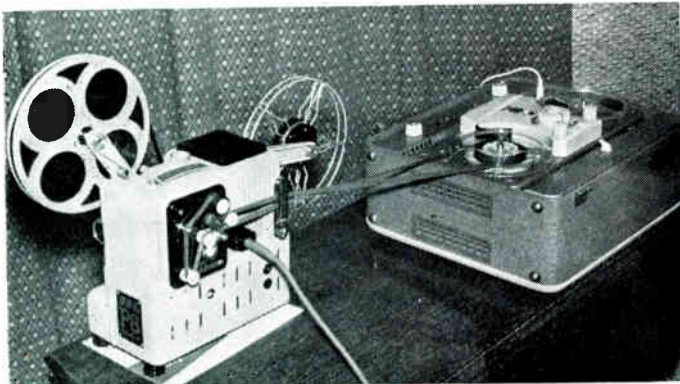
THERE are now a variety of projector synchronising units on the market, and they all make life easier when it comes to coupling a tape recorder to a cine projector. The principle behind the device is simple. The tape is drawn away from the capstan roller on the tape recorder, and passed through several rollers on the synchronising unit. One of the rollers is mounted on a pivoting arm, and the tape forms an additional loop. The projector is switched on but will not start until the tape recorder is switched on. As the size of the loop varies it alters a resistance which is coupled in series to the projector motor. As the tape runs at a constant speed, so it has the effect of keeping the projector at a constant speed. The only disadvantage of the units is that they are not readily interchangeable between different makes of projectors, with the result that each leading manufacturer has his own unit. It is interesting to note also, that all the units are from the Continent.

## The Bolex Synchroniser

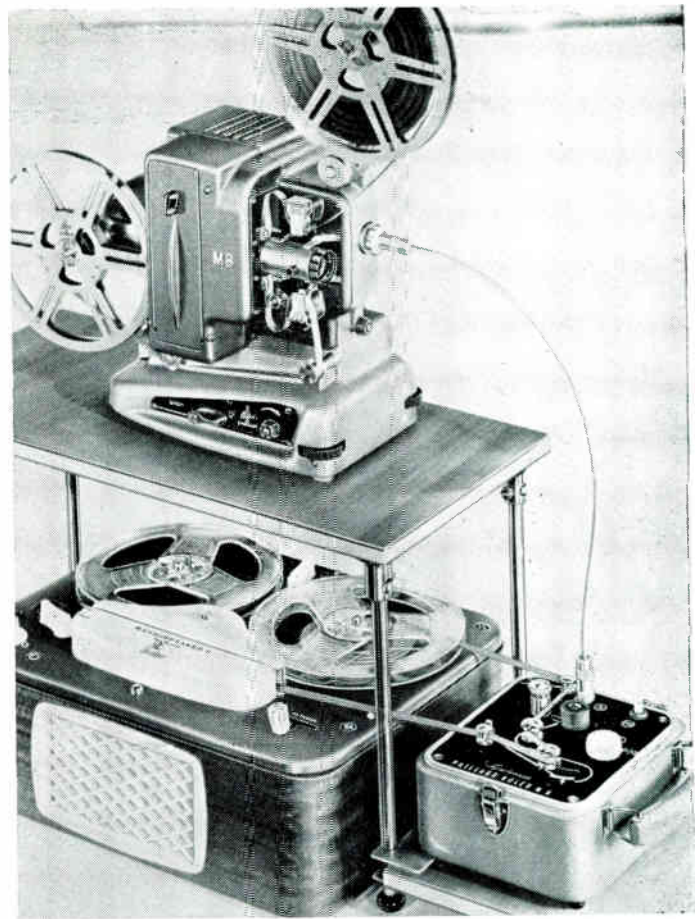
Of the separate units available, the *Bolex* synchroniser is well known, and intended for the *Bolex M8R* projector. It comes complete with a stand for the projector. The tape recorder is intended to stand underneath the projector, and the unit is coupled to the projector by a flexible cable to the inching knob of the machine. The price of £33 10s. includes the modification to the projector, which requires a lead from the sliding resistance coupled to the motor wiring. The tape recorder may be used at either  $3\frac{1}{2}$  in./sec. or  $7\frac{1}{2}$  in./sec., as interchangeable capstans are available for the synchronising unit. The *Noris* synchroniser is a similar unit for coupling to the *Noris* projector. The *Nizo* Synchronario is suitable for the *Nizo* projectors.

## The Bauer System

A rather more interesting development is the *Bauer* "system". More than one continental manufacturer calls his equipment a "system" as they are usually designed to be most comprehensive and complete for the proud owner to make and show films with equipment of one manufacture. *Bauer* are very well known on the Continent, more for their professional theatre projection equipment, but their amateur movie "system" is remarkably comprehensive. With the *Bauer* system, for example, it is possible to couple the *Bauer* cine camera via their synchronising unit to a tape recorder; and when



Showing the simple lacing of the tape through the synchronising unit on the back of the *Eumig Imperial 8 mm* Projector.



A *Bolex M8R 8mm* Projector coupled to a *Tandberg* tape recorder via the *Bolex* synchroniser device. When coupled, the projector is operated by the recorder.

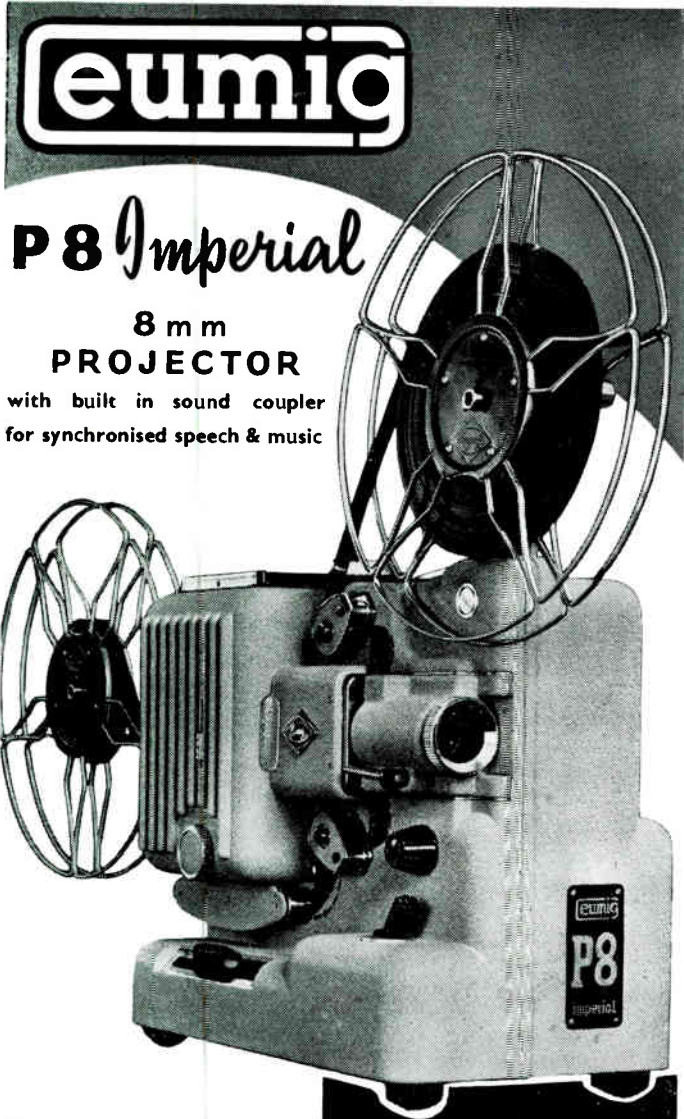
the film is returned from processing, the film may be played on the projector coupled to the tape recorder, with lip-synchronisation as filmed. This highly desirable idea has only one snag—and that is it is only too easy to record the noise of the cine camera; however, with careful placing of the microphone the camera noise can be minimised.

Another complete system comes from *Zeiss*, and it is in three parts. The *Zeiss Movilux* projector can be coupled to a *Zeiss Moviphon* tape recorder, and to complete the range, an extension loudspeaker, known as the *Movivox*, is available with a power amplifier built-in. The system is available in this country, and although expensive, it naturally gives excellent results. For those who already own a *Zeiss Movilux* projector, the extra expense is not too bad.

## Moviphon and Eumig

The *Moviphon* tape recorder is a complete tape recorder, well, almost complete, for it has no drive motor. It is driven from the projector which has an induction motor, via a flexible drive. It will accommodate 5 in. spools of tape, and runs at  $3\frac{1}{2}$  in./second. It will record two half tracks on one tape in one direction, and play one or both mixed together. The advantages of this for cine work are obvious. A commentary can be laid on the top track, and the background music on the bottom track. Both will play back ready mixed. With care, an echo could be laid on the second track. The pre-amplifier is completely transistorised. The tape recorder will not play back on its own. It is intended to be coupled to a radio set for playback. Remember that the average German radio set is fitted with a coupling to record from the radio, and play from the output socket of a tape recorder. Alternatively, the *Movivox* power amplifier and speaker unit would complete the outfit. Just to complete the system there is even a *Zeiss Movimix*—a three-way mixer unit.

Last but not least in this short survey, there is the well known 8mm. *Eumig Imperial* projector. It was preceded by the *Eumig P8* projector, and this machine is still current at £32. Then *Eumig* introduced the



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# P8 Imperial

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PROJECTOR

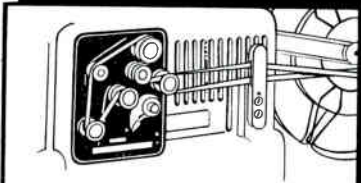
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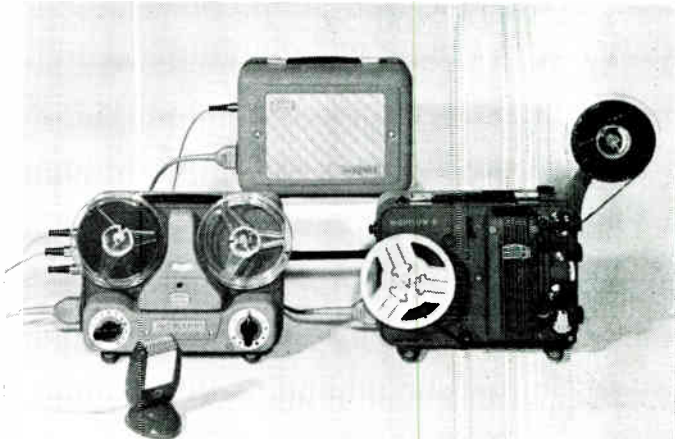
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## HOME MOVIES AND TAPE—(continued)

Phonomat, a tape recorder synchronising unit which fitted to the projector, and cost an extra £18. When the Imperial arrived it promptly made the Phonomat obsolete, and at £37 10s. the Imperial is excellent value for money. It is extremely good value as a projector alone, and it gives a screen illumination from its 12v 100 watt lamp,



The Zeiss 8 mm. Movilux Projector, with Moviphon tape recorder, and Movivox speaker with built in power amplifier.

which is almost unequalled by any other projector on the market. Built in the projector is the synchronising unit (the same one which was originally only available as an accessory) and it is internally coupled to the projector.

When a tape recorder is laced up to the unit and run at  $3\frac{1}{2}$  in./second, the projector is started as the recorder is switched on. The unit is simple to operate, and gives excellent results. To illustrate this article, we took our camera round to Mr. & Mrs. Alan Pearson, who have great fun with their Eumig Imperial and Philips tape recorder. (This tape recorder has a reproduction which would put many a more expensive model to shame!)

**NEXT MONTH.** Recording directly on to the film, using magnetically striped film.

## CAN ANYONE HELP?

● Our postbag includes many requests for information or help of a general nature. We reproduce two of these below.

**From:—W. R. K. James, Birmingham Royal Institution for the Blind, Lickey Grange School, Old Birmingham Road, Bromsgrove, Worcs.**

*Dear Sir:—*I am awaiting the delivery of the catalogue of tape records published by E.M.I. Records Ltd. to ascertain whether there is any suitable material available for use in conjunction with the teaching of blind children.

As a great deal of their education information and entertainment is acquired from audio sources I should be most grateful if, in dealing with various aspects of tape recording, you might be able to suggest any sources of useful material. We are very well off for the general run of recorded music so what I am looking for is of a more general nature such as Wild Life, Native Music, Industrial and Rural Activities—the more unusual and stimulating the better.

I would be most grateful if you could put me in contact with persons who are likely to have some knowledge of these aspects of recording. I should also like to get in touch with some foreign connections with a view to exchanging tapes of various kinds.

*Yours faithfully*

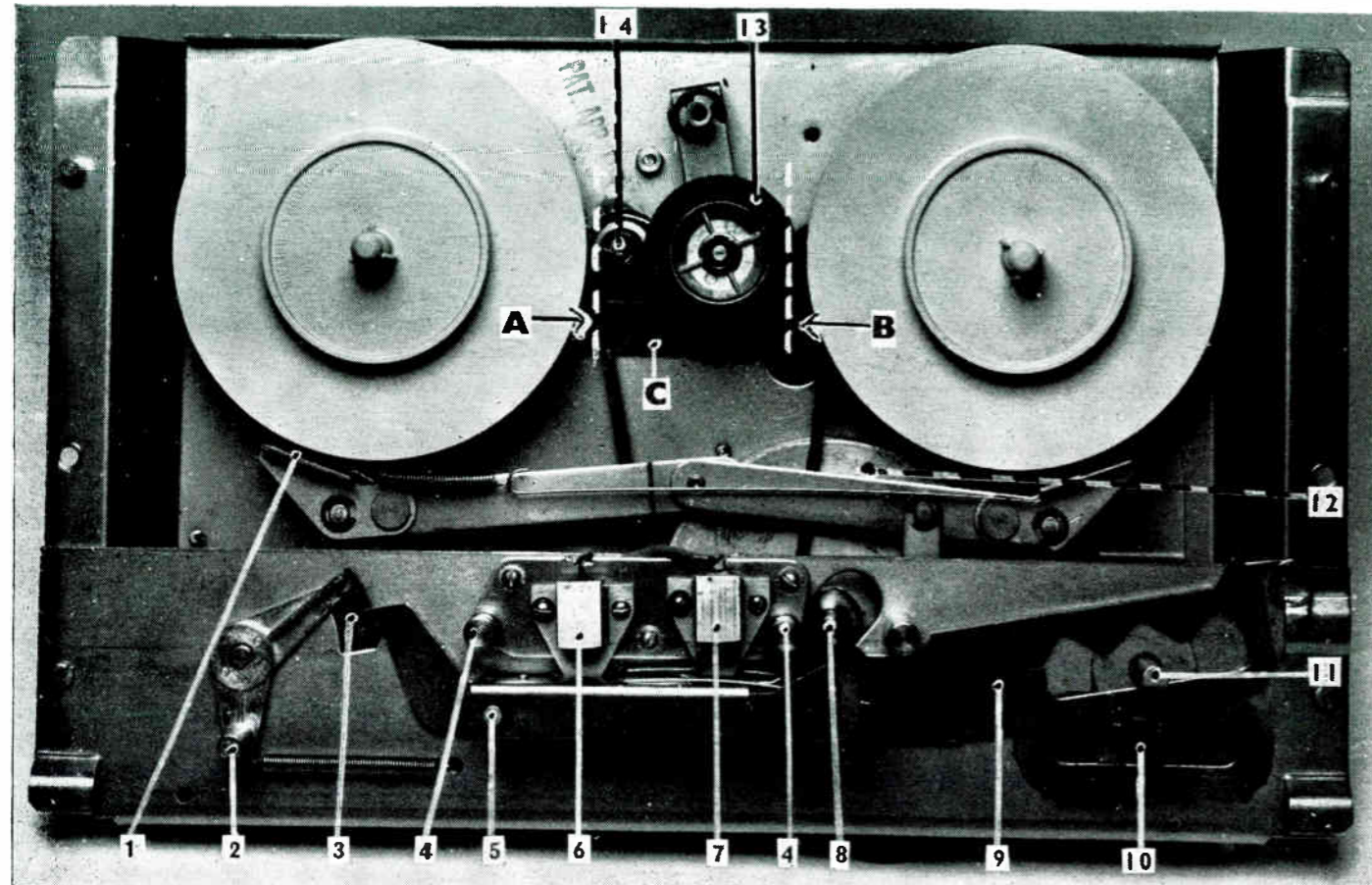
**From:—J. V. Williams, 10 Nab Wood Road, Shipley, Yorks.**

*Dear Sir:—*I have been trying hard to obtain a dubbing of the Hindenburg disaster where the announcer bursts into tears. Can any reader oblige? I have a few interesting recordings I could perhaps send in exchange. Why not start a bureau of dubbing exchanges?

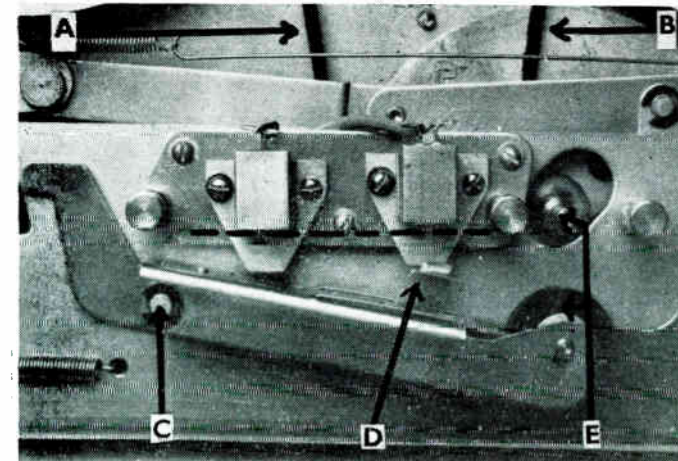
*Yours faithfully*

# THE B.S.R. "MONARDECK"

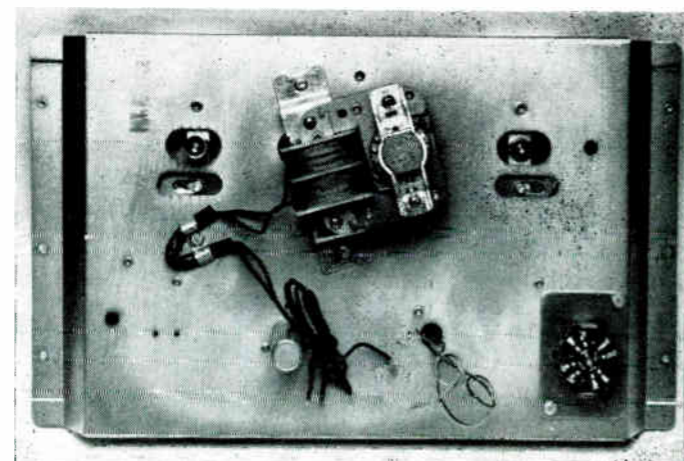
EXTREME SIMPLICITY, MANY NEW IDEAS—AND A VERY LOW PRICE



1. Cork brake shoe. 2. Record/Replay control. 3. Mechanical interlock. 4. Tape Guides. 5. Pivot point for arm. 6. Erase head. 7. Record/Replay Head. 8. Capstan. 9. Arm operating brakes, pinch roller, pressure pad, etc. 10. Zero position of control. 11. Play/Spool control. 12. Capstan flywheel. 13. Idler wheel. 14. Motor drive pulley. A and B show the limits of the spools' movements, by the link C.



A. Belt from motor drive. B. Take-up spool drive belt. C. Pivot (as above). D. Pressure pad. E. Pinch roller and capstan.



The underside of the deck carries the motor, wafer switch (bottom right) and the capstan flywheel bearing.

If only for the reason that it is a definite Harbinger of things to come, the Monardeck is one of the most interesting decks we have yet seen. With very few notable exceptions, tape recorders are built up by their manufacturers around one or other of the currently available decks; and thus, within reason, the ultimate price of the recorder bears some relationship to the cost of this major basic product. It is in this respect that the Monardeck provides a peep into the not-so-distant future, for it will provide recorder manufacturers with the basic product at less than half the price of anything else currently available. And, as a direct result, we shall soon see a range of recorders on the market in an entirely new and low price bracket.

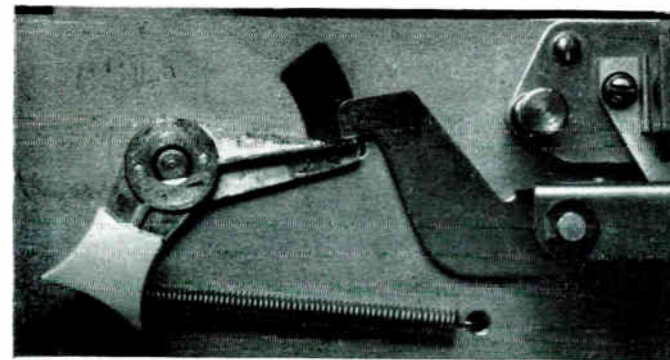
In view of the foregoing remarks, it is only fair to say that this new deck can make no claims to anything approaching hi-fi qualities; and no recorder based upon it can be expected to reach those standards. Let this be well understood now, and not forgotten. But this in no way detracts from the genuine usefulness of the deck which is about to be described. It should indeed provide the groundwork for numerous manufacturers to turn out some really low-priced, simple, efficient and reliable recorders for the rapidly growing domestic market. And, since it is in itself an attractively finished unit, the recorders which are fashioned around it should also look very good.

### Novel Design Features

The Monardeck is so simple in construction that it would appear to be virtually foolproof. It is built on a tray-shaped chassis—a steel pressing which measures  $12\frac{1}{2} \times 7\frac{1}{2}$  inches. On to this chassis are mounted the single motor, the spoolholder mechanism, the idler wheel assembly, the brackets which support the brake arms, and the capstan flywheel bearing. Lengthways, across the front end of the chassis "tray", is another strip of steel pressing which carries the tape controls, the heads, the pinch roller, etc. Over the whole of the "tray" chassis is fitted a pressed steel metal cover, which measures  $9\frac{1}{2} \times 8\frac{1}{2}$  inches, and which represents the overall dimensions of the deck.

### Details of Drive and Controls

Reference to the photo, which shows the cover plate removed, will make the mechanics of this deck extremely simple to follow. On the upper end of the motor spindle is a brass pulley, grooved to take the drive belt for the capstan flywheel, which is similarly grooved. Immediately above the brass pulley is a rubber-tyred step. In the "Play" position of the control, only the belt drive from pulley to capstan flywheel is operative; but a second belt drive (from a small



Here the very simple and foolproof interlock is clearly shown, with spring flyback for "record" position.



The deck, with its two controls, is as neat and as simple as it looks here with cover plate in position.

step immediately above the flywheel) provides the tape take-up drive for the right hand spool.

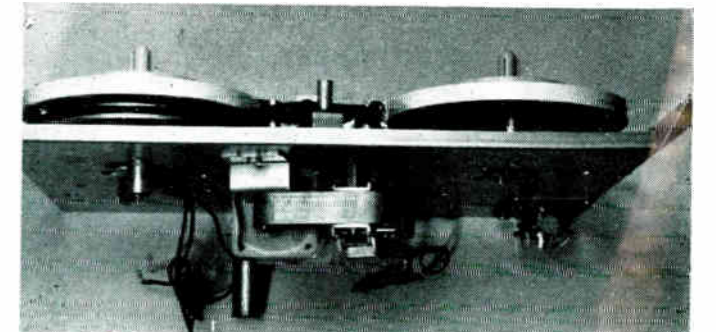
Forward and re-wind spooling are most ingeniously arranged. When the control knob is moved to the right, both spoolholders are moved to the left. This allows the feed spool to run free, but brings the periphery of the take-up spool against the idler wheel, and in turn presses the idler against the rubber tyre on the motor spindle. When the control is moved to the left, for re-wind, both spoolholders are moved to the right, thus pressing the periphery of the feed spool directly against the motor spindle's rubber tyred drive.

The control knob can be moved in three directions. To the left or right, for spooling; and upwards from centre for "play". In order to reach each position, therefore, it must pass "zero", which is at the "T-Junction". And in this position the brakes go on. Here again we meet absolute simplicity. The braking system consists of two pivoted lever arms, linked at the centre, and "push-pulled" by a short metal strip (seen right). Thus, setting the control to "zero" simultaneously applies the brakes and pulls the pressure pad and pinch roller away.

### Mechanical "Record" Safeguard

The control on the left is for "record" and "replay". It is spring-loaded to fly back into the "replay" position, and must be pulled to the left for "record". It is then mechanically locked in this position for as long as the other control knob is forward for "play". This crank arrangement is mounted on the shaft of a wafer switch which can be seen beneath the chassis on another photo; and it provides the wiring point for manufacturers for "record/replay" facilities.

As will be seen, only one pressure pad is used. The erase head is mounted slightly forward from the record/replay head, and the tension of the tape (between the left hand tape guide and the pressure pad) is sufficient to hold it against the erase head. Azimuth adjustment is provided on both heads, by the screws immediately to the left of each. The capstan flywheel is approximately  $3\frac{1}{2}$  inches in diameter and



This view of the deck, taken edgewise on, and tilted, shows the take-up spool belt pulley.

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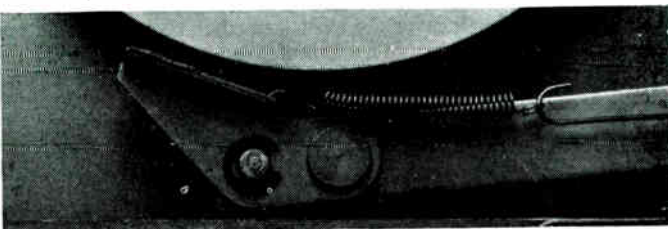
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**THE MONARDECK—(continued)**

½ inch thick. And though this report is in no sense a full review, straightforward running tests certainly showed that it does its job. A recorded tape was played on the deck, and no noticeable wow was apparent on piano music. The makers claim 0.4%, which is welcome for its modesty. The listener's ears thought it must be better than that! On the other hand, the same listener's ears told their owner that they were not hearing anything over about 5,000 c/s from the speakers; and although the output was admittedly plugged into a pre-amp point corrected for 7½ i/s tape speed, this did not look as good as the specification, which says 30 c/s to 8 Kc/s ± 3 dB. However, with suitable correction on the part of the people who design the electronics to go with the deck, this specification figure should certainly be achieved.



The brakes are simplicity itself. The spring and link hold both shoes in position.

B.S.R., the makers of the deck, can certainly be proud of a solid, simple and easily workable job. To say "there's nothing to it", may sound unkind; but it is by no means meant that way. Very considerable thought and planning must have gone into the design, in order to make it look and be so simple. And never forget the truest saying of all about machinery. "The less there is of it, the less there is to go wrong!" Congratulations, B.S.R.!

**Manufacturer's Specification of the "Monardeck" T.D.1.**

**Single Speed:** 3½ in. per second. **Half Track:** Upper track, left to right. **Reel Size:** Up to 5½ in. (5½ in. reel of standard tape=850 feet. 5½ in. reel of Long Play tape=1,200 feet). **Playing Time:** With 5½ in. reel of standard tape 1½ hours. With 5½ in. reel of Long Play tape 2 hrs. 8 mins. **Winding Facilities:** Fast forward wind and fast rewind, giving a rewind time of 3 mins. for 5½ in. reel of standard tape. **Motor:** Wound for 240v 50 c/s A.C. as standard. Other voltages and frequencies to order. **Wow and Flutter:** Total wow and flutter 0.4% R.M.S. **Switching Facilities:** A 4-pole 2-way wafer switch is fitted and this is mechanically interlocked with the tape transport mechanism to avoid accidental erasure of recordings. **Heads:** A high-quality record/playback head and double gap supersonic erase head are fitted. **Frequency Response:** 30 c/s to 8 Kc/s ± 3 dB. With careful attention to the equalisation in the amplifier this can be extended upwards to 10 Kc/s.

**Technical Details of Heads:**

**Record/Playback Heads:** Track width: .105 in. Gap: .0002 in. D.C. resistance: 500 ohms. Inductance: At 1 Kc —2H. At 10 Kc —1H. Impedance: At 1 Kc —12,500 ohms. At 10 Kc —63 kilohms. **Playback Output:** At 1 Kc using .06 milliamps recording current, which is 10 dB below the current need to saturate the tape with 1.4 milliamps bias at 53 Kc/s, 2.5 mV. (These conditions give less than 1% total distortion.) **Screening:** The record/playback head is mu-Metal cased to reduce hum pickup to a minimum. **Erase Head:** Double gap construction is used, giving erasure to 70 dB below saturated tape at 1 Kc. **Operating Frequency:** 50-60 Kc/s. **Operating Voltage:** 20-25 volts. **Inductance:** At 60 Kc/s 0.6 mH.

**APOLOGIES**

We regret that the article on the Challen Minivox has had to be postponed, due to hold-ups in the production of the new recorder.

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by A. Bartlett Still

**No. 1 . . . . AZIMUTH ADJUSTMENT**

WE are living in an age of "Do-it-yourself", an age when all manner of people are tackling all manner of unfamiliar jobs, large and small, and very often with success. Economy is doubtless the original motive, but the unique satisfaction that is derived is worth far more than the monetary saving, although this can be considerable at times. For tape recorder owners the field of maintenance and modification can be wide and ambitious. It will be the aim of this series to stimulate this ambition by giving the informed guidance that should always be sought. We are not going to advise on major re-builds, we want to help you to get the best out of your machine, and keep it that way.

**Write to us about Your Ideas**

We will be looking for your letters, not only suggesting subjects on which you would like hints and advice, but also giving details of your own ideas that have proved successful and that you would like to pass on.

This month's topic is the alignment, or azimuth adjustment, of the Record/Playback Head. On the modern, mass produced, tape recorder the individual testing time has to be cut to the absolute minimum in order to maintain a competitive price, while ensuring, as far as possible, that the published specification is met. This can mean that the head may not be aligned to a standard, but only sufficiently close to it to "pass" on frequency response. Perhaps a diagram will explain this.

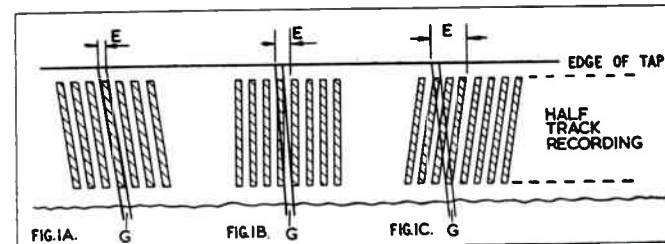


Fig. 1. The most serious result of misalignment of the record/playback head is loss of high frequencies since the effective gap width is increased.

In Fig. 1a a head, of true gap "G", is shown playing a single frequency of its own recording, the highest frequency, i.e. the shortest wavelength, that it will normally be capable of resolving. The effective gap "E" is actually, in this instance, measured along the tape and so is slightly greater than "G". Misalignment will therefore affect the frequency response of the machine on its own recordings to a certain extent, since the greater the effective gap the lower is the top limit frequency.

**The Effects of Misalignment**

In fig. 1b however, we show a "standard" recording of the same frequency, and fig. 1c illustrates a recording made on a machine whose head is tilted by the same amount, but the other way. Due to the misalignment between head and recording, the effective gap "E" must be considered as the length of recording scanned by the gap. In fig. 1c it will be seen that a recording of the frequency shown cannot possibly be resolved, successive "lines" are cancelling each other out. The sketch, of course, is not to scale, and the misalignment shown is excessive for illustration.

Fortunately, checking and correcting the alignment is fairly simple. All that is required is a standard. While test tapes for the purpose can be obtained, a tape record of music in which there is plenty of

"Tinkle", i.e. cymbals etc. is an ideal substitute. In fig. 2 are shown two types of head mounting that allow azimuth variation, with the appropriate screws marked "X". These should be adjusted, while listening carefully to the playback, no more than is necessary to "bring out" the top to its maximum clarity. If you have any doubts as to the correct screws to adjust, look for a spring which is usually under the head to permit small changes in vertical positioning.

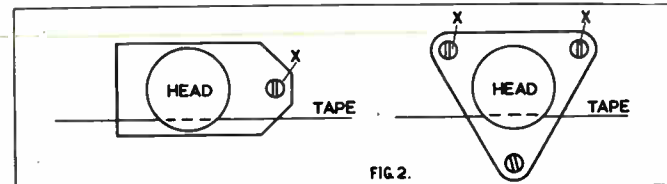


Fig. 2. Two types of head mounting which permit azimuth adjustment are shown here. The bolts X are spring-loaded, and raising and lowering is achieved by small turns with a screwdriver.

Otherwise write to the makers and enquire before disturbing the existing arrangement.

Remember, this adjustment will not alter the recording performance on your machine, and it won't help on playback if the head is already correctly set (as it should be!), but if you had noticed that your best tapes never sounded so good on your friend's machine, or vice versa, head alignment could be the answer.

**NEW "SCOTCH" CARTON DESIGNS**



● All types of 3M "Scotch" brand tapes are to have new boxes of a similar design showing a recording studio scene, and to simplify ordering and recognition each type will have a different colour frontispiece; illustrated hints on splicing are on the inside base.

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By Daphne Oram\*

# HOW TO MAKE THIS "NEW MUSIC"

SO you're all set for a handsome prize! Just think of it. A postman's knock, a weighty box and a glorious day of installing still more Hi Fi tape equipment right there in your home. But whoa . . . just a minute, you know you need all that imagination of yours for creating and building up this tape which happens to be between you and that beautiful day in the autumn. How are you going to set about it?

Quite apart from having those five subjects to choose from, the range and potentialities of this whole field of *Musique Concrète* are just a little bewildering when one is starting out with a new tape and endless enthusiasm. Sound is bombarding us from all sides, all day long. Any of it can be recorded and made into a "sound subject" for your purpose. But you must pick and choose carefully and try to visualize what type of sound is really required as the raw material for your composition in tape music. To do this you need to know all the operations which you can perform on a piece of tape to produce new sounds. They will vary according to what equipment you have available, especially depending on whether you are a competitor in the one tape recorder class or the many machines class.

But let's have a look first at two important processes of manufacture, which we have to become expert at, and give ourselves a preliminary exercise or two.

## Make Yourself Expert at Splicing

A good knowledge of editing is essential in both Class A and B. Study I. W. Jarman's articles in the first three numbers of "*The Tape Recorder*". Put in as much practice as possible on splicing *before* you come to cutting your precious tape of *Concrète* sound subjects. If you have no editing block you could use postcard and paper clips as shown in the diagram. Practise editing music and sound effects as well as speech. Why not try editing alternate notes out of a chirruping bird call—it will keep you amused for hours besides helping your technique! No birds handy? Then try a dripping tap. It is necessary to become really accurate at this job, because some of the most interesting sounds can be obtained in this way—for example by cutting off the percussive attack from the front of a bell or piano note.

## Finding The Place

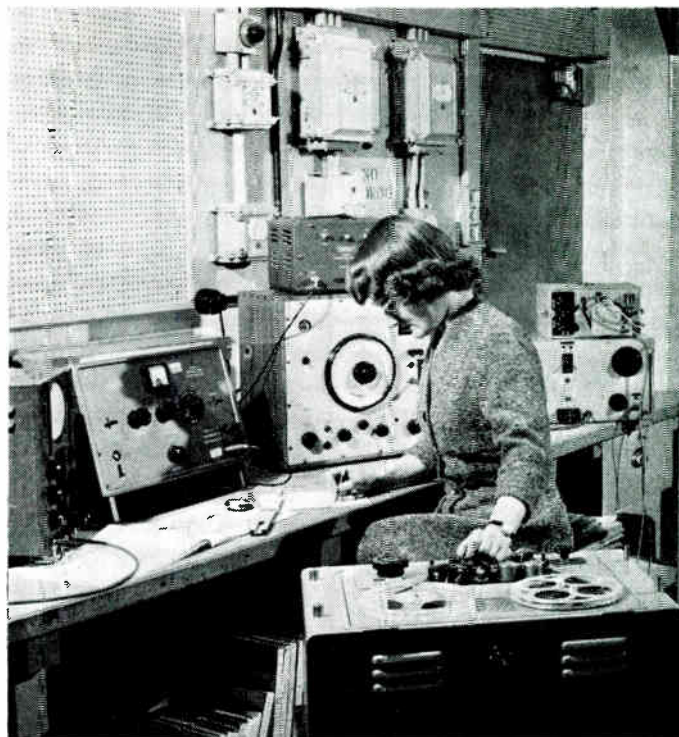
One of the greatest difficulties is to locate the exact position on the tape of the sound you wish to cut out and keep. The rev. indicator will give you an approximate idea. A small piece of jointing tape inserted perpendicularly at the exact spot where the tape winds on to the take up spool will enable you to go back to the same place quickly.

Play from this spot (which you know to be a little prior to your goal) counting the musical beats or sounds until you reach the wanted subject. Go back to the perpendicular tape setting and count again, this time stopping the machine just *before* the wanted sound. Mark the tape with soft yellow wax pencil at the playback head. If you can monitor whilst turning the tape past by hand, have the volume level high and check by ear that the pencil mark is just a fraction before the required sound. Mark the end of the modulation by this method too or by going back to the perpendicular tape and recounting. This time include the wanted sound in the count.

## What to do with the wanted sounds

Keep a spare spool handy marked "master" on which you can put this wanted material. It's worth it. The wind always blows if you lay the lengths out on a table! Short inserts of coloured leader between the sounds will help to identify them if you are leaving the sorting until later on. Put a wax pencil mark on each subject to show the suggested playback speed.

\*Daphne Oram has kindly consented to be one of the panel of judges of our "New Music" Competition.



In a previous "incarnation" the author operated the B.B.C. Radiophonic Workshop. She is seen here composing a piece of *New Music* from electronic oscillators, and has now set up her own studio in Kent for electronic composition and *Musique Concrète* under the name "Oramics".

If you have only *one* half track machine you will not usually be able to indulge in "backwards sounds". But should you have a full track machine you will be able to put these sounds straight on to the master tape in the backwards direction. When working with *several* half track machines it is preferable at this stage to keep these sounds to be played backwards on a separate spool—a heavy metal spool is best, for reasons we come to in a moment.

## Manipulations of Sound Subjects—1. Backwards

(Not usually possible for Class A, unless, as already said it is a full track machine.)

Class B—with two machines. Spool tape on to the right hand spool. Place left hand spool on turntable of gramophone. (Heavy spool will grip the best.) Hold back pressure pads a little, if they are tending to prevent the turntable from driving the tape properly. Half engaging the playback condition will very often allow the right hand spool to revolve freely without the motor starting (i.e. removes the brakes) and will at the same time operate the playback head and amplifier. Of course the tape speed using this system does not depend only on the gramophone turntable revolutions, but also on the amount of tape already wound on to the take up spool! However this enables you to get faster speeds, by using a well-filled spool when required. The "backward" sounds are recorded on your second machine.

Class B—with three machines. Place the two machines close together (as shown in diagram). Thread tape from right hand spool of right hand machine past playback head and then over to second machine past its capstan only and so on to its right hand spool. Half engage playback condition on right hand machine and fully engage drive on left hand machine. Record on third machine.

With a stereo machine, you simply spool tape on to right hand spool, change over position of spools and record from other track.

## 2. Filtering

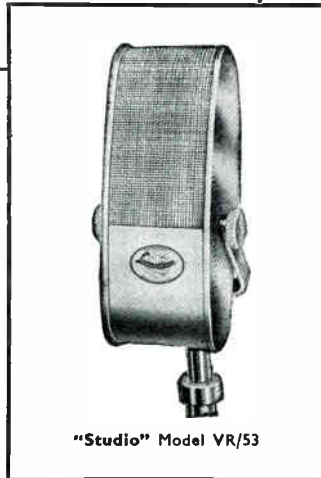
Many readers will possess some form of tone controls, or a high fidelity control unit. These are excellent for making small changes in quality. But in this field we often want more drastic filtering, which may call for a bit of "fiddling".

If a muffled sound is required, try filtering out the top frequencies by playing the tape through the wrong side (shiny surface to playback head). But remember, with half track machines this means playing it backwards, so use the techniques given in the previous paragraphs to

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## HOW TO MAKE THIS "NEW MUSIC"—(continued)

get it the right way round again. A 0.1 µF condenser used in series will cut the bass or you can experiment with other values. Use a condenser in parallel to filter out the top frequencies.

Class A competitors will have to introduce any filtering in the input circuit to the recorder. But another approach is to try different microphone positions—inside a cardboard wastepaper basket or a metal box, at the other end of a resonant passage or hemmed in by rugs.

### 3. Varying the Speed

Innumerable new effects can be obtained by means of changing speed. The hand lightly applied to the fly wheel of the drive capstan will give you a glissando but do be CAREFUL about ELECTRIC SHOCKS when inserting the hand into the machine. The capstan itself can be increased in size by winding sellotape round it but this usually produces wow. Instead try running the right hand spool on a gramophone turntable as described in "backwards technique". Most old 78 turntables have variable speed controls, and you will be able to tune your sounds to almost any desired pitch.

### 4. Making Tape Loops

Cut out two interesting rhythmic patterns. Make each one into a loop so that the rhythmic pattern never stops. Play both loops at once and record on third machine until all the permutations have occurred. Very complex and intriguing rhythms can be obtained this way. Size of loops can vary. Lace the long ones round a music stand or standard lamp but not round the best vase—if the tape catches suddenly it can exert quite enough pull to remove ornaments off the mantelpiece.

### 5. Superimposing

Record the first sound at high level. Then lace up the same piece of tape so that it does not pass the erase head (or else put a piece of card between the erase head and the tape). Now record the second sound over the first. You will find that the dynamic level of the first one will have been somewhat reduced (due to the bias introducing partial erasure) so that you may have to experiment with levels if you require both sounds to be equal.

### 6. Mixing

A mixer such as John Berridge described in the May "Tape Recorder" is a great help. I might go so far as to say that mixing is a whole art in itself, and after a bit of practice you will be able to fade in and out individual sounds so as to build up a highly professional montage. If you have no mixer, you can make up a jack strip all in parallel (very convenient ex G.P.O. jack strips with twenty jack sockets can sometimes be picked up for a few shillings). For a difficult mix

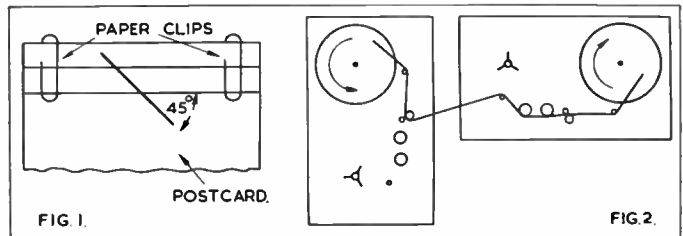


Fig. 1 An improvised editing block. Fig. 2 Running Backwards. it is often easiest to make each sound into a loop with just a short piece of leader tape between beginning and end. You can then try the mix over and over again without any spooling backwards to locate the start.

I find that I am using all of the above techniques and ideas continually in my work, and I am not above using them *all at once*, if necessary, or trying out new ideas on the spur of the moment. So my best advice is do try all these techniques before you embark on choosing the raw material for your competition entry. Do not record a sound just because it interests you as it stands—that's just a straight forward sound effect. Try to imagine the sound as it will be *after* you have played around with it. First, built up in your imagination the complete composition of sounds that you require. Then sally forth to find material which, when you've manipulated it by the techniques outlined here, will give you those exciting new sounds which your imagination has already enabled your inner ear to hear.

Oh, yes, that postman's knock and that weighty parcel may not be so far off after all!



## YOUR LOCAL CLUB? (5)

### The Coventry Tape Recording Club

THE Coventry Tape Recording Club was formed on 20th February, 1958. The inaugural meeting attracted 13 prospective members, and Mr. Malcolm Simmons was elected Chairman, Mr. Roy Penfold, Secretary. Like all new ventures, it was difficult to get things moving and with true English reserve, members who in the majority were strangers to one another, kept their thoughts and ideas to themselves. However, thanks to the Committee, progress was gradually made and contributions for club meetings began to come forward. After about two months existence the Club was fortunate enough to have as a member Mr. Leslie Skingley, Editor of the G.E.C. (Coventry) magazine, who was practised in the art of interviewing. At the same time, permission was given by the Manager of the Coventry Theatre for the Club to approach celebrities performing in the City, with a view to interviewing them. The first celebrity to be interviewed was Miss Beryl Reid whose contribution to the Club Library is one of the most treasured items. Other artists included Bernard Miles, Michael Holliday, John Slater and Bobby Howes.

Some of the visitors to the Club during the first year of its existence made a varied list of personalities, ranging from a young English lady, now married and living in America, who gave members an insight into a young wife's life across the Atlantic, followed by the Chairman and Secretary of the Coventry City Football Supporters Club, who told members how they function and their progress in relaying requests and football commentaries to the patients of the local hospitals.

Later visitors included a free-lance journalist working for the Canadian Broadcasting Corporation. They also had a visit by Mr. Harley, winner of the British Contest 1958, who took along his winning tape and explained to members how he compiled it, and told of his visit to Switzerland later in the year for the International Competitions. There were several demonstrations during the year, including a stereo demonstration by a local firm, ciné-film coupling with sound track on tape from the Birmingham Ciné Club.

Members visited the local branch of the International Friendship League, the International Club, etc., and entertained these people through the medium of the recording machine. They also visited the B.B.C. Sound Studios, B.B.C. Television Studios—both at Birmingham, and the Coventry Telephone Exchange.

Due to a steady increase in the Club membership, now 31, future meetings will be held at the Post Office Social Club. Arrangements are in hand for visits to the MSS Studios in London, the A.T.V. Studio in Birmingham, and for a demonstration of amplifiers.

The first inaugural meeting of the Federation of Tape Clubs was held in Coventry, thanks to Mr. Roy Penfold, who is now Secretary of the Federation, and Mr. Malcolm Simmons who is their Treasurer.

### CLUB ROUNDABOUT

● **Birmingham Tape Recording Club.** Their membership is growing steadily. Anyone physically handicapped is made an Hon. Member. They have recently had demonstrations of the Brenell Mark 5, Simon SP4 the new Elecktron, and the Walter tape recorders.

The Secretary, Mr. Dennis Osborne, 75 Millmead Road, Bartley Green, Birmingham, 32, requests that all new or prospective members should contact him. The Club is soon to have its own magazine.

● **The British Tape Recording Society** has now been granted Honorary Membership of the Toronto Tape Recordists Association (address: 211 Roxton Road, Ontario, Canada. Secretary V. Wilson), and they will exchange data.

● **A new Club "The Brighton Ambulance Service Tape Recording Club"** has applied for membership to the B.T.R.S., and also asks for tapes from other Clubs. Their Secretary, Mr. Edward Giles, requests help in getting started. His address is: 83 Ditchling Road, Brighton, Sussex.

● **Catford.** Since the last edition of this magazine the Catford Tape Recording Club have held two meetings, and two demonstrations of tape recorders, one a Truvox and the other a TK35. Ron Parsons loaned a tape explaining World Tape Pals. The club is organising a stand at the Hobbies and Handicrafts Exhibition on Saturday, 16th May. This Exhibition will last until the 23rd May, 1959, and they hope to have a recorder on their stand, during the evening, to record visitors' voices for immediate playback.

● **Catholic Tape Recorders** have gained many new members in the past few weeks, including seven members who purchased tape recorders

## TAPE CLUBS

### Notes and News



★ Members of the Kettering club during a recent demonstration of M.S.S. equipment. On the extreme left is G. E. Spark M.S.S. sales manager.

after joining. In Harrogate they are building up a library of recorded tapes by specialists in various subjects, and hope to receive more from the library in the States.

● **Coventry.** Their last meeting was held on April 30th at 7.45 p.m. in Rotherhams Social Club, and a varied programme was included. Mr. Arthur Rowe, one of their founder members, is leaving for the U.S.A. this month, and has promised to tape to the Club when he has settled down in the States. They look forward to hearing from him, and wish him the best of good wishes for his new life.

● **Edinburgh Tape Recording Club** held two meetings in April, one on the 14th and the other on the 26th. At the first meeting the General Programme Producer for the B.B.C. talked about his programme "Scope". One of their committee members was able to lend him a recording of a local barrel organ. At the second meeting they played a tape from Bob Newman, President of the Chesterfield Tape Club, entitled "Around the world with a tape recorder". This proved of great interest, particularly as one of their own members was featured giving a recipe for porridge. Future meetings will be held, as from the beginning of June, in the Edinburgh Ciné Society rooms.

● **Grantham.** The Grantham Tape Recording Club will hold their inaugural meeting in the Grantham Guildhall at 7.30 p.m. on Tuesday, May 26th. For further information please write to the Secretary, Mr. R. V. Huddleston, Messrs. G. & G. Cope & Co., 33 London Road, Grantham.

● **Irish Tape Pals.** The Irish Tape Pals have 100 members in various countries. Their particular aim is for more people there to have tape-pals abroad and vice-versa. Although most of the members are content to exchange tapes they have held two rallies in recent months. At the first of these some films received from American members were shown, and on the second occasion a group tape was made in Crusie's Hotel, addressed to all their members in South Africa, Australia and New Zealand. All present sent messages out, and Irish music and song was in plentiful supply. They intend to send similar tapes to their tape-pals in the U.S.A., Canada and England. For full de'ails please contact Mr. E. T. O'Neill, "Mandalay", 12 Mayorstone Park, Limerick.

● **Kettering.** At their meeting on the 29th April, held at "The Rising Sun", Kettering, it was decided that the Club should produce a tape feature called "Our Town". The main event of the evening was presented by member Mr. P. Penn, who demonstrated the various uses that he puts his recorder to, who included excerpts from the lectures he has recorded, also a talk given by a recent visitor to the town on the subject of "Flying Saucers".

● **Leeds and District.** The main object of the meeting held on the 23rd April was to form a Committee. They now have 17 members. Three members demonstrated their recorders, and Mr. Williams demonstrated his Geloso with a 6 minute recording entitled "A Bedtime Story".

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## TAPE CLUB ROUNDABOUT—(continued)

● Merthyr Tydfil held their inaugural meeting on Wednesday, 25th March, 1959. They plan to develop a Hospital Service, also a Blind Service, as part of their outside activities. The group, which started with fifteen members, intend to meet once a fortnight. As they are the first and only Tape Recording Society so far established in Wales, they hope that other Welsh tape enthusiasts will contact them and help to remedy this. They would also welcome contacts from other Clubs in Britain. Particulars from Mr. C. Francis-Griffiths, 4 Garden City, Penydarren, Merthyr Tydfil.

● Rugby. At their Club meeting on Thursday, 23rd April, four members presented their own tape programmes. During the next few weeks they hope to visit all the nearby clubs officially.

At the next meeting, to be held on the 14th May, they expect to have a practical demonstration by the makers of Scotch tape and by Walters Instruments Ltd. The following meeting will be the A.G.M. All are invited. Mike Brown, 219 Clifton Road, Rugby, the Secretary, will welcome correspondence from other Clubs on matters of mutual interest.

● Sheffield. The meeting held on the 22nd April was confined to the showing of colour film slides with tape commentary by Mr. Brazil. Their last meeting was held on the 6th May, at the Y.W.C.A., Division Street, at 7.30 p.m., and the Agenda was: Society Meetings, Tape Time, and Question Time. For details of future meetings, etc., write to Mr. F. Shepherd, 4 Birchitt View, Dronfield.

● The South African Recording Club. We have received a letter from Mr. John de Villiers, 37 Burnside Road, Tamboershoof, Cape Town, South Africa, stating that they staged and recorded a play at their April meeting (7th April), as each member entered, a script was thrust into their hands and later members were chosen for the cast. First they had a fast run-through, then the real recording with sound effects, etc. This was a great success on replay, and copies are now available to members.

● The Tape Recording Society of Great Britain has now enrolled its first member from overseas—S/Sgt. F. C. Williams of the Signal Sqdn., at Malta. Commencing June, they will be receiving regular news bulletins from the U.S.A. Nominations for the new Committee, due in June, are being invited. They would also be pleased to hear from any overseas readers who could send them regular reports both technical and non-technical, on tape. For further details please write to the Secretary, Mr. John R. Walters, 29 Pitt Street, Broadwaters, Kidderminster, Worcs.

● The Voicеспondence Club (Sightless Members Section). This Club has now built up a good Tape Library. They acknowledge the help of Messrs. Gevaert Ltd., The Minnesota Mining and Mfg. Co. Ltd., The M.S.S. Recording Co. Ltd., Messrs. Wallace Heaton Ltd., who have all so kindly contributed reels and tape as gifts to the Library. The Library is run in conjunction with Readers who contribute interesting items, and there are now sufficient reels available for circulation to members. For full details contact Mr. John Le Hughes, V/S Club Service Committee, 10 Lillie Road, Fulham, S.W.6.

● Walthamstow & District Tape Recording Society. Sixteen people attended the inaugural meeting held in Walthamstow on Friday, 24th April, Secretary J. A. Wells, 178 Selwyn Avenue, Highams Park, London, E.4. Meetings are to be held on the first Friday in the month. They hope to hold these meetings at the headquarters of the Liberal Association, but this will be confirmed. For details contact the Secretary, address as above.

● Ipswich. Mr. M. Wilding, Vice-Chairman of the I.G.C., The Ipswich Gramophone Circle, 31 Darwin Road, Ipswich, will be very pleased to hear from persons living in or near Ipswich who are interested in starting (or joining) a Tape Club. Any information concerning tape recordings will be most welcome.

● Colchester. Anyone interested in joining a Tape Recording Club in Colchester please contact Mr. S. J. Yeman, 1 De Vere Road, Lexden, Colchester, Essex.

● Ramsgate. Anyone interested in forming a Tape Club, please write to Mr. E. A. Moody, 33 Hawes Avenue, Nethercourt, Ramsgate. His interests are Tape, Ciné & Still Photography.

### Information

The following have written to us for information on their nearest Tape Clubs: Mr. S. V. Jenner, 58 Westbourne Road, London, N.7 (Islington). Mr. K. H. Odey, 217 Cricklade Road, Swindon, Wilts. (Swindon). Mr. W. Russell Dyson, 4 Horrington Road, Aighurth, Liverpool, 19 (Liverpool).

By Maurice Brown

# The Art of Tape Editing

## (3) Cutting the Script

IN my first two articles on tape editing I concentrated on what I term editing in the mind—recording what you want and how you want it—to make the actual physical editing, the cutting and splicing, more easy and more technically efficient. We have now arrived at the point where we have our recorded tapes and we know, or should know, what is on them. The prudent recorder has not only marked his tape boxes with much care, kept a note-book of detailed contents—"good bit on condition of dog's front paw" about thirty seconds in on *tape 2*; "joke about Ma-in-law" a quarter of an inch from end of *tape 6*—but he has too, I trust, developed that long range memory which is so important. In fact he knows his way about his tapes and now he has to make up his mind how he is going to use them.

As far as the spoken word is concerned, I am convinced that far the easiest and best way to do your preliminary work is on paper; it makes all the difference if you can read what your recorded speakers say as well as hear them. So, get down to it, or preferably get a willing wife or girl-friend to get down to it for you, and copy down all the words on the tapes. If it is typed, double-space it, so that there is room to put in your editing notes. Then start cutting and re-ordering on paper.

There are other methods of course. We have all played back our tapes and stuck in little bits of paper to mark the passages we want.

to Finney (phon.) - Finney is a great sufferer from it - Matthews to a certain extent but Matthews has got such a reputation now that I mean - ... Well, we must leave Finney alone. He's an old man. Let him pull the crowd in a bit. That's what I think anyway. But, the referee, should, in my estimation, at least put the ... the defendants have in the book ... send him off for it. He doesn't. But he should do. As for the crowd and the players' behavior is concerned, if you see a professional player or brilliant player constantly obstructed you're entitled to get annoyed. I know I get annoyed in my job, if I can't seem to get - seem to get battled in all directions and I can't do anything about it. I get livid. I go round the corner and have a talk to myself and calm myself down but - on the football field you can't do that.

The advantages of having a transcript on which to edit are obvious from these two examples. Simple transposition of two words (shown above) and more complicated changing round of the order (shown in the picture at the foot of the previous column).

We have watched them fly out as the tape is run back, put them in again, cut out one piece of tape, wound again, out came the markers, in they went again, until ultimately they were feet, or seconds, away from the passage they should be marking.

There is, too, the timing method when you play through the tape against a stop-watch and note down the times at the beginning and end of the extracts required. This is fine until you start cutting, for you very likely forget to time the pieces of tape you remove and subtract the result, when necessary, from the timing of the beginning of your next extract, and your system falls about your ears.

To my mind the best and simplest way of marking up tapes is to use a yellow pencil which is soft and sticky. Sharpened like a chisel you can mark the back of the tape with the flat edge of the pencil with a good solid yellow mark about a foot long, which is quite noticeable when running a tape fast. Write the number of the extract next to the long mark and all you have to do is note down which number you have removed while editing. It's a lot quicker than doing sums with stop-watch readings.

But, I believe all these methods are vastly inferior to editing off the written page, and ultimately they take much longer. They have, too, another major disadvantage—it is very easy to miss some highly important phrase, perhaps only seconds long, about which you have forgotten. In typescript it stares up at you and demands to be used. And there, I think, is the secret of success; get to know those words, even if there are one hundred thousand of them, so well that you can build up a paragraph from extracts taken from many different pages of your transcript.

Let me give an example of the point I have just made. For the four Gandhi programmes about which I wrote last month the words which were typed for us by several patient and hard-working girls amounted to just less than a quarter of a million. Yet through knowledge of them it was not difficult to build up a paragraph from them such as this:—

"We owe a great deal to him. As I said, this move, this revolution in political ideas would never have taken place so rapidly if Gandhi had not been on the spot. I think we gained our freedom very cheap. Other countries have shed their blood over it. We didn't shed any blood at all. He may have made mistakes. I thought his politics were too emotional. The one bad thing which he produced is a sense of hero-worship, which in my view has no place in politics at all."

The transcript of Dr. M. R. Jayakar's recorded words consisted of eighteen pages and the extract I have quoted was edited from three pages, and ultimately copied on to another tape, like this—the first two sentences from page 14; the next three from page 13; "He may have made mistakes," from the top of page 15; "I thought his politics were too emotional," from page 18; the last sentence at the bottom of page 15.

I think this sort of treatment should be common-place. It is not good enough only to use short or large chunks from your tapes without cutting in other material if you can make your point more strongly by intelligent juxtaposing. Throw your words about; join with this that;

I'm not I. C. C. (1) (2)  
 II. C. C. C. C. C. C. (1) (2)  
 Well, I travel quite a bit. I'm getting a little bit older now and not quite so much as I used to, but I still travel quite a bit. And you have a lot of fun on the trips. You find odd restaurants and go to food, and food, nice people, bad people. And you went over to Sweden, during the summer, in it (phon.)  
 Well, the Sweden trip was my idea. .... a jolly good idea too. Now for we want was a question of ... I was originally going with a friend of mine and he backed out so I thought to myself .. I'm determined to go. And the question of vehicles to go in, that was the first thing - or how to go - that was the first thing and I thought, well, Sweden is a fair way but I'd like to go by road. I enjoy driving - although driving is my job. I enjoy driving - I don't enjoy driving particularly in the West End of London at the present time - too many cabs driving beside you, but I like driving and I had a fairly new cab - the best reliable vehicle - as the Assistant to the Commissioner of Police is constantly telling me - and I decided to go. That's what I thought that ... well, I'd planned and allowed for the cost of a car hire. I couldn't get my car to go with me. I'm going up in an aircraft circle of friends because it seems a little funny and I think in the end surviving

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Fi-Cord .....	6 4 0	4 12 11	59
Philips AG8108 .....	6 11 0	4 17 7	62
Sound 553 .....	6 17 0	5 2 4	65
Grundig TK25 .....	7 3 0	5 7 1	68
Stuzzi Magnette .....	7 5 0	5 8 8	69
Brenell Mark V .....	7 5 0	5 8 8	69
Essex .....	7 18 0	5 18 1	75
Grundig TK30 .....	8 4 0	6 2 10	78
Telefunken KL85 .....	8 8 0	6 6 0	80
Harting HMS .....	9 3 0	6 17 0	87
Grundig TK35 .....	9 5 0	6 18 7	88
Simon SP/4 .....	10 10 0	7 17 6	100
Reflectograph 500 .....	10 18 0	8 3 10	104
Tandberg 4-Track Stereo .....	13 4 0	10 3 9	129

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enjoy yourselves. Do it first on paper and then get down to the actual editing of the tapes.

Do not be afraid to change the complete sense of a sentence if the change still honestly represents what your speaker meant to say. The first illustration in this article shows what I mean.

This is a photograph of part of a page of the transcript of a recording made by an enthusiastic football supporter who is also a taxi-driver. He got, if he'll forgive me for saying so, a little muddled. But, as I hope you can see, it was not difficult, by *cutting* in two words, and *cutting out* a few more, to put back the sense he wanted. It originally read like this:—"If you see your favourite player or a brilliant player constantly obstructed you're entitled to get annoyed. I know I get annoyed in my job, if I can't seem to get—seem to get baulked in all directions and I can't do anything about it. I get livid, etc."

By adding the two words "is" and "he's" from previous sentences and by cutting, it finally read as follows:—"If a brilliantly player *is* constantly obstructed *he's* entitled to get annoyed. I know I get annoyed in my job, if I seem to get baulked in all directions. I get livid, etc." And this was the sense both the speaker and I wanted.

#### Copying is Better Than Splicing

The second photograph, which is of another page from the same transcription, shows two other examples or parts of example of transposition or re-ordering. The first, numbered 1, 2, 3, is simply a matter of condensation and sense-making. It is too long to copy out here so I hope you can read it in the photograph. The process was simply this. Start at the first bracket, cut the second word and run for five words. Jump ten lines and use the nine words between brackets and come back to the end of the first extract, cut words 8-15, and finish the paragraph. Twelve lines of transcript therefore are cut to the following:—"I travel quite a bit./I enjoy driving although cab-driving is my job./I'm getting a little bit older now but I still travel quite a bit and you have a lot of fun on the trips. You find odd restaurants and good food, bad food, nice people, bad people." This was all on page 14; the insert as it was ultimately used was continued on page 4.

The next extract, lettered a, b, c, d, e, f, is rather more complicated. Again it is a matter of condensation and sense but in the middle—c d e f—I drastically reshaped the order of words to make the passage run more easily. It went like this:—"I couldn't get anybody to go with me. None among my immediate circle of friends." By cutting the "none" and re-ordering the words the result we finally arrived at was this:—"I couldn't get anyone/among my immediate friends/to go with me." I hope you agree with me that small changes in detail such as this are worth the trouble; they are also the fun.

I could go on giving examples of these kinds, but, I think the three about which I have written give enough idea of how I think tape recordings can be used. My major belief is that we all should make the most of what we have recorded; by taking a lot of trouble. It is worth it. And again I stress the importance of having a transcript; it would be most difficult, as I am sure you agree, to do this kind of editing without it. When it comes to cutting speaker into speaker, sentence against sentence, disagreement, argument, I suggest it is impossible to edit efficiently without the words before your eyes.

#### A More Complicated Example

So much for paper work; the thought before the action. How about the actual physical editing; the razor blade and the splice? Before we get to that latter stage I have one further suggestion to make. If it is possible, and it means two recorders, copy the extracts, on to another tape; short—single words if need be; or long—a paragraph or a whole page. Copy them in order and then edit the copy.

There are several advantages. Firstly, you retain your original tape uncut so that if you wish to change your first ideas you still have all your material available and do not have to try and find a sentence or a word in the ever-increasing pile of discarded tape on the floor. Secondly, if you have the equipment, you can, to some extent, correct quality; reduce hum or lessen the boxed effect of a boomy acoustic; by a little cheating convey more bass or take the edge from excessive sibilance. Thirdly, you can adjust your levels, not only between tape and tape but, and it is frequently necessary, when putting together fairly complicated passages such as I have given as examples above.

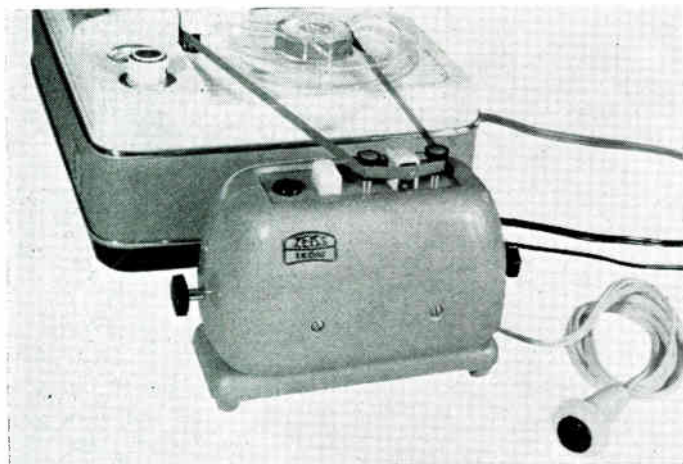
The production of a tape or tapes containing your roughly edited extracts in the right running order is a matter of routine. The more detailed and personal editing which follows demands more judgment and real artistry. It will be the subject of my final article next month.

# TAPE, RECORDERS & ACCESSORIES

## FIRST DETAILS OF NEW PRODUCTS

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

The Zeiss Ikon Diatrakt



THE Zeiss Ikon Diatrakt is a device for coupling an automatic transparency projector to a tape recorder.

It is suitable for all tape speeds down to  $1\frac{1}{2}$  i/s. Transistors are employed and it can be used at all voltages from 110 to 240 A.C. In use the slides are run through adding the music or commentary and changing the slides at the required moment, by pressing the remote control button this automatically adds an inaudible control signal to the tape. On subsequent runs the slides are automatically changed at these points. The price is £21.

It will be available through Peeling & Komlosy, 181 Dunstable Street, Dunstable, Beds. in July.

Output 2 watts. The size is  $15\frac{1}{2} \times 15\frac{1}{2} \times 8\frac{1}{2}$  ins, and the weight approx. 36 lb.

The finish is cerise and Windsor beige leathercloth with polished gilt fittings. One has been submitted for review.

Further details of this and other Spectone products can be obtained from Specto Ltd., Vale Road, Windsor, Berks.

★  
The Universal  
Sound Mixer  
Manufactured  
by Technical  
Suppliers Ltd.



FOR tape recorders without mixing facilities, a small inexpensive mixer unit is a very useful accessory.

For only £2 2s. the T.S.L. Universal Sound Mixer should prove a popular product. It has provision for three high impedance inputs, all connections are by standard jack sockets. The level from each input is controlled by a logarithmic potentiometer. The size is  $4\frac{1}{2} \times 3\frac{1}{2} \times 4\frac{1}{2}$  in. and the weight 1 lb. 6 oz.

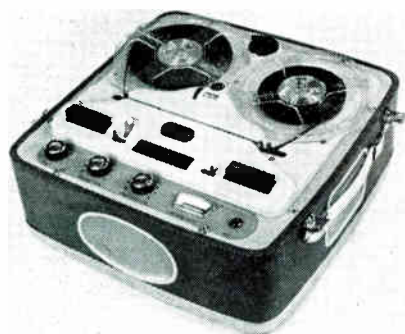
Manufactured by Technical Suppliers Ltd., Hudson House, 63 Goldhawk Road, London, W.12.

The Metro-Sound Klenzatape

METRO-SOUND, who have for some time produced accessories for Record Players, including the range of Masterpoint Stylis, are now entering the field of Tape Recorder Accessories.

The first of these Accessories is an entirely new device in kit form called Klenzatape. This product comprises a brush-velvet rubber-backed cleaning Tape, two 3 in. tape spools and a bottle of the special Klenzatape fluid. It is claimed that by removing oxide deposits, dirt, etc., from the record and erase heads, it will eliminate interference with the magnetic impulses thus cutting out a major cause of distortion and improving sound reproduction. The whole operation is carried out in the time required to play 12 feet of normal recording tape. The whole kit is attractively presented in a modern style Blister Pack, which also includes a polythene wallet in which to keep the contents free of dust, etc., and retails at 12s. 6d. Replacement bottles of Klenzatape fluid retail at 3s. 11d. each. Further accessories for tape recorders are in active development and details will be announced shortly.

Manufactured by The Metro-Sound Manufacturing Co. Ltd., 19a Buckingham Road, London, N.1.



★  
A Medium  
Priced Portable  
Recorder  
The Spectone  
161

THE Spectone 151 has built up a very good reputation as one of the better medium priced tape recorders. Specto have now introduced a new recorder also using the Collaro Mk. 4 tape deck, this is the 161 which maintains many of the best features of the 151 but is of much smaller design, lighter to carry, and sells for only £51 9s. complete with an Acos 39-1 microphone. The 151 will continue to be produced for the enthusiast who requires the best quality.

The 161 incorporates many facilities not normally found in a recorder in this price range, these include superimposing; straight through amplifier; mixing of microphone and radio/pickup inputs; bar type level indicator; 15 ohm extension speaker socket; output from pre-amp stage, and provision for carrying 5 spools, three in a special compartment in the lid and two on the deck. The specification is: Frequency response 15 i/s, 50-16,000 c/s;  $7\frac{1}{2}$  i/s, 50-12,000 c/s;  $3\frac{3}{4}$  i/s, 50-8,000 c/s, all  $\pm 3$  dB. Hum and Noise, better than 56 dB below peak output. Bias and erase frequency, approx. 60,000 c/s.

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**Angus McKenzie** in **TAPE RECORDING & HI-FI MAGAZINE**

⦿ Sometimes, all too rarely, a product received for review has a quite outstanding performance and is reliable and robust. Such a product is the Simon SP4 . . . It has a superb performance in every way, with not one snag in the way of it . . . *Staggering Performance . . . Any owner of an SP4 can be very proud of it. I feel sure that this machine will go far to establishing a new standard of quality by which other machines will be judged.*

**Percy Wilson** M.A. in **THE GRAMOPHONE**

⦿ First-class marks for its comprehensive design, for its cleanness and thoroughness of construction, and for its excellent performance . . . *This is a tape recorder that is outstanding by any standards the world over.*

**J. Moir** in **THE TAPE RECORDER**

⦿ The novel features incorporated in the SP4 are generally of great value to the user, and are not gimmicks . . . The Simon machine is not cheap but it has exceptional facilities, a good performance, is undoubtedly good value for money.

**J. C. G. Gilbert** F.R.S.A., Assoc. I.E.E., M.Brit. I.R.E., F.T.S. in **MUSIC TRADES REVIEW**

⦿ At last with the Simon SP4, I have found a machine that is not only simple to use, but is capable of producing professional results . . . Has facilities only found in truly professional machines costing £350 and upwards . . . This machine, both in performance and appearance, is unlikely to be superseded for many years.

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Read what the press says, then come and see it for yourself at your nearest dealer—try it, test it and you too will join the crowds of Simon enthusiasts.

\* Automatic, in the Simon sense, is meant to be taken literally: it means continuous replay—the machine stops, reverses and changes to the other track with only a two-second pause, and *with no necessity to touch any control*. Similarly, up to three hours continuous recording can be made without attention, the machine automatically stopping at the end of the second track.

- SIMON AUTOMATIC DECK <sup>\*</sup> fully 'push-button-controlled'
- AUTOMATIC TAPE REVERSAL without touching controls
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- BASS AND TREBLE LIFT AND CUT with independent controls
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  - by special record 'safety button'
- ACCURATE TAPE POSITION INDICATOR
  - based on linear tape scale
- 'PIN-POINT' MODULATION with cathode ray magic eye

# simon SP. 4

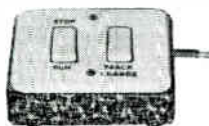


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# EQUIPMENT REVIEWED



★  
THE  
TAPLIN-HIRST  
BALMORAL  
STANDARD  
PLUS  
★

★ **Manufacturer's Specification:** Collaro Mk 4 tape transcriber. Frequency response 40–16,000 c/s  $\pm$  3 dB at 15 i/s; 40–12,000 c/s  $\pm$  3 dB at  $7\frac{1}{2}$  i/s; 50–8,000 c/s at  $3\frac{3}{4}$  i/s. Signal to noise ratio, better than -46 dB at 2 watts. Wow and flutter 0.15% at  $7\frac{1}{2}$  i/s. EM80 magic eye level indicator; separate record and replay amplifiers. Monitoring through own speaker Extension speaker socket. Output for Hi-Fi amp. from pre-amp stage. Valves, record, 12AC7 Input and frequency correction; ECL82 cathode follower to record head and oscillator. Replay, 12AX7 input frequency correction ECL82 Amplifier and output stage. Size 16  $\times$  14 $\frac{1}{2}$   $\times$  7 $\frac{3}{4}$ . Weight 34 lb. Price complete with 1,200 ft. of tape, crystal microphone and extension lead, £54 12s.

THE Balmoral recorder was examined with special interest as it is a relatively low priced machine from a newcomer to the industry, Messrs. Taplin-Hirst, of 22 Coram Street, London, W.C.1. At a price of 52 gns, complete with a crystal microphone, extension lead and 1,200 ft. of tape, it is definitely aimed at the non-professional user and cannot be expected to have the facilities normally provided on more expensive machines.

It incorporates a Collaro Mk. IV deck the overall dimensions of the case, 14 $\frac{1}{2}$   $\times$  15 $\frac{1}{2}$   $\times$  7 $\frac{1}{2}$  in., being only an inch or two larger in each direction than the deck mechanism itself. At a weight of 35 lbs. the machine is conveniently portable without the necessity of having a car close at hand. The case is finished in a blue and fawn imitation leathercloth, and has an attractive appearance, though the faint mottling on the fawn gives it a rather dusty appearance. A plain colour or a more prominent pattern might be an improvement in this respect.

### Only Two Controls on the Front

Apart from the usual push buttons on the Collaro deck there are only two other controls visible from the front, a replay gain control carrying a ganged mains switch, and a recording gain control, mounted one above the other in the left hand side of the speaker grille. Following current radio receiver practice there is no dial or any other indication of the function of either knob. On the right hand side of the speaker grille is a magic eye of the EM 80 type.

At the back of the machine is a small recessed panel carrying a "top cutter" tone control and three standard jack sockets for microphone, an external loudspeaker, and a socket allowing the amplifier to be used for public address or gramophone reproduction. No separate socket is fitted to allow a gram or radio input signal to be accepted if the microphone is in use. A separate mixer must therefore be used if a musical background is to be added to a speech (or vice versa).

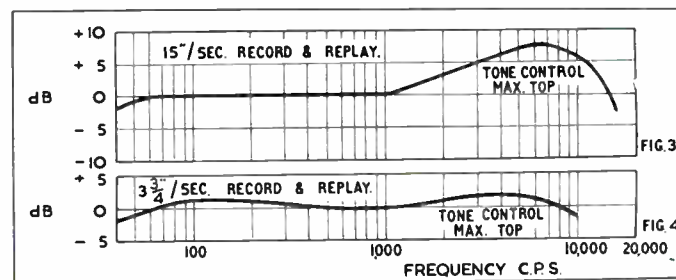
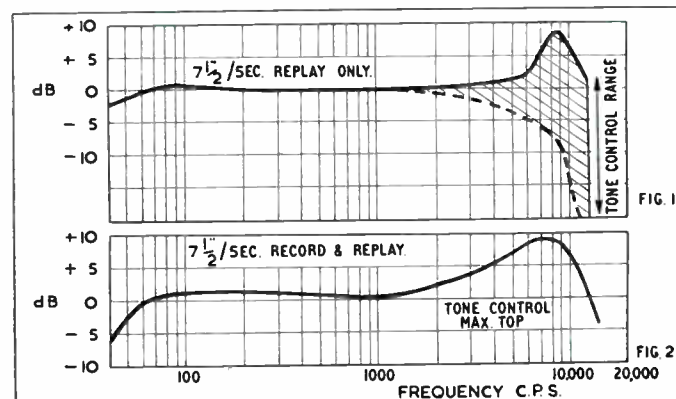
The Collaro decks are too well known to need any full description but it is worth noting that current production models are appreciably quieter than the earlier versions. This has been achieved at the expense of some loss of rewind speed, for it was noted that the (nominally) 1,200 foot spool of tape supplied with the machine required about 3.75 minutes to rewind. This a little tedious and, human laziness being what it is, it inevitably results in tapes being left wound inside out. The deck behaved normally, though the push buttons are a little heavy in action and have a rather sloppy feel in comparison to those fitted to many machines of continental design. This particular deck occasionally decided to do a high speed wind when the play button was depressed, a fault that has been noticed on some other Collaro

decks, but it generally achieved the desired result at a second attempt. After these general comments we can look at the results of the objective tests.

### Frequency Response

The replay response obtained using a standard test tape is shown in fig. 1, the dotted curve showing the range of the tone control. It will be seen that there is considerable "top boost" when the tone control knob is in the "max top" position, and as the tone control has no scale or dial there is no indication of the control position giving the response that is claimed to be "Corrected to C.C.I.R. standards from 40 c/s to 16 kc/s at 15 i/s". This tape speed is now of no interest to amateur users of a tape recorder, so it would really be of more value to have an indication of the position of the knob giving C.C.I.R. response at a tape speed of  $7\frac{1}{2}$  i/s. In any event there is some doubt whether the response of either machine tested would have corresponded to the C.C.I.R. specification.

When recording your own programme material it is the combined record and replay response that is significant. The result obtained



(tone control at its max setting) is shown in fig. 2, while figs. 3 & 4 display the combined record and replay responses obtained at 15 i/s and  $3\frac{3}{4}$  i/s respectively. All three curves show that the "Balmoral" machine has an adequate performance for amateur use, but in respect of frequency response the machine is not as good as some continental recorders recently tested.

### Wow and Flutter

The values of wow and flutter obtained on the many Collaro decks tested have varied widely from machine to machine, but none have been bad, and some have been exceptionally good. The values recorded on two Balmoral machines are given in table 1, the test tone being recorded and replayed on the same machine. It has been noted previously that the subjective annoyance produced by these speed irregularities is not adequately expressed by single figures such as are quoted in the table. Thus, when testing these two machines, it was noted that the reproduction at a tape speed of 15 i/s sounded appreciably smoother than at either of the lower speeds—though the values quoted in the Table for a tape speed of 15 i/s are not appreciably lower than the values obtained at a tape speed of  $7\frac{1}{2}$  i/s. The wow and flutter existing at a tape speed of  $3\frac{3}{4}$  i/s provide just tolerable reproduction

# Teletape



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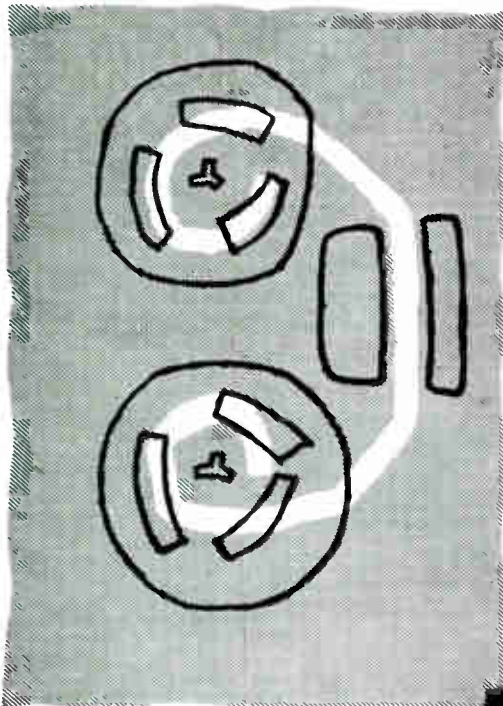
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# METRO-SOUND





**EQUIPMENT REVIEWED—(continued)**

of music, though the performance is completely adequate for speech recordings.

**Table 1—Wow and Flutter produced when recording and replaying**

Speed	W & F
3 1/2 i/s	.26%
7 1/2 i/s	.14%
15 i/s	.13%

The instant-to-instant variations in wow were appreciably lower at the higher tape speeds.

**Table 2—Signal/Noise Ratios**

Speed	Condition	(approx.)
3 1/2 i/s	Unweighted	25 dB
	Weighted	37 dB
7 1/2 i/s	Unweighted	25 dB
	Weighted	38 dB
15 i/s	Unweighted	32 dB
	Weighted	38 dB

**Signal/Noise/Ratios**

The signal/noise ratios measured at each of the three tape speeds are given in table 2, but the low values found for the "unweighted" condition require some explanation. For the weighted measurements, networks are introduced into the circuit to reduce both top and bass response in accordance with agree standards. In both machines tested, the noise remaining on the tape, after a 1 kv/s signal of full modulation had been erased, was found to have a large component at bias frequency and this is attenuated by the weighting networks. Thus there is a large difference between the weighted and unweighted values. Much of the remaining noise was apparently due to harmonics in the erase signal, for "wiping" virgin tape increased the tape noise

from 4 to 6 dB. Clearly some further work is required on the bias and erase circuits.

**General Comments**

The Balmoral is a simple machine with minimum facilities and a correspondingly low price. Reproduction is not sufficiently good to bring the machine into the high fidelity class, but it is good enough for simple usage. The recording volume indicator is troublesome to use, for the maximum signal is indicated by the "wings" opening to half an inch. This is difficult to judge; and in the machine tested the recommended value of "wing opening" resulted in the introduction of about 10 % distortion at the test frequency of 1 kc/s. On one of the machines tested, the Collaro deck was a little erratic in operation, rather suggesting that the factory inspection had been a bit too superficial. Though a socket is provided to allow an extension speaker to be used, the internal speaker cannot be disconnected when the external speaker is in operation. This is a real nuisance, for the performance of the small internal speaker cannot be expected to equal that of a large unit, and it is annoying to have it twittering away in the background all the time. The operating instructions with the machine are hardly sufficient to meet the needs of a tyro owner.

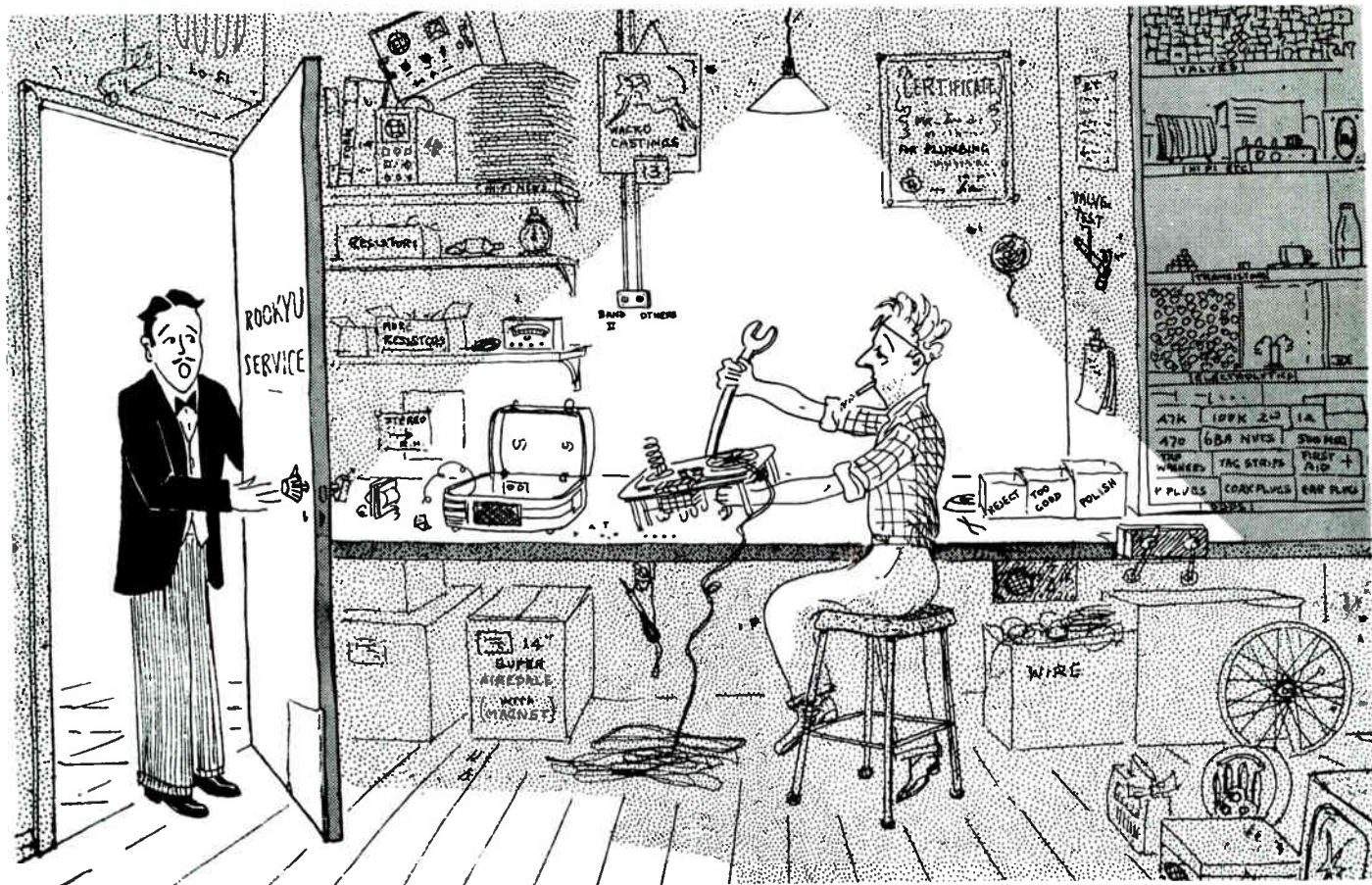
It is worthy of further investigation by anyone in search of a simple, easy to handle recorder who does not require the full range of professional facilities. Particularly as I understand from the manufacturers a number of improvements have been made since this model was submitted for review.

J. Moir

★ **Manufacturer's Comment.** An oscillator coil of the potted core design has now been introduced to reduce harmonics and ensure a clean wave form, this minimises tape hiss and considerably improves the signal to noise ratio.

We are surprised that the reviewer has made no mention of the use of separate record and replay amplifiers, as we feel that by the use of these we can produce a competitively priced recorder that combines reliability with a better top frequency response. We have also introduced a new and much improved cabinet design.

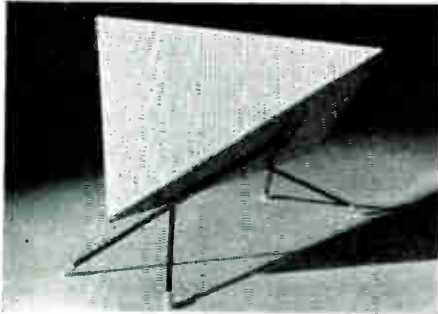
Taplin-Hirst



"—and he wants the recording checked to a semitone above middle C . . ."



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# our readers write . . . . .

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

## . . . about unbreakable spools

From:—S. Jepson, ARPS, F.J.I. "Brentcliffe", St. Aubin, Jersey, C.I.

Dear Sir:—I see you welcome small items helpful to others. Here are two:

1. The small rubber 8 mm. cine spools which cinemaniacs in this gauge get from processing stations (and generally find surplus) are ideal for storing long sections of tape for library sounds, or sending through the post. They also fit and play on portable machines and others.

2. These rubber spools have a slot in the edge for securing the film (or tape) with a rubber band, right across the spool along the diameter. Similar slots can be cut (and smoothed) with a hacksaw or fine file in larger spools to hold tape inside neatly. Yours etc.

## . . . about poor salesmanship

From:—D. L. Gardner, 57 Sparrow Farm Road, Stoneleigh, Surrey.

Dear Sir:—I enjoy reading your magazine every month, and am at the moment in the position where I want to purchase a tape recorder for the first time. Having acquired a fair amount of introductory knowledge from books and friends in-the-know, I set out to listen to various makes wherever they were being sold, my price location being approximately £60.

Imagine my amazement when one demonstrator did not even know the controls, then obtained squeals and grunts from the microphone, and ended by saying that "in order to hear the recorder at its best the recording must be well done". The recording, by the way, was taken from a radiogram externally, and not by plugging in!

That has been my worst experience in this connection, but I have since visited several other agents, all of which showed little knowledge of how to produce the best from their instruments, following up with apologies for "poor recording", and of course to really hear it, you must connect up to an external speaker, I stated I was fully aware of better results being obtained by additional equipment, but I wanted the best self-contained recorder, as a unit, for my money.

Tape recorders are now becoming increasingly popular in the house, but I should like to stress the great harm that is being done to the industry by the general lack of interest shown by the stockists. Perhaps something can be done by making this known far and wide, and also by suggesting that makers of the instruments check on the way their recorders are being mishandled in demonstration; or that the makers only appoint agents who satisfy them as to their capability of giving a proper showing.

I have at long last found what I want, but only after much comparing of specifications, advice from outside the industry, and approaching the manufacturers themselves for a proper demonstration, when they really did put the instrument through its paces, to my great satisfaction. Yours faithfully

## . . . about tape in Rhodesia

From:—J. S. Mann, P.O. Box 157, Broken Hill, Northern Rhodesia.

Dear Sir:—I have recently bought a Grundig TK20 Recorder and so become one of the "new boys". My object was to use tape to add sound to my 8 mm. movies, but I find the recording aspect as fascinating as the movie-making!

As this part of the British Commonwealth is very much in the news just now I wonder if any of your readers would like to correspond with me (on tape, of course!)—I shall be only too happy to reply to

those who would. I have no doubt that most interesting exchanges of opinion would result, as well as offering the opportunity of discussing matters pertaining to tape recording, movie-making and any other subjects in which your readers may be interested. Yours faithfully

## . . . about slower tape speeds

From:—K. Short, Managing Director, Recording Devices Limited, 95 Villiers Road, London, N.W.2.

Dear Sir:—I should like to refer to the recent review by Mr. Moir in which he reviewed the Stuzzi Mambo Tape Recorder.

A review of this type is intended to be unbiased and naturally, I respect Mr. Moir's views of the machine he had to work with, although, it is perhaps only fair to mention that we generally get rather better results both as regards wow and flutter, and frequency response. However, the main purpose of my letter to you is to comment on his more general remarks about tape recording and tape speeds which are applicable to something like 75% of all domestic tape recorders sold in this country.

In the first place it seems to me that I can detect a certain professional bias against the lower tape speed of 3½ in. There are by now quite a large number of machines on the market which I believe offer a very excellent performance at 3½ in. both in electrical terms and wow and flutter, which of course, is a mechanical quantity. They are, in any case, good enough that even very exacting pieces of music can be played on such machines with complete satisfaction and without aurally detectable speed variations. In fact, the tape speed of 7½ in. per second is obsolescent for domestic machines and all the most widely sold recorders employ the lower speed of 3½ in.

Regarding pre-recorded tape, I was surprised to find that Mr. Moir considered it a disadvantage for any machine not to be able to play the pre-recorded tapes as currently available in this country. The percentage of tape recorder users who bother about pre-recorded tape, is so small as to be utterly negligible and again, by far the largest majority of machines do not play these tapes and in practice, this has not been found to be a sales deterrent in any shape or form. The reason, of course, is that the available repertoire is very narrow indeed and it is patently obvious that the one company issuing these tapes are not very interested in the venture themselves. On the Continent and in the United States, pre-recorded tapes are, and have long since, been available at the slower speed of 3½ in. and in those countries serious efforts are being made to widen this repertoire so as to create an interest in pre-recorded tapes. In fact, the position in this country is that any one interested in making or selling pre-recorded tapes would have to issue them at the tape speed of 3½ in. per second if he wanted to sell sensible quantities since that is the speed at which the largest number of recorders used domestically, operate. The speed of 7½ in. is, for domestic machines, on the way out.

In conclusion then, I think that we must encourage the forward movement to lower tape speeds and accept what has already been done in this field, unfortunately, so far almost exclusively by Continental companies, and judge the progress on merit alone and without reference to what "has been". Yours sincerely

## . . . about copyright

From:—M. G. Barber, Secretary, The League of Dramatists, 84 Drayton Gardens, London, S.W.10.

Dear Sir:—As some of your readers may, from time to time, be contemplating making recordings of plays I hope that you will find an opportunity of making it clear to them that anyone wishing to make a tape recording of a copyright dramatic work must first obtain the permission of the copyright owner. An unauthorised recording constitutes an infringement of copyright.

Your magazine is most interesting and instructive and I am sure that you would not wish to leave your readers in ignorance of the correct procedure for all types of recording. We would be grateful, therefore, if you would bring this matter to their attention, either by publication of this letter, or in any form that lends itself to the policy of your magazine. Yours faithfully

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Verdik S1	45	6 5 0	3 8 4
Elektron	47	6 17 6	3 10 0
WyndSOR Viscount	49	6 19 0	3 14 2
Spectone 161 (Ex. Tape)	49	6 19 0	3 14 2
Grundig TK 20	52	7 0 0	3 19 4
Dulci Harting Deck* with pre-amp	55	7 5 0	4 3 4
Elpico	55	7 5 0	4 3 4
Telefunken 75 with microphone	55	7 5 0	4 3 4
Saja Export	56	7 6 0	4 5 10
Brenell 3 Star	58	7 10 0	4 9 0
Veritone Portable	58	7 10 0	4 9 0
Truvox R2	59	7 19 0	4 10 0
Grundig TK 25	62	8 2 0	4 15 0
Telefunken Deck*	63	8 3 0	4 16 8
Philips 8108	63	8 3 0	4 16 8
Elizabethan Essex*	65	8 5 0	5 0 0
Veritone Venus*	66	8 9 0	5 2 6
Brenell Mk V with microphone	69	8 11 0	5 5 6
Stuzzi Magnette	69	8 11 0	5 5 6
Grundig TK 30*	72	9 12 0	5 10 0
Telefunken 85*	75	9 15 0	5 15 0
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OUR READERS WRITE—(continued)

From:—H. R. Jones, 442, Poole Road, Branksome, Poole.

Dear Sir:—How many times have recorder enthusiasts found to their dismay the advantage of having two microphones, but have been unable to afford to buy an extra one. I have found myself in this predicament more than once but have been able to overcome this difficulty by using a permanent magnet cone loudspeaker plugged into the mixer unit. One does need extra gain on the volume control, but it does work and exceedingly well, as I have found on more than one occasion.

Yours sincerely

\* \* \* . . . about us

From:—D. Hartley, 143, Maidavale Crescent, Coventry.

Dear Sir:—Having read your first three editions of "The Tape Recorder", I feel that I must have my "ten cents" worth before you go any further. I for one do *not* think that yours is an "excellent magazine", it has in it too many "surveys" of equipment, we can find out this sort of information from manufacturers' adverts., there is no point in repeating it. Let us have articles on how to make things. I think you must assume that the people who buy your magazine can all afford to buy one or two tape recorders, together with the ancillary equipment necessary to make them versatile. There are people around who like to do things for themselves, you know, I don't think they are a minority, and I don't think you are catering for them.

Let us have articles on a par or better than, those in "Hi-Fi News", articles and circuits on tape amplifiers, bias and erase oscillators, mixers and how to assemble a tape recorder and hi-fi system into a cabinet, and then get rid of the hum. How does one make a bulk eraser? I know, but I'm sure a lot of your readers don't, and I think a lot of them would be interested. Your magazine has great possibilities so please don't make it into a catalogue of manufacturers' equipment, let's have some good meaty articles on how to make things for ourselves.

Regarding the fixing of "Arrow Tabs" on to the back of tape to mark the start of passages (April 59). "Arrow Tabs" are rather thick for this purpose and tend to make the transport mechanism snatch, much better to use standard splicing tape, or why mark the tape at all, why not lace small pieces of paper in between the tape at the required places, I've used this method for years, it works very well.

Yours faithfully

From:—F. B. Littler, 8, Copland Place, Coventry.

Dear Sir:—I have read your three mags. to date and, so far, there has not been one article of vital significance to the serious tape recordist. All your articles to date have contained information which is either (a) Common sense, or (b) data which is obtainable from several other sources. For example—Mr. Lewis York imparts information which is already supplied (in not such puffed up form) by the tape deck makers. Why, with all his good intentions, didn't he explain how to adjust the bias level on the tape amp. for different types of tape. The same applies to the article on Hum and Noise. I am quite certain that the majority of tape enthusiasts know to their cost just what hum and noise are, but do they know that a humdinger coil placed in the right place can cure 80 per cent. of the hum trouble. In short, let us have more technical information.

How about a series of articles on—marrying up a tape unit to an existing Hi-Fi outfit, circuit and construction details of a good four channel mixer unit, tape amplifiers, various types of mikes. There are a hundred and one subjects to choose from—any one of which could turn your (and my) magazine into a very informative piece of literature. Your prizes of spools of tape could do better if they went to writers who give advice instead of those who spend all their time buttering up the mag. and editor. What you want is brickbats not bouquets: this will give you a sense of realism and not one of false security. My own set-up incidentally is a Collaro Tape deck, Mullard Tape amp., Lenco Turntable and Mullard 5/10 Amplifier.

I hope this letter will help guide your future policy to the benefit of us all.

Yours faithfully

From—R. D. Geere, 182, Broadlands Avenue, Enfield, Middx.

Dear Sir:—On reading the correspondence in the April edition, I notice two letters criticising manufacturers for failing to produce various articles, namely a time-switch and a battery operated portable recorder. I feel such writers lack ingenuity, for also on the same pages occur letters from two other readers, exploiting their use of time switches. This shows that I am only one of many tape recorder

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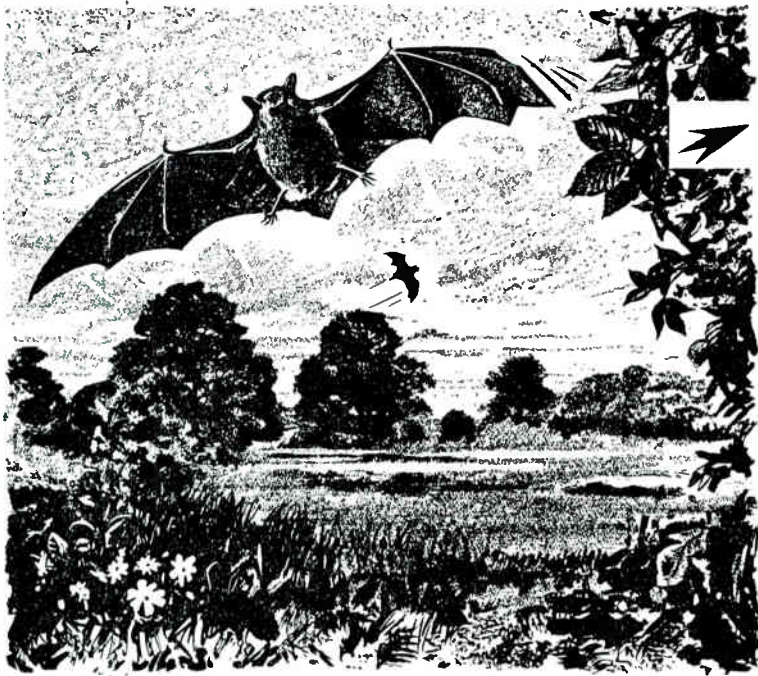
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OUR READERS WRITE—(continued)

enthusiasts who have devised some time-switch arrangement. The system I adopted several years ago was to use an alarm clock for switching on, and a micro-switch, tripped off by the tape as it ran off the spool.

Almost a year ago I started designing a portable recorder, inspired by the E.M.I. model L2 which is often in outdoor photographs, not to mention the front cover, of "The Tape Recorder". I am a skinflint when it comes to buying batteries, so I found a disused wind-up gramophone motor (there are many still available) and set to with half a dozen transistors in building a record and replay amplifier. At the end of six months, however, I had a large heavy cumbersome machine which would play back with poor quality and much wow. This was quite apart from the mechanical whirring and scraping noises for accompaniment. This machine has now been rebuilt with a Gramdeck attachment and control unit, and fitted with an output/monitor stage.

The recorder as it stands is little more than £14 in cost although twice that figure in weight. This is largely due to the prime-mover. Apart from its weight, the machine conforms to Mr. Penfold's specification with the following extras:—1. Microphone provided. 2. Speed continually variable (uses governor). 3. Erase facilities—permanent magnet. 4. 7 in. reels if desired. 5. Internal loudspeaker or headphone monitoring. 6. Level meter in course of construction.

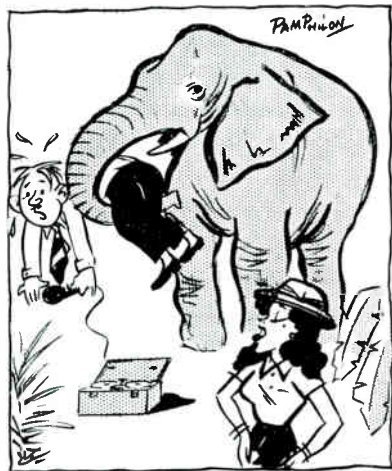
The batteries do not supply the motor and consequently have a greatly increased life. Wow is not audible and the recorder runs for 10 minutes without rewinding the motor. Rewinding does not affect the operating speed, neither does movement of the recorder, since it has no flywheel. The machine is not of wire-recorder size, but is still, nevertheless, as portable as the E.M.I. L2 machine, although somewhat inferior in other respects.

*Yours faithfully*

\* \* \*

From:—R. Bryan Smith, 141, Finsborough Road, S. Kensington, S.W.10.

Dear Sir:—I am writing this on April Fools Day. I have just had a most ingenious practical joke played upon me, which I think will interest your readers. Last month you very kindly published my letter asking for recordings of high fidelity elephants. Well, this morning



"Really Cedric, aren't you carrying this recording business a little too far!"

my mail included a truly frightening elephant. The commentary on the tape claimed that it was recorded in the deepest jungle, and indeed it sounded like that. The most sinister beasts could be heard in the distance. My correspondent assured me that if I listened carefully I should be able to hear the roar of a Welsh elephant — "an almost extinct species".

The tape continued with the sounds of a Welsh elephant being shot. The jungle was silent as though "the animals sensed that some great catastrophe was about to happen". Then the blast of the elephant gun echoed through the forest and the last dying cries of the great beast were heard. "Terrifying" said the commentary "Terrifying! I was puzzled for some time as to how the recording was made. But after I had experimented with it I discovered that when it was played at 15 i/s instead of its stated 3½ i/s the jungle beasts became magically transformed into sparrows chirping in a wood, and when it was played at 30 i/s the dying cries of the Welsh elephant became the noise of a startled blackbird! I should very much like to thank those of your readers who have sent me recordings of elephants and to say that I should be very pleased to receive any others. I will send in return copies of the recordings I now have of elephants—including Welsh ones.

*Yours sincerely*

\*Note:—This elephantime column is now closed. Editor

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Advertisements for this section must be pre-paid, and accompanied by a postal order, money order, or cheque, made payable to "The Tape Recorder", 99 Mortimer Street, London, W.1. 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.

No responsibility will be accepted by the editor, the publishers, or the printers of "The Tape Recorder", for the quality of any goods offered, bought, or exchanged through the medium of these columns, or for any failure in payment, etc., though the greatest care will be taken to ensure that only bona-fide advertisements are accepted.

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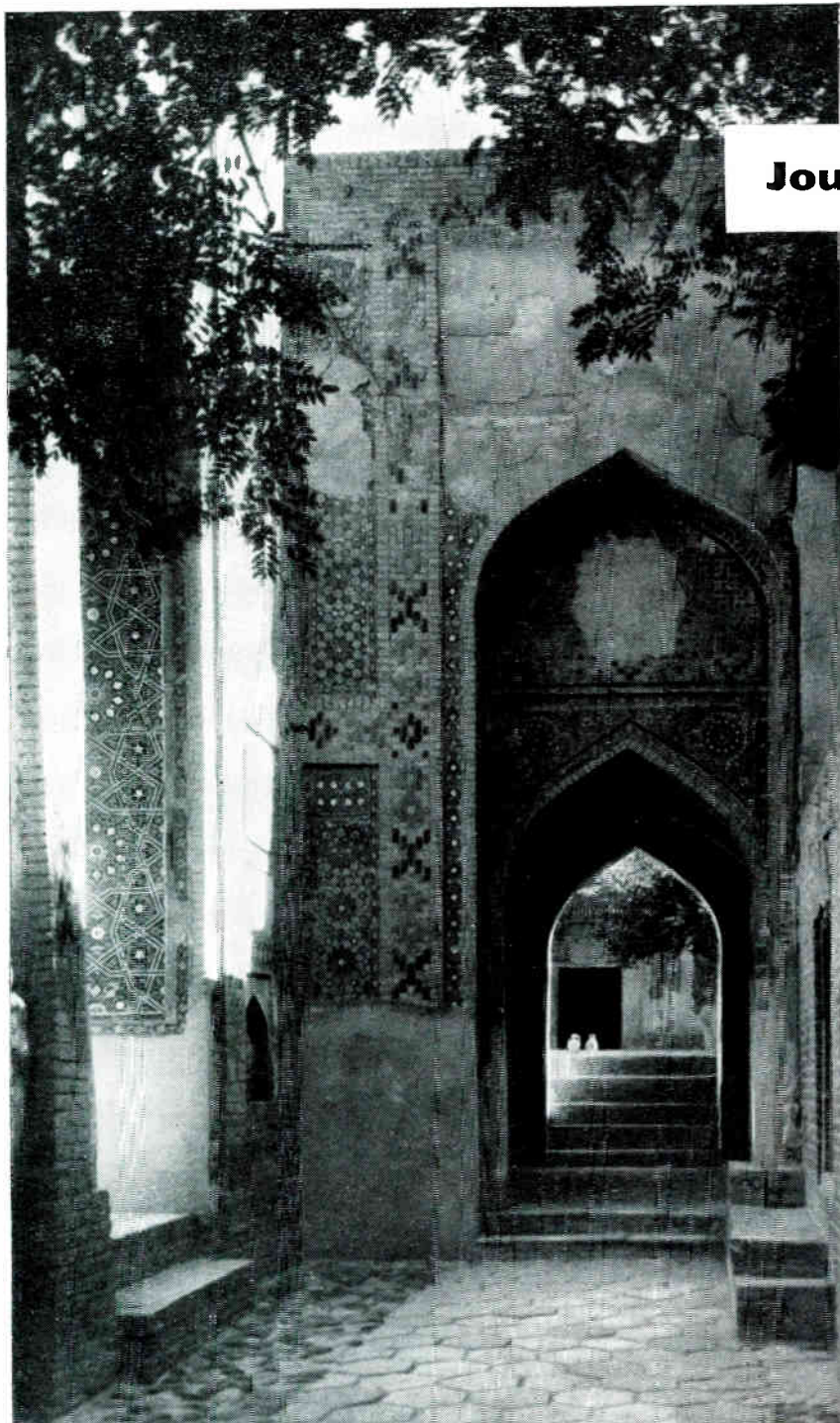
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GS 151

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*Hi-Fi Year Book* (1959 edition) is available through all the usual distributors, including Hi-Fi Dealers. Or it may be obtained direct from the publishers, posted by return to any address in the world, price 11s. 6d.

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