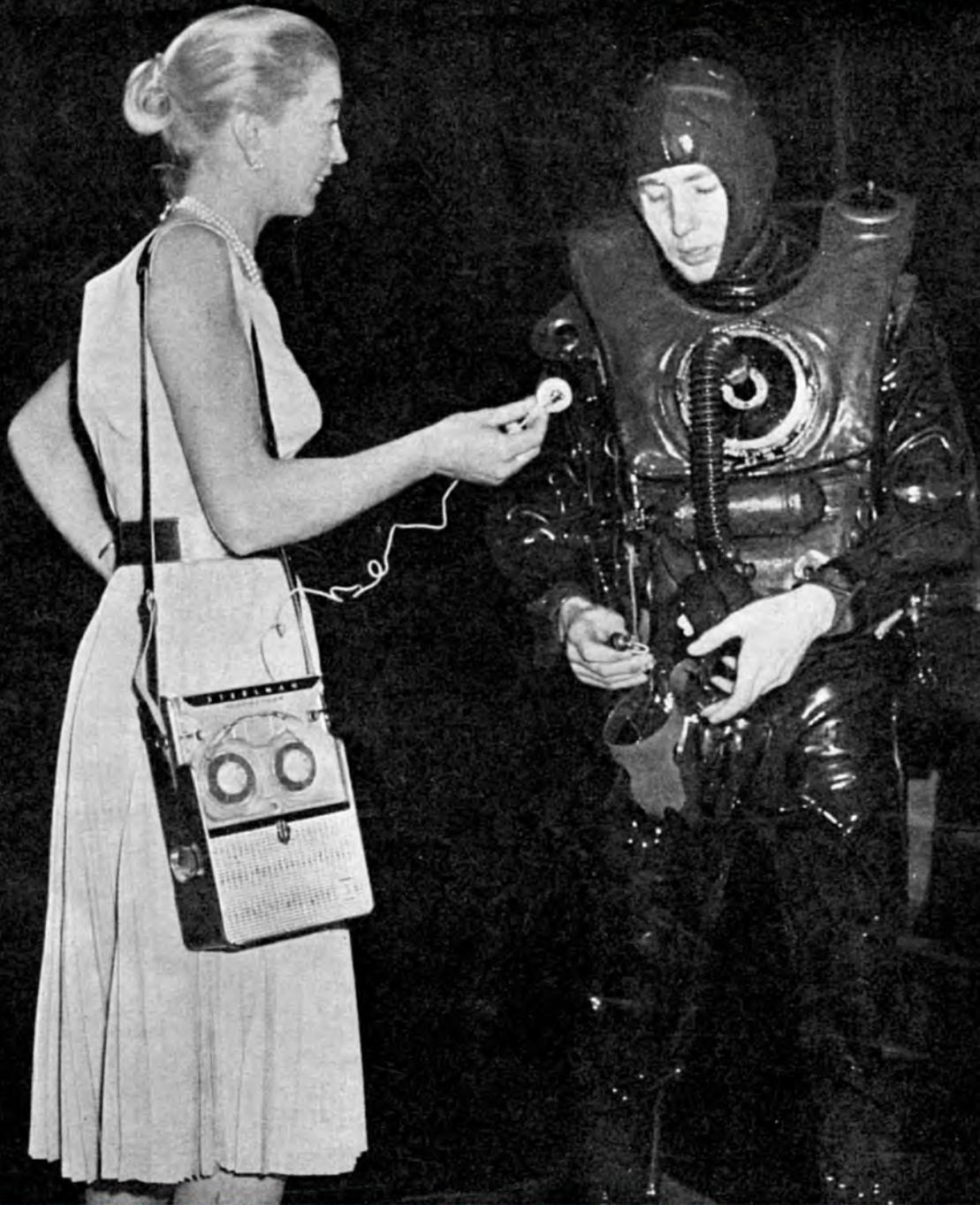


the TAPE RECORDER

PRICE 1/6

February 1960

Vol. 2 No. 1



IN THIS NUMBER

- Field Trial of the Steelman "Transitape" battery-operated portable
- Recording railway sound effects
- A Beginner's Recorder to build in easy stages--Part 6
- The Recorded Production was by . . . You
- Tape Recorder Workbench
- Details of New Products
- Club Notes and News
- Reader's Problems



The man who knows what's inside says—

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TELEFUNKEN Magnetophon **75K-15**

TWO TAPE SPEEDS 3½ ips and 1½ ips
FREQUENCY RANGE 60-16,000 cps at 3½ ips and
 60-9,000 cps at 1½ ips
PLAYING TIME 6 hours 20 minutes (5½" DP tape at slow speed).

Press button controls. Extra-sensitive braking and tape tension control system. Recording head with ultra-fine gap. Indirect fly-wheel drive. Fast rewind, quick stop button. Digital counter. Automatic tape-end stop. Connections for earphones, remote stop/start control and extension speaker. In attractive lightweight Styron Case.

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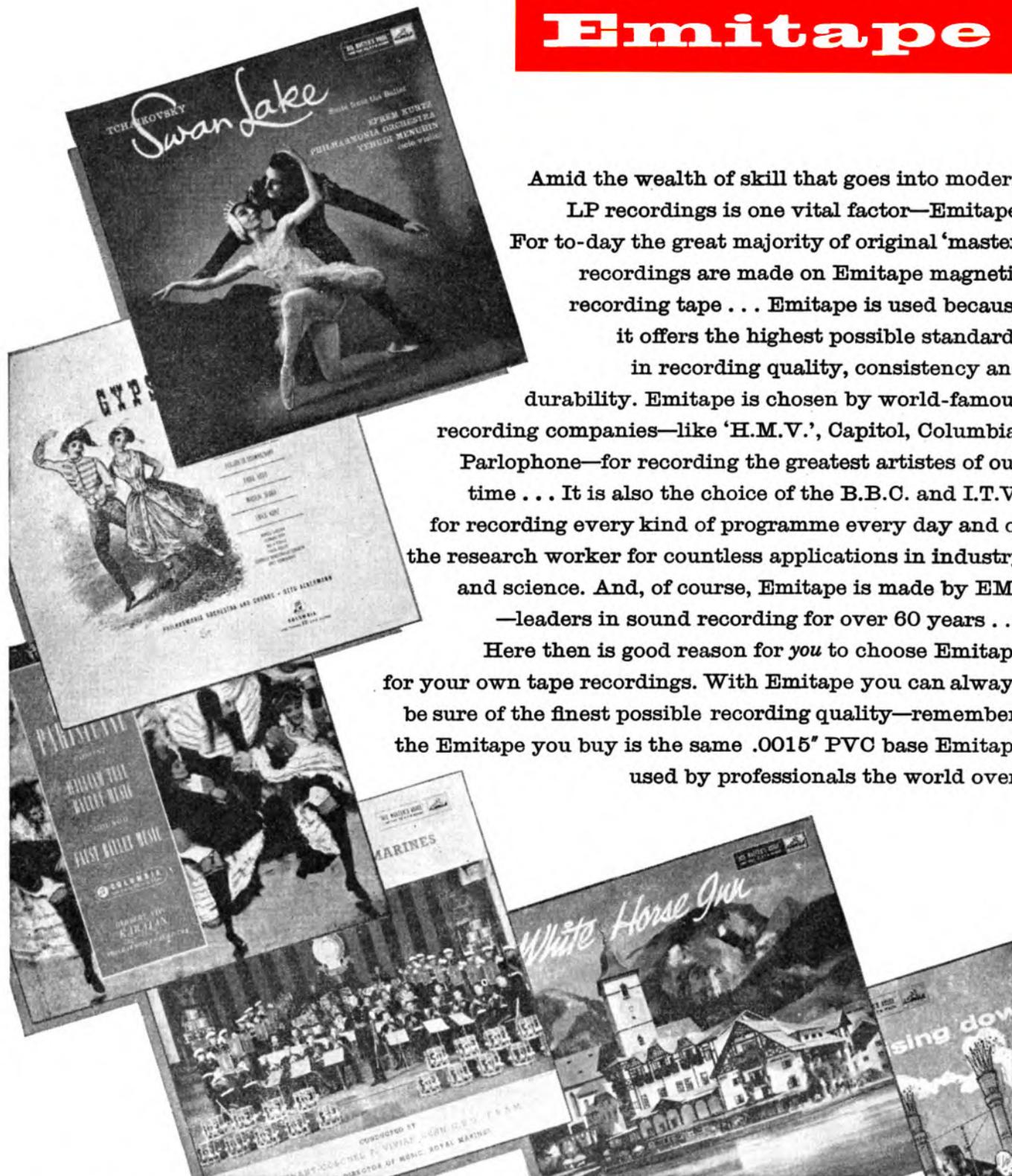
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Amid the wealth of skill that goes into modern LP recordings is one vital factor—Emitape! For to-day the great majority of original 'master' recordings are made on Emitape magnetic recording tape . . . Emitape is used because it offers the highest possible standards in recording quality, consistency and durability. Emitape is chosen by world-famous recording companies—like 'H.M.V.', Capitol, Columbia, Parlophone—for recording the greatest artistes of our time . . . It is also the choice of the B.B.C. and I.T.V. for recording every kind of programme every day and of the research worker for countless applications in industry and science. And, of course, Emitape is made by EMI—leaders in sound recording for over 60 years . . . Here then is good reason for *you* to choose Emitape for your own tape recordings. With Emitape you can always be sure of the finest possible recording quality—remember, the Emitape you buy is the same .0015" PVC base Emitape used by professionals the world over.



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SPECTONE 161 TAPE RECORDER

Three speeds: 3½, 7½ and 15 ips. Built-in facilities for (i) mixing all inputs, and (ii) superimposing on previous recordings. Latest type recording level indicator.

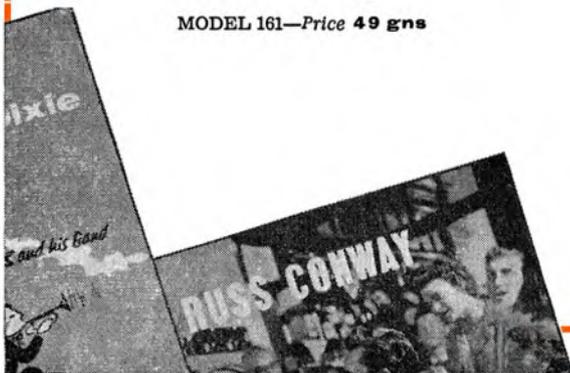
Two sets of recording, playback and erase heads enables continuous operation of both tracks without changing over spools. Plug-in for additional amplifiers and speakers.

Simple operation of controls:

- (i) mains on/off/tone control
- (ii) microphone/playback volume
- (iii) radio/gram volume

Conforms to C.C.I.R. specifications. Provision for 7" spool. Completely self-contained with compartment for microphone and mains lead. Storage space for three 7" spools while two may be safely carried on the deck itself (as illustrated). Modern cabinet fitted with locks and keys. Finished in cerise and Windsor beige leathercloth.

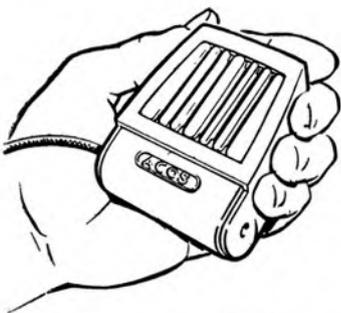
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ES/N/88

acos



FOR MIKES

MIC 40

The Acos MIC 40, for instance, is a neat, fold-away microphone, that either fits snugly into the hand, or stands on its own. One of the smallest microphones in the country, in attractive dual colours, the MIC 40 is standard equipment with many well-known tape recorders. It is also available separately from most good dealers. The price is moderate, and the sensitivity and sound reproduction are remarkably good. Acos also make several other, equally successful microphones in different price ranges.

COSMOCORD LTD WALTHAM CROSS HERTS • TEL: WALTHAM CROSS 25206 (London subscribers please dial WS 25206)

Two Years Guarantee

Not mass produced but virtually handmade for reliability and consistently high standard of performance.

MODEL R 30/R 40

1. $1\frac{7}{8}$ " ips can be fitted for an extra 3 gns.
2. Superimposing fitted as standard.
3. Mixing facilities.
4. Provision is made for the addition of a STEREO HEAD.

TECHNICAL SPECIFICATION

The R.40.

$1\frac{7}{8}$ ips 70—4,500 \pm 3dbs.

$3\frac{3}{4}$ ips 60—9,000 \pm 3dbs.

$7\frac{1}{2}$ ips 50—15,000 \pm 3dbs.

15 ips 40—20,000 \pm 3dbs.

(signal noise ratio at $7\frac{1}{2}$ ips—47dbs.)

Separate record amplifier.

Push-pull bias erase oscillator for low tape hiss.

Separate bass and treble controls \pm 15 dbs at 14 kc/s—15dbs at 40 c/s.

Supplied complete with Acos 39/1 microphone, Radio Record lead and 1,200' P.V.C. Tape.

FURTHER FACTS

It is not generally known that the Tape Deck mechanism is virtually re-built in the REPS machines. It is standard procedure to remove all rubber wheels—i.e., re-wind, idle and pinch—and re-grind them to a closer tolerance. Also the Capstan is skimmed to less than \pm 0.0001". This has resulted in a very low "wow" factor, especially at $3\frac{3}{4}$ ips which has led to the logical introduction of $1\frac{7}{8}$ ips in place of the 15 ips. The principal cause of "flutter" is due to the eccentricity of the three-step pulleys which control the tape speed. This eccentricity occurs when the pulley is locked to the motor shaft and is due to the off-setting action



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.

of the fixing screws. This difficulty has been overcome by manufacturing pulleys over-size and machining to the correct diameter when fitted to the motor shaft. By this method a total variation of less than 0.0001" has been achieved at $1\frac{7}{8}$ ips. Initial measurement indicate total "flutter" content at $1\frac{7}{8}$ ips to be of a lower order than previously associated with $3\frac{3}{4}$ ips.

★

D. W. Aldous of 'GRAMOPHONE RECORD REVIEW' writes in March issue :

"The overall performance of this Repls R.30 recorder, coupled with its reliability and simplicity of operation, not to mention an attractive styling, must give it a wide appeal to tape recordists seeking an all-British machine of unusual quality."

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Phone : Acorn 4141

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

Mr.....

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 Editorial Offices - - - - 99 Mortimer Street, London, W.1
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★

EDITORIAL

WITH this February number, we open our second volume; and never, it seems, has a year passed so quickly as the last one. In terms of a year of 12 magazine numbers, this is understandable, particularly when they are the first twelve numbers; because however clearly one might define an Editorial Policy, as a broad forecast, only a magician could tell which way the barometric needle of reader approval—or disapproval—would point from month to month. And so, as may be well imagined, ever since the first letter from readers reached this office last February, we have been more than pre-occupied with the ever-changing question—*where are we going?*

In broad terms, of course, the initial policy of the paper has not changed, because it is a very simple one (as stated)—to make *The Tape Recorder* the most interesting and reliable and informative journal of its kind in the world. Those, we know, are ambitious words; and when they are written sincerely they take a lot of living up to. We hope that we have succeeded in coming somewhere near to the spirit of them so far: we repeat our intention to try to justify them in still greater degree in the twelve numbers of this second volume.

In our view these same twelve months are going to make up a very important year for tape: possibly even more for tape as a musical medium than for the tape recorder as a device. There is little doubt in our minds that the tape recorder owner will soon be offered tape records as an alternative to discs. This is an inevitable development—if for no other reason, because the number of domestic recorders in daily use already offer a large and growing commercial opening; but we prefer to think that the move—when it comes—will be the first of a series of logical steps in the direction of a new form of home entertainment.

For sixty years and more the gramophone has been the “magic box”. As a reproducer of recorded sound it will, at its best, take a lot of beating; but the gramophone is only a sound reproducer. The new “magic box” is the magnetic recorder; and in its various developments (many of them probably still to be thought of) it has a potential future far greater than the gramophone. It records *and* reproduces. It is not merely the novelty of home recording that is behind the spectacular popularity of tape recorders. It is because the time is ripe for them. It is, perhaps, even the swing of the pendulum. For countless years—before the advent of the gramophone—entertainment was a form of expression. It was *created* in the home. Now, after years of canned music, the tape recorder offers its owner the additional and far-to-long-dormant means of expression. It is a very big and deep-rooted urge: and the tape recorder is a new medium for its revival.

It is therefore only a matter of time before the new “magic box” is duly acknowledged—and properly catered for, to enable it to perform its dual purpose. And, we repeat, the day cannot be far off.

FEBRUARY - - - - - 1960
 VOL. 2 - - - - - NO. 1

CONTENTS

	Page
Easy-to-make Tape Books	
By P. A. Trewartha	11
Here, There and Everywhere	12
Club Notes and News	14
Building a Library of Sound Effects	
(4) Railway Sounds	
By B. R. Read	19
Beginners' Recorder to Build in Easy Stages	
(6) HF Bias	
By A. Tutchings	23
“New Music” Competition—Results	25
Field Trials of Battery Portables	
(4) The Steelman “Transitape”	
By John Borwick	26
The Recorded Production was by . . . You.	
(1) Finding a play and choosing a cast	
By Stephen Grenfell	29
Readers' Problems	33
Reviewing Tape Recorders	
(2) Frequency standards	
By James Moir	35
Tape Recorder Workbench	
(9) Routine Maintenance	
By A. Bartlett Still	39
Details of New Products	41
Our Readers Write	43
Classified Advertisements	49
Advertisers' Index	50

COVER PICTURE

THE recent Boat Show at Earls Court, London, was the setting for our cover picture this month. One of the most popular of our newly introduced features is the monthly “Field Trial” report on the new battery portables. These recorders are used in turn by various contributors and staff members, and thoroughly tried and tested in the kind of usage they are likely to receive when sold. Here, Jean Clark, a “Tape Recorder” news editor, interviews a Royal Naval diver with the new Steelman.

NEXT MONTH

A. TUTCHINGS concludes his present series of articles on a simple transistor circuitry for a *Beginners' Recorder to Build in Easy Stages* next month, and gives some general hints on using the electronics with a deck. He has also promised to cover points raised by readers, and suggest modifications for other applications. The first in a new series on practical nature recording is also scheduled. The author is E. D. H. Johnson, who has accompanied the well-known photographer Eric Hosking on numerous expeditions, and begins by giving constructional details on building a parabolic reflector. All our regular features will be included, plus a further *Field Trial* of one of the miniature battery portable recorders, so order your copy now.



THE TAPE RECORDER FOR MARCH — ON SALE FEBRUARY 26

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).



I like the look of it—
a really nice piece of furniture for
the home—look at that lovely sapele
mahogany—so easy to use too—those
magazines—simple as putting on a record



I like its entertainment
value—my favourite
programmes, music,
recordings of the kids—I can
keep them—enjoy them when
I like.



I like the inside—not that
I'm allowed to touch it—
the amplifier's got a triode
push-pull output and there's
full control for treble and bass.



A magazine full of the
latest pops—it's just right for
parties and for dancing.
The built-in microphone is
great when the gang comes
round—you just talk at
it and it records.

for all the family



the Simon **Minstrelle** tape recorder

WITH MAGAZINE LOADING

Everyone likes the Minstrelle—and that's the way it should be, because it's the first tape recorder to be specially designed with the whole family in mind. Designer Peter Bell was commissioned to style a recorder as a piece of furniture that would fit with distinction into the home—and here's the brilliant result. Using tape magazines which you put on like

records—no threading or fuss—all the family can use it—even the young and not-so-mechanically-minded members. And inside that handsome cabinet there's a piece of electrical design and workmanship that you can be really proud of—built to ensure that you too, will "Choose Simon for Sound".

Price with the built-in microphone **39** gns. Easy Terms available.

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EASY-TO-MAKE TAPE-BOOKS

Designed by P. A. Trewartha

THE comparative practical and technical advantages of tape and disc is a subject of much controversy and, with so much to be said for either side, the argument and dissension bids fair to continue for some time to come. As a tape-man I can, of course, be smugly confident about the eventual outcome of the issue. The one point I must concede to the LP disc fanatic is aesthetic rather than technical and concerns the sleeves in which the discs are issued.

It is difficult to make favourable comparison between these handsome, elegant sleeves and the dull, uninteresting cartons in which our virgin tape is retained. Admittedly, by virtue of the nature of our medium, we cannot be catered for in quite the same way, and although there are some not unattractive tape-books on the market, the prices are just a little prohibitive and I for one would prefer to forego these luxuries in favour of more tape.

Very inexpensive

The Do-It-Yourself tape-books described here present, I think, a solution of the problem. The materials may be purchased at most handicraft stores for a matter of pence—spread over a half-dozen books the cost should not be more than 1s. 6d. per book—and with a little patience your tapes can be most attractively housed.

The cover itself consists of two pieces of hardboard, or stiff cardboard, covered with dyed and grained leather skiver or

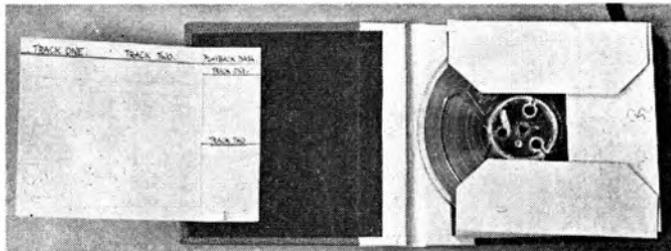


Fig. 5. The finished book, with information sheet attached.

book-binding linen. For a 7 in. reel of tape the pieces of hardboard should each be trimmed to $7\frac{1}{2}$ in. square. The sheet of linen or the skiver must measure 18 in. \times 9 $\frac{1}{2}$ in. and should be shaped as shown in fig. 1. The dotted panels "A" are $7\frac{1}{2}$ in. \times $7\frac{1}{2}$ in. and will later take the two boards. Section "D", which will form the spine of the book, is $\frac{7}{8}$ in. wide. Flaps "B" and

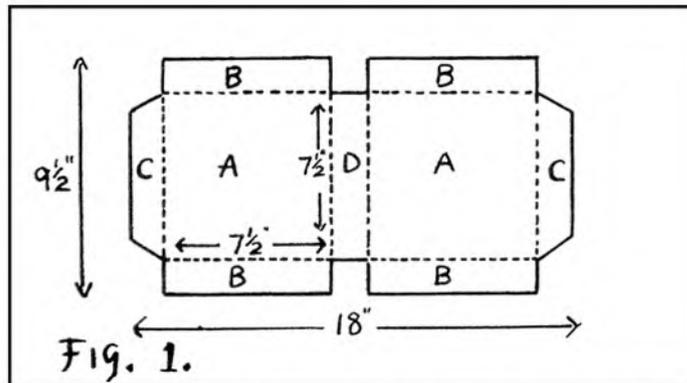


Fig. 1. Showing the dimensions of the outer covering, which may be of linen or skiver. See also figs. 2 to 4.

"C" are all 1 in. wide. Having shaped the skiver, the two hardboard squares are now pasted and set into the panels "A." Now paste the four flaps "B" and fold them around the edges of the boards. Lastly paste the flaps "C" . . . these having been previously mitred . . . and fold them in also.

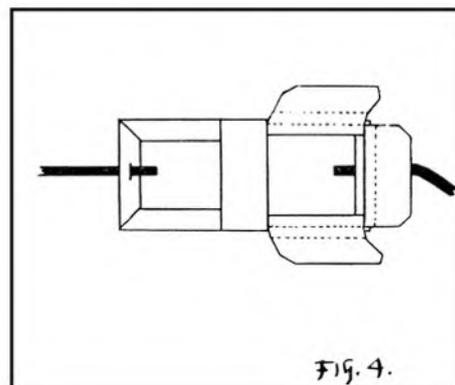
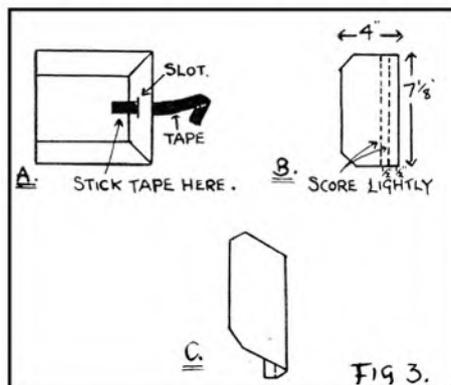
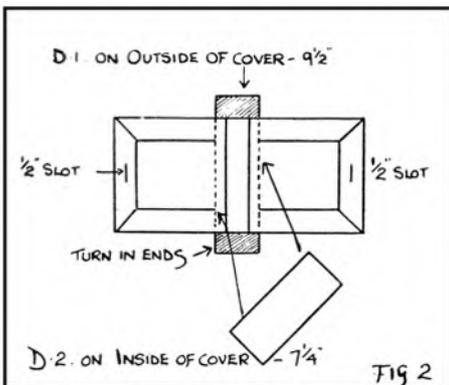
Covering the spine

Fig. 2 shows how two strips of a different coloured skiver of linen are used to cover and strengthen the spine. These strips should be 3 in. to 4 in. wide. Strip "D.1" on the outside of the cover should be $9\frac{1}{2}$ in. in length, allowing 1 in. at each end to be turned in. Strip "D.2" should be $7\frac{1}{4}$ in. long and is pasted on after the ends of "D.1" have been turned in. Also in fig. 2 are shown two $\frac{1}{2}$ in. slots; one on the outer edge of each cover. Through each of these slots is passed a 6 in. length of tape . . . NOT the magnetic variety . . . (fig. 3a).

These tapes will be used to tie the book in a closed position. Of course, if some form of clip is preferred for this purpose, the slots should not be made. Fig. 3b shows a piece of thin card cut to size and lightly scored. In fig. 3c this card has been bent along each of the scored lines. Three of these pieces will be required for each cover and they are affixed as shown in fig. 4. (A glance now at fig. 5 will make clear how the reels of tape will fit snugly under these flaps.)

The finishing touches

We now require two squares of black cartridge paper, each 7 in. \times 7 in. These are pasted one on the inside of each cover where they conceal the rough edges, ends of tape, etc. The last stage is optional but lends a professional touch to the finished article. A piece of card of a light colour and cut 8 in. \times 6 in. is scored and bent two inches from one end. It is then pasted on to the left-hand cover (fig 5) and makes a useful and neat information sheet. And so we arrive at the finished article. All measurements can be scaled up or down . . . presupposing the necessary mathematical ability . . . to suit tapes larger or smaller. May the appearance of your collection be enhanced and your pleasure proportionately increased.



HERE AND THERE AND EVERYWHERE



● *Not for home consumption! Here is a 12½-inch reel of the latest tape product—E.M.I. Videotape. Compare it for size with the familiar "Message" spool of standard recording tape, which can be seen beside it. On the big reel is sufficient tape for a TV programme of one hour's duration—4,800 feet of it. Price, for your notebook, £140 2s. But unless you have £22,000 to spare for the Videotape recorder, don't worry! A 2-page article, "Pictures on Tape" appeared in Hi-Fi News, November 1959.*

AN item of interesting news from E.M.I. is that they are now in full production of Videotape. Behind this rather brief statement lies a story of considerable enterprise and no little energy. It was only about 18 months ago that the first Ampex Videotape recorders came into use in the U.K., and from that point in time the E.M.I. scientists and engineers began work. Today, not only is the tape being supplied to television studios in Great Britain, but samples have been sent to America where they have been very favourably received.

Big Business

At first sight, it might not appear to be a very large business, when one considers the vast market for standard ½ inch tape that is used on domestic and professional sound recorders, and the comparatively few TV stations in the world. However, the fact that with one country alone, where Ampex Video machines are in use, a contract for 2,000 reels of tape is being negotiated, makes one think a second time—particularly when it is realised that a 4,800 foot reel of this Videotape costs £140 2s. net!

Our first picture on these news pages shows a 12½ inch reel of the new tape, compared with a 3 inch "message" reel of standard ½ inch tape. The Videotape giant holds enough tape for a full 1-hour programme of television pictures and

sound. The tape width is 2 inches, and the playing speed is 15 i/s from reel to reel. But the "sound" and "video" heads are separate. The Video heads rotate and scan the tape transversely, and this additional motion, together with the standard left to right spooling, results in an effective recording (and re-playing) speed of approximately 1,500 i/s. Such a speed however it is achieved, must make very great demands upon the tape; and E.M.I. can already claim for their Videotape that it has exceptionally good resistance against the everyday wear-and-tear that must be expected. The oxide coating has a high surface finish to reduce friction and the incidence of "drop outs," and the oxide coating has good adhesive properties. The tape base is Mylar, one thousandth of an inch in thickness.

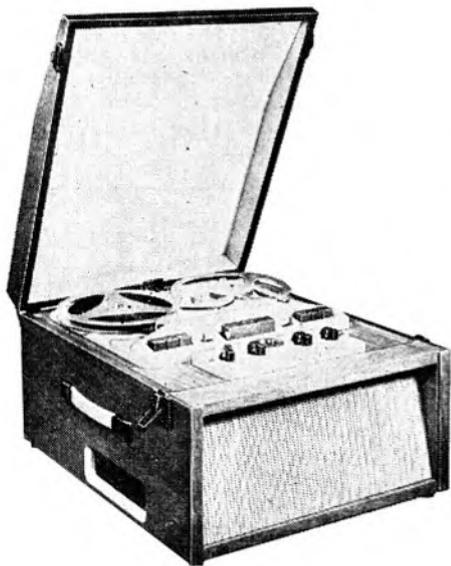
MUSIC on Tape Ltd., of 6 Laurence Pountney Hill, London, E.C.4., ask us to remind readers that they have been issuing pre-recorded tapes now for nearly eighteen months on the *Music on Tape* label, and have no connection whatsoever with any other tape or disc company.

LEE Products (G.B.) Ltd., who recently acquired the trade name and manufacturing premises of Dulci, announce that their distribution network for Audiotape is now working smoothly, and that Audiotape is now available throughout the U.K. Any readers who have difficulty in obtaining this should drop a post-card to Lee Products (G.B.) Ltd., 21 Longford Street, London, N.W.1.

Tape Recorders For Schools

OUR recent notes, news and pictures about tape recorders for use in schools, have brought us as many queries as comments. And the two illustrated features about the interesting development of recording at the Rochester School have apparently triggered off many similar moves in other parts of the country. We welcome news and pictures of all developments in this important field.

In the meantime, from **Clarke & Smith Mfg. Co. Ltd., Melbourn Works, Wallington, Surrey**, we have received details of two models of recorders which they have designed in consultation with certain Education Authorities. These robust instruments are already in wide use, and we suggest that those interested should write for particulars.



Two school recorders by Clarke and Smith. Left a CTR 4 which uses a Collaro deck. Right, the STR/4 with a modified Wearite deck.

HERE AND THERE AND EVERYWHERE *cont.*

THE boom in sales of dictating machines has reverberated back on to the tape-typist. Of the many firms specialising in this field, **Tape Typing Ltd.**, of 12 Kingly St., London, W.1., employ a full-time staff of fifteen on transcription of Stenorette tapes, and supply and hire machines into the bargain. The business was founded by Miss Foster just over five years ago, working from her own flat. The net has now spread far and wide, and work is often received now from the other side of the Atlantic, when time allows! The bulk comes from the London region naturally, and Tape-Typing run a twice-daily delivery service in and around the Central London area, so that letters dictated in the morning are back and ready to sign before stumps are drawn for the day. Conferences, books and translations all pour in, in a variety of sizes, shapes and speeds, not to mention languages. It would appear that there is but one proviso: recordings can be plain bad, the material bewilderingly technical or the accent impossibly foreign, but the combination of all three is a bit much!

A NEW company, called **D.G.C. Ltd.**, has just sprung up in the field of tape records. The principal purpose of this new venture is to handle the production and distribution of tapes on the present Colrich label, and the Directors are D. Gerald Collingwood and Mrs. J. N. F. Collingwood, late of Colrich Audio. However a new catalogue is promised for the

near future, with a whole range of French, Scottish and English music, in both stereo and mono, and at both 7½ i.p.s. and 3½ i.p.s. More details in *The Tape Recorder* next month.

D.G.C. Ltd. are also producing and distributing speaker enclosures, stereo systems, tape players and Hi-Fi equipment generally. A speciality of the firm is equipment for restaurants and hotels; moreover D.G.C. Ltd. have, for some months, been specialising in custom-built stereo systems in a very reasonable price range. All enquiries to D.G.C. Ltd. Suite 9, Evelyn House, 62 Oxford Street, London, W.1.

Unesco Sound Library

Further evidence of ways in which amateurs, working solo or in groups can be of positive help on an international project is contained in this announcement from the Federation of British Tape Recording Clubs.

Federation Internationale des Chasseurs de Son (FICS) is collaborating with the United Nations Educational, Scientific and Cultural Organisation (UNESCO), in a scheme designed to widen the scope of the UNESCO Sound Library. FICS will supply to UNESCO recordings of sounds which are typical of their country of origin. These recordings will be obtained by FICS from its various national organisations, each of which has agreed to arrange for the collection of suitable recordings from its mem-



The photograph above shows Mr. Durlacher, Industrial Sales Manager, Cine and Photographic Division, Rank Precision Industries Ltd., demonstrating how commentaries can be put on to 16 mm film. The photo was taken at the recent Scottish Industrial Film and Equipment Exhibition in Glasgow. Simply by speaking into a microphone, the commentary is magnetically added to the oxide stripe on the film as it runs through the projector—a Bell & Howell Model 640. Watching the demonstration are (left) Mr. W. A. Murray of W. A. Murray & Co. Ltd., Glasgow, and Mr. Millner of Hoover Ltd., Cambuslang.



NEWS FROM THE WORLD OF TAPE

● Congratulations to Cardew "The Cad" Robinson, and to all those who gave up their time over Christmas to bring a ray of sunshine to others less fortunate than themselves. This year "The Cad" visited the Northwood Sunshine Home for Blind Babies and presented them with a new Elizabethan 'Avon' complete with taped messages from the cast of Humpty Dumpty at the London Palladium. Roy Castle introduced Mary Mary Quite Contrary, with Sally Smith, Tommy Tucker, Gary Miller and the one and only Humpty, Harry Secombe. Three more of these recorders are to be given to other Sunshine homes.

bers. Those which are of a sufficiently high standard will be included in the UNESCO Sound Library, from which recordings are made available to broadcasting organisations throughout the world.

The Federation of British Tape Recording Clubs has the responsibility for organising the collection of contributions from recordists in Great Britain, and for submitting them to UNESCO.

A supply of forms, one of which should be completed and sent with each recording submitted, is available from the address below, together with a leaflet which gives more detailed information concerning the type of sounds required and the arrangements for payment which have been made with UNESCO.

All recordings received by FICS will be retained until May 1960, before being sent to UNESCO. This is necessary in order to avoid undue expenditure on postage, packing etc. Contributions for inclusion in this first batch should arrive by March 31st 1960 at the latest. Those received after that date may be retained for inclusion in a later collection.

We are sure that there must be many suitable recordings in the possession of Clubs and individual recordists in this country. In order to submit recordings, it is not, of course, necessary for your Club or Society to be a Member of F.B.T.R.C. Contributions may be submitted collectively by Clubs or individually by the Members concerned. Contributions will also be accepted from persons who are not members of a Club.

Please address tapes and requests for forms to: The Secretary, F.B.T.R.C., 9 Normandy Terrace, London, E.16.

NEWS FROM THE CLUBS

At the opening of the "Star" course of tape recording held on January 7th, not even bad weather could mar the good attendance of tape enthusiasts in and around Rugby. Mr. J. O. Bannister, President of the R.A.T.R.S., opened the meeting at 8 p.m. welcoming all members and non-members present. He then gave an introduction to tape recording—its history and development—telling of the progress made in tape recording from 1903. He brought along with him a 1948 'Baird' machine, together with a Wyndor Viscount. The other recorder on view was Mr. J. E. Capell's Grundig.

Amongst those present were Mr. Terry Nurse from Birmingham, and Mr. A. E. Greenway. This meeting proved most interesting and made an excellent beginning to a course which it is hoped, will help everyone attending to understand the different aspects of tape recording. The next session (January 14th) is in two parts: (a) Introduction to tape recording equipment today—Mr. J. E. Capell and (b) Care of your recorder—Mr. Mostyn Ridley.

The Birmingham Tape Recording and Audio Club are starting the new year with a new name—the word *Audio* being incorporated to encourage stereo and Hi-Fi enthusiasts to join. Mr. Dennis W. Brown (133 Pool Lane, Oldbury, Birmingham) has taken over as new secretary together with a new committee. All this "newness" bears out their news report that "a lot has taken place concerning the club's internal affairs".

Club members visited a neighbouring radio club a little while ago—the Slade Radio Society at Ardington where they enjoyed a demonstration of stereo music. The founder of the club's Hospital Service, Barry Stephens, announced "a double" recently; it was his engagement to club member Molly Rickard and her 21st birthday. Congratulations to you both.

The club received an amusing "Goon type" tape from Nottingham a couple of weeks ago—by all events it broke the grammar barrier completely.

Mr. A. C. Ings, secretary of the newly formed Clacton Tape Recording Society says that after two months they now have ten members. They meet regularly at Clacton R.A.F.A. Club in Pier Avenue. They are currently adding music and sound to a colour film taken by a member in Cornwall and Devon.



FEBRUARY NUMBER

★
Contents include Part I of a survey of American Hi-Fi. Part 3 of Stereo for Beginners. Home-Made Printed Circuits. Disc Reviews.

★
NOW ON SALE

NEWS FROM THE WORLD OF TAPE *cont.*

● Mr. Jack Payne is continuing to sponsor the products of **Tape Recorders (Electronics) Ltd.** during 1960, and the photograph right shows him signing autographs at last year's Radio Show. Amongst the "hunters", the ladies outnumber the men by five to one, and the model shown in the foreground is the Sound "Belle" Tape Recorder. The latest model from this company, the Sound "Studio", features in our New Products this month, on page 41.

The **Crawley and Sussex Tape Recording Club** are expanding a mile a minute, and at their last meeting enrolled five new members. Their "expansion" plans include publicity by press and poster. Unfortunately their most technical member and Treasurer—Mr. A. A. Runki—has to leave the club to take up a post in Germany, but he has promised to keep in touch with members and send an occasional tape. He place has been taken by Mr. F. Whittingham.

It is planned to split the club into sub-groups, to be named *recording; technical* etc., the idea being that new members, or the less technically inclined, should not be "shy" of producing their recordings. They are planning a Gala night on February 1st. An interesting item from the secretary, Mr. R. C. Watson, is that more recorders have been sold in the Crawley area in the last couple of months than either radios or televisions!

If they don't qualify for the greatest number of members, then surely **E.T.E.S.S.A.** qualify for the longest title for a club—**External Telecommunications Executive Sports and Social Association Tape Recording Club!** But with a membership approaching 100—and this without canvassing—the club must have a great deal to offer. The club has been formed for two years and as far as is known is the only club in which all members work for the same employer.

All seems to be contentment with E.T.E.S.S.A.; last year the retiring committee were re-elected en-bloc, and as there were no complaints or criticisms at meetings, the committee remains but with the addition of two further members. The General Secretary is Mr. G. P. Jones.

The **Glasgow and District Tape Recording Club** are starting a "Round Robin" tape with the London Recording Club and the West Middlesex. Members in Glasgow record greetings and messages using track 1 of a 5 inch reel. The tape is then sent to London who record on track 2, subsequently sending the tape to



West Middlesex. The latter, in turn, listen to both tracks and record their message on track 1, erasing Glasgow. The reel is posted to Glasgow to complete the cycle. The exchanges are organised by Mr. W. Patrick Copinger who is vice president and founder of the West Middlesex Club and an Honorary Member of the London Club. He is also a member of the Glasgow Club where he edits the tape magazine.

Several members of the **Nottingham Co-operative Amateur Tape Recording Society** have expressed the desire to know "more about the works", so they have arranged a series of informed discussions which will give everyone a chance to learn from the more experienced members. The suggested subjects for discussion are (1) Magnetic recording (2) Tape transport mechanisms (3) Recording techniques (4) Microphones and loudspeakers (5)

Seen here making a test recording are a few members of the **Jarrow and District Tape Recording Society**. They are (left to right) Bob Canham, John Rippington (Secretary), Malcolm Brown and George Blakey.

The equipment being used comprises two **Ferrographs**—a 2A and 2AN (owned by Mr. Rippington), a **Vortexion** four channel mixer and a **Reslo** microphone. But this is only a small part of the equipment owned by members, for at a recent sports meeting they gave a tape demonstration using £1,500 worth of equipment.



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G & G

CLUB NOTES and NEWS (continued)

Microphone technique (6) Mixers and preamplifiers (7) Studio technique (8) Tape recorder electronics (9) Editing, dubbing and splicing (10) Complete tape recorders. Meetings are now held on alternate Thursdays; the above series commenced on January 7th.



Grundig Ltd., are in the news again—this time with the help of the redoubtable Mr. Norman Wisdom. In his latest comedy for Rank —“Follow a Star”, both a Grundig TK30 and TM20 deck are prominently featured. The film, which got off to a flying start at the New Victoria Cinema. When on general release, a competition was run in the London and Greater London areas for which the prize was a TK30.

Mr. Mick J. Witt very kindly sent us a copy of “Monitor”, the Official Journal of the I.S.W.L. Our great interest was, of course in the Tape Section formed six months ago. Membership is steadily increasing both in the U.K. and abroad. In this country four “round robins” are circulating and a news tape has proved to be very successful. It is hoped that a news tape will be produced monthly from now on to all members.

They are planning a DX contest soon and all identifications will be put on tape. The contestant with the highest number of countries will be declared the winner. They have also started a morse service; anyone who possesses a tape recorder and would like to join this section should write to **Mick J. Witt, 12 Bruce Avenue, Shepperton, Middlesex.**

The **Rugby Amateur Tape Recording Society** have sent us an interesting bulletin entitled, “*Mayor Takes to Tape Recording*”. The mayor of Rugby, Councillor P. A. Batt, this year adopted a method never before attempted by his predecessors, by recording his impressions of his mayoral tour on Christmas day on tape. After an exhaustive tour of local hospitals and homes for children, he said surprise visits to the fire station and ambulance depots. He returned home to record the details of the tour,

afterwards passing the tape to his secretary who made dubbings for the press.

New Recording Studios

THE City of London Recording Studios, at 9-13 Osborn House, Osborn Street, Aldgate, E.C.1., have now been completed, and are claimed to be the most modern and up to date in the British Isles.

Designed and built exclusively for recording purposes, these studios offer a high standard in both equipment and comfort. Behind this venture is Mr. Bryan Dempster, on whose life the film “The Naked Earth” was based, and whose recordings in Africa are now well-known. The Recording Manager is Mr. Bernard Mattimore.

Agfa Jointing Tape

WE have begun to receive a daily crop of letters from readers who have bought the booklet *How to Splice Tape* and who are anxious to try out the narrow gauge jointing tape that is illustrated in its pages. This tape is made by Agfa Ltd. It is ¼ in. wide. Its price is 5s. 6d. for a roll of 80 ft. The mathematically minded will already have calculated the cost of nearly 1,000 joints!

Until recently, Agfa jointing tape was only available for professional use; but it is now being distributed to shops in the U.K. If any difficulty is experienced in obtaining supplies, please write direct to **Agfa Ltd., 27 Regent Street, London, S.W.1.**, who will tell you your nearest stockist.

OUR SPECIAL BIRTHDAY OFFER!

★ This February number of *The Tape Recorder* opens our second volume—Vol. 2 No. 1. And to mark the occasion we offer all new subscribers a token birthday present—a free copy of our useful booklet:

“HOW TO SPLICE TAPE”

The annual subscription rate for *The Tape Recorder* is 21/-, posted to any address in the world (U.S.A. \$3.00), or 24/- including the annual index (U.S.A. \$3.25).

Our subscription service guarantees readers a regular monthly posting on the day of publication, and ensures supplies in areas where copies are hard to obtain. Any copies lost in transit are replaced at our expense. If you wish your name to be added to our monthly mailing list, write today enclosing your cheque, postal order or money order.

All new applications received by February 29th, 1960—or from overseas by March 31st—will automatically entitle the subscriber to a free copy of our 2/- booklet, and this will be posted immediately upon receipt of the subscription order.

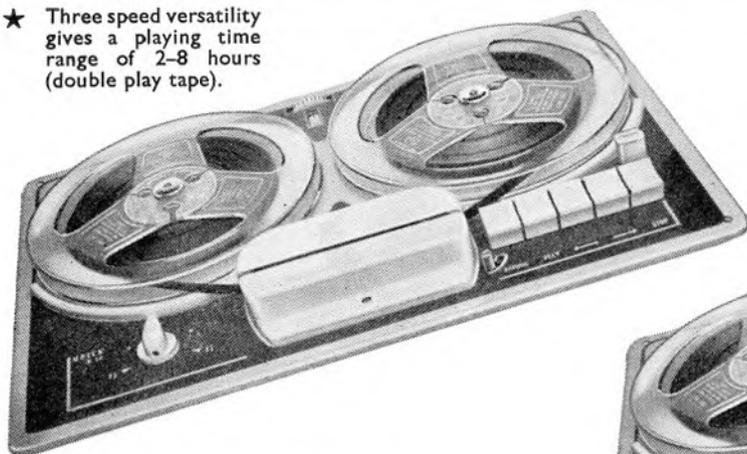
Remember, this offer extends only to the dates specified. Simply clip the token, and pin it to the letter enclosing your remittance. State the month with which the subscription is to begin, and please write the full name and address in **BLOCK LETTERS**, exactly as you wish your monthly wrappers to be addressed, because our stencil plates—and our regular service to you—depend upon this initial accuracy.

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THE TAPE RECORDER
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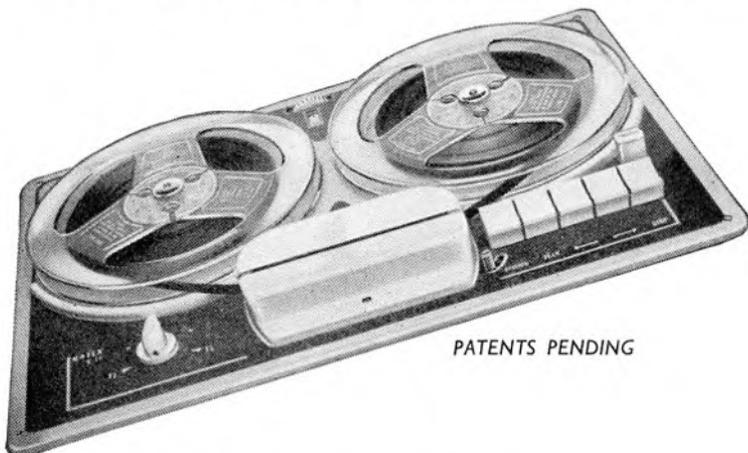
- ★ Improved record/playback head gives frequency response from 40 c/s-12,000 c/s at 7.5 i.p.s.
Precision balanced flywheel and capstan assembly reduces wow to a minimum.



- ★ Motek's new K10 tape deck incorporates many outstanding features. Three speeds, pause control, push button operation, accidental erasure prevention, accurate positioning counter.

21 GNS

the NEW **MOTEK** **K10** 3 SPEED TAPE DECK



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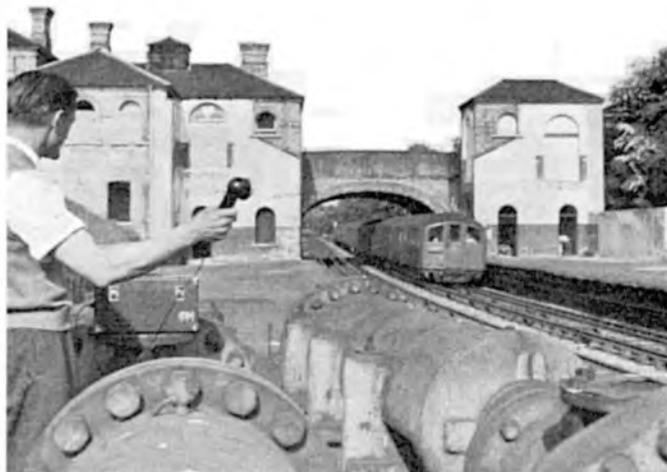
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BUILDING A SOUND EFFECTS LIBRARY

PART 4 — RAILWAY SOUNDS



Pipe in mouth, B. R. Read adds an electric train to his library.

NEARLY every man has, at sometime in his life, wanted to be a train driver. Whether the boys of today feel the same urge to drive the new diesel engines or not, I don't know, but it would seem that interest in railways is still very much alive, judging by the numbers of boys seen wherever trains pass or gather, and the many news items in the press of amateur railway societies' efforts to preserve branch lines and old rolling stock. From my own experience, recordings of trains, especially expresses passing at speed, are of fascinating interest even to people who don't normally take much notice of these things. The powerful majestic sound of their approach and their loud friendly chatter as they pass, although always of wonderful interest, never frightens as, for example, a jet aeroplane does. So much so that I would say that their human qualities are only rivalled by old motor cars and paddle boats!

The biggest problem in making railway recordings is the selection of what to record from the tremendous variety and scope available. Very careful planning is needed in order to contain a library of railway recordings within reasonable limits, and quite a lot of self control must be exercised not to record any and every train that passes. With such an interesting and historic subject to work on, it is difficult to know where to begin, but let us make a start on the fast express trains.

Venue and Method

There are many places adjacent to or on public property giving access to main lines without trespassing on railway property. Road bridges over rail tracks, quiet roads running alongside them, etc., can all be used, but care must be taken not to trespass or endanger yourself or others by positioning yourself and equipment precariously on bridges or at the top of railway cuttings. Trains are not shy in letting themselves be heard, so there is no need to get too close, in fact it's a disadvantage. I rather feel that, as with aeroplanes, probably the best thing for an amateur to do is get to know someone whose garden or ground backs on to a train line. Better still, get to know several people so that you have a choice of locations.

My own preference of location for recording trains passing is the top of a cutting on a still day, out in the country away from all road traffic and other extraneous sounds. Recordings made in these conditions are as real and as near stereophonic in effect as monophonic recordings are ever likely to be, and there are many private locations where these conditions prevail. Town dwellers need not despair, however, as I have made many successful recordings from back gardens as near London as Caling for Western Region, and Wimbledon for Southern Region.

At these places, there are many locals and goods trains thrown in for good measure! Levels have to be watched and manipulated very carefully as, especially with expresses, the build up of sound is extremely rapid. So also is the die away, and it is often a good thing to bring up the level of the receding train so that its disappearance is not too abrupt. Likewise with the approach. Set the gain control fairly high and gradually reduce it so that the build up of the approach doesn't come with the crash impact of pre-set level recordings. It's uncanny how little noise express

trains make on their approach. They are on top of you so quickly, that it's an overwhelming argument against trespassing.

If you can get to a really quiet place for your recordings, you'll probably find that you'll be able to position yourself near a signal. If so, keep your machine running and record the signal being raised after the train has passed. It's a nice reassuring sound. Quite a lot of patience and working out from time-tables will be required, though, to record the signal being lowered without using a lot of tape. By planning beforehand, you will probably find you can choose a stretch of track where locals and goods trains pass as well as expresses, but do make a careful note of each and every type of train you record, and the type, class, and wheel formation of each engine. There can be no doubts or arguments then at subsequent playbacks!

Quaint or rare railways

When out and about, always keep an eye, and ear, open for the unusual, quaint or rare in railways. For example, at Bourne End, near Maidenhead, an old tank engine fussily shuttles back and forth all day, during the summer anyway, blowing its whistle every time it rattles over a pedestrian level crossing. It pulls, or pushes, only one coach, and some gem period recordings can be made during a picnic at this lovely spot.

A similar train, with rather more coaches, but pulled by an equally old engine, runs between Havant and Hayling Island, and I've heard of many others up and down the country. This is the type of train that is rapidly disappearing and although many people and societies are making recordings of them, it's very satisfying to capture a good recording of your own. I would suggest that you also take your camera on these expeditions. Photographs of the trains you record will help you in identifying any you are not sure of.

The shunting of trucks is always a good noise to record, and usually quite an easy one. Goods yards and marshalling yards seem usually to be built in the middle of a housing estate, so access should present no difficulty, but the busiest and most impressive time always seems to be after midnight. You ask the local residents! There are no real balance snags here. Levels are inclined to be high and unexpected, if you happen to get too close to the activities. Therefore it is well worth waiting and taking a number of recordings to come away at last with a recording of the clink, clank, clank, clank from one end of a line of goods wagons to the other. Most big yards these days have diesel shunters, but you may be lucky enough to find an old "puffer" at work.

Moving Inwards

For the rest of the railway recordings, it is very difficult for the amateur to go very much further. Recordings on railway stations or on railway property require special permission which I should imagine would not be forthcoming. The railway's liability to its passengers would prevent them giving permission

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LP. 133

SOUND EFFECTS—(continued)

to amateur recordists to go wandering over their stations and other properties with electrical apparatus and wires.

Whenever I do recordings on railway property, the railways always send a representative with me to make sure I don't get myself or anyone else into trouble or danger. As it would be impossible to treat amateur recordists likewise, I would suggest that copies of recordings of this type be obtained from the recording studios who specialise in this type of recording. They often advertise in the magazines dealing with railways, or no doubt your nearest Amateur Railway Society will be very pleased to help you.

Level crossings

One recording you should be able to make, though, without much difficulty, is of the activity at a level crossing. The gates clanging shut, traffic coming to a halt, the train lumbering across the crossing, followed by the car and lorry engines starting up as the gates crash open; it all adds up to a nice sound picture.

Those of you who live in or near London shouldn't neglect to get some recordings of the Underground trains. The Piccadilly type and Metropolitan or District Line type are quite distinctive and would make a useful addition to any library. Back gardens abound on these lines where they run in the open, and they are so easy to record. Cuttings are again my preference, especially those right in town deep between high buildings. As this is one of the familiar sounds that Londoners who have emigrated miss so much, it might be an idea to make up a tape of this and other nostalgic sounds to send to friends or relatives in distant parts of the world.

The recording of Tube trains underground presents the same problems for the amateur as on other railways, only more so, with the Underground Stations' much more restricted space and relatively denser passenger traffic. However, very adequate station recordings may be obtained from the bottom of someone's garden adjoining a London Transport Station. Similar procedures would also apply, of course, to Southern, Midland and Eastern Region electric trains. Those Eastern Region electric trains with the overhead wire system are quite distinctive, and should find a place in any serious Railway Sound Library. If you record this type of train you might, when playing them back, deceive your audience into thinking that they are Swiss trains recorded during your last holiday there!

A few odds and ends

Generally speaking (unfortunately from many points of view), the recordings that are of most use, and most used, in a Sound Effects Library, are the least spectacular, the "bread and butter" recordings. These are the ones that earn their keep many times over, and most of them are easy to record and tailor made for these long winter evenings when extraneous sounds are probably at their lowest. So let us consider some, at random.

An easy sound picture which can be very useful and amusing is a recording of the front gate opening and closing, footsteps up the path, key inserted in lock, and door opened and closed. By separately recording the knocker and/or bell, doing a postman's knock, charity collector's knock, and a bailiff's knock, you are then prepared for most needs on this theme. A colleague and I made a similar recording some time ago, but he nearly spoilt it by giving a long drawn out slurping kiss to the back of his hand after opening the door!

Once indoors, a cup of tea is a usual thing, and setting cup and spoon on saucer is a nice homely sound, but make sure neither cup nor saucer are cracked, the surroundings are dead quiet, and don't get the microphone too near. About 18 in. away is a good general distance. Then put the kettle on. If it's an electric one, your recording should be of filling it up, putting the lid on, and switching on. There will then be nothing more to record until boiling time. If it's a gas kettle, again you can record the filling up, putting on the lid, placing the kettle on the stove, lighting the gas, and then wait until it boils to record again.

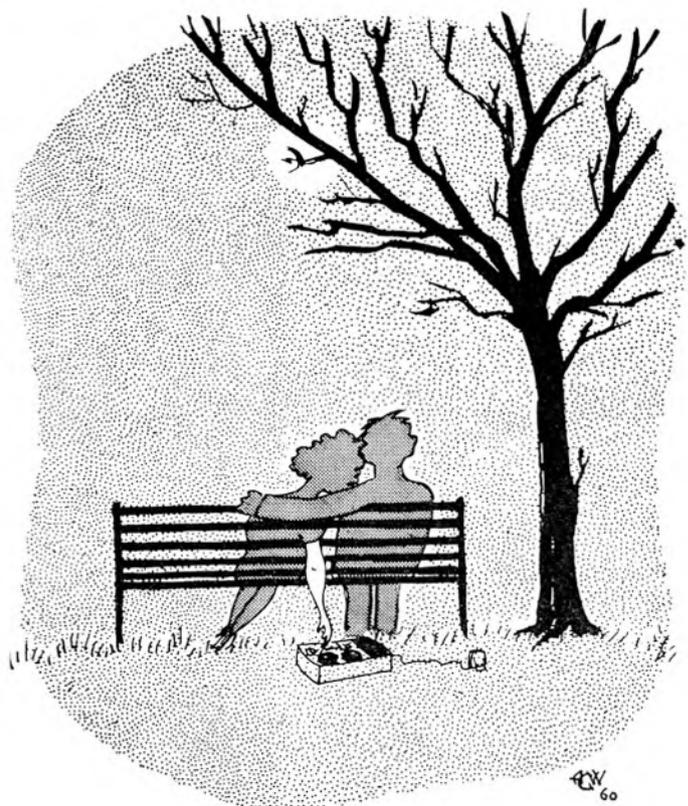
The making of the tea you can try if you wish, but you'll probably find that the low levels involved make it hardly worth

while. Whilst you are at the stove, though, bubbling porridge or a pudding being boiled make a good noise, as do chips being placed in the pan. And bacon frying; there's a versatile sound for you. Play around with the speed and you have a forest fire, volcanic lava, Martian death-ray guns and a host of other things. Washing up is another sound that should be included. The recording should, of course, include everything from the filling of the bowl or sink to the final gurgling emptying of the water down the drain.

Deserving a sit down after all that effort, do you have, by any chance, an old sprung chair or bed? A recording of the squeaks, grunts and "ploings" should be made if you have such a thing. It will be most useful. Exaggerated "ploings" can be made by flexing a thin bladed knife or a hacksaw blade over the edge of a wooden table or when held tightly in a vice. Now, before you finally settle yourself, perhaps the fire needs making up. For this I suggest a sequence of recordings starting with picking up the coal bucket, opening the back door, then opening the coal bunker door, shovelling coal into the bucket, closing the doors and finishing the recording with a shovel full or two of coal being put on the fire and the consequent spluttering and crackling of the new fuel.

To correspondents abroad

A recorded sequence such as just suggested, with or without commentary, exaggerated or played straight, might be just the sort of nostalgic recording to send to relatives living abroad. The kind of half-forgotten sounds that bring memories flooding back are so often those that we who are left take for granted, and, incorporated in a tape of spoken messages, they can add so much more interest and humour to a recording. Perhaps it might be a back door where the bolt rattles when it is opened, or a noisy gas jet turned out or again an old faithful alarm clock doing its duty. All these sounds will be of use to your own library anyway. And then, of course, the possibility to consider here is that the people abroad receiving your tape may well be in a position to make some recordings of typical sounds of their new country and send them to you.



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Angus McKenzie in TAPE RECORDING AND HI-FI MAGAZINE



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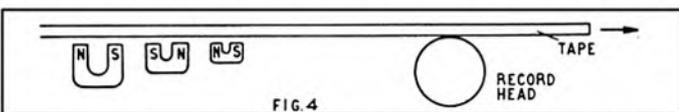
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tion appears to be weak or intermittent, the base feed condenser C_2 may be increased in value to about 500 pf, but this will usually overdrive the transistor to give waveform distortion, which will increase the recorded background noise. If all else fails it may be as well to rewind the oscillator coil, as a shorted turn may have developed during assembly. Also check that the winding continues in the same direction after leading out the tap loop. If the winding direction is let us say clockwise up to the tap, and anti-clockwise for the remainder of the Coil it will not oscillate.

Experiment 18. Recording with HF bias

Record a short length of tape with DC bias, using the 4.5 volt battery, and then substitute the circuit described above, first using the 4.5 volt battery to power the oscillator, and then altering the voltage from 4 to 6 volts by using an extra 1.5 volt cell as in the first DC bias tests. At 3v HT, the bias voltage will be approximately 7v, at 4.5v approximately 10v, and at 6v about 15v. The recording head coils should be connected in parallel.

Re-connect for playback, and listen carefully to these recordings. It should be found that the distortion and background noise are markedly reduced, and that a higher level can be recorded on the tape without audible distortion. As the bias is lowered the high



note response is improved, but the distortion will be a little higher. Too high a bias will cut the high note response, but the distortion and noise will be very low. It may be necessary to increase the oscillator HT voltage to 9 volts, to overbias the tape, but a wide range of voltages should be tried to make sure that optimum bias is available. The bias sensitivity of different tapes, and even individual recording heads, may vary over a range of almost two to one. It will be found that a low bias is preferable at low tape speeds, as the high note response is better maintained even at the expense of a slightly higher distortion and noise level. It will also be found that a low bias exaggerates tape defects which give rise to what are known as "drop outs"; small instantaneous variations in recorded level which show up as a roughness or unevenness on a sustained note.

Experiment 19. Erasing for HF bias

New virgin tape, straight from the maker's carton, will give the lowest background noise, and recorded tape which has been "bulk erased" should be equally quiet. A home-made bulk eraser was described by Mr. R. W. Panting in November *Readers' Letters*, and there are several bulk erasers on the market.

If recorded tape is erased with a permanent magnet, as for the DC bias experiments, the noise increases slightly as a small magnetisation is left on the tape which the HF bias cannot completely cancel. It will however be found that most of the "hiss" disappears when HF bias is used, leaving only a slight low pitched "rumble" background noise.

You might like to experiment with a multi-magnet erase system, where the tape is first saturated to eliminate any previous recording, and then passed over a series of magnets of diminishing strength, and alternately reversed polarity, so that the tape leaves the erase system with negligible magnetisation. Fig. 4.

If you own a commercial tape recorder, the tape may be erased by setting the machine to "record", and turning the volume control to zero, so that no signal is impressed on the tape. Most full sized recorders use an HF erase head, which electrically is rather like a record head with a wide gap. This head is fed from a powerful HF oscillator, which takes the tape oxide to saturation many times a second. Then, as each particle of oxide leaves the gap, it is subjected to a slowly decreasing alternating field, which reduces the residual magnetisation to zero so that the tape is perfectly clean and quiet. With nickle iron erase heads, the power required to erase a tape completely is several watts, but recent advances in low loss ferrite materials for the erase head core reduce the power requirements very considerably, and make a simple transistor-powered erase circuit a practical possibility.

COMPETITION RESULT

IN order to bring new readers into the picture, the idea behind our "New Music" competition was to break away from the more common ground, and to encourage owners of tape recorders to experiment with the "creation of sound patterns". In order to keep experiment and imagination within reasonable bounds, we specified five different subjects: (1) Interval Signal for a broadcasting station, (2) Sound Track for Film or TV, advertising Holiday Camps or Foreign Travel, (3) Theme Music, for use in part (or parts) of an "A" certificate Science Fiction Film, (4) Advertisement Sound Track, for a new detergent, for use on film or TV, (5) A Composition, to be listened to for its own sake, and not as an accompaniment.

As might have been expected, the entries in Class B (employing two machines or more) attained a higher technical standard than those in Class A, and it was decided to award 4 prizes in Class B and 2 in Class A. Quite a number of entries (particularly for subject 5) showed that the rules had not been studied. Some ran too long, some used copyright material, and we even received a Harmonica Solo!

The judges were, as previously announced, Tristran Cary, Eric Tomlinson, Desmond Briscoe, Daphne Oram, and John Borwick. Occasionally an entry made a count of votes necessary, but for the most part the panel were unanimous in their selections. On one important point they were certainly in complete agreement viz. that entries from semi-professional tape enthusiasts, or those who had access to professional equipment, were at a distinct advantage compared with the average user of a single domestic recorder. Of course this arose from the terms of the competition—"anyone can enter"—but amateurs should not feel "elbowed out" of things on this account.

RESULTS

Class A: First Prize. A H.M.V. Tape Recorder, Model DSR1, complete with microphone and 1,200 ft. of Emitape—N. Rees, 25 College Road North, Blundellsands, Liverpool, 23.

Second Prize. A Grampian DP/4 microphone—J. W. Williams, 10 Nab Wood Road, Shipley, Yorkshire.

Class B: First Prize. A Fi-Cord battery-operated portable recorder, including tape, batteries, microphone and battery charger—F. C. Judd, 152 Maybank Road, South Woodford, London, E.18.

Second Prize. A Brenell Mark V Tape Deck—J. S. Harper, 82 Shaftesbury Avenue, London, W.1.

Third Prize. A Lustraphone Transistorised Mixer—Stuart Wynn Jones, 107 Fellows Road, London, N.W.3.

Fourth Prize. A Simon "Cadenza" ribbon microphone.
Consolation Prizes in both classes, each of one 1,200 ft. spool of M.S.S. recording tape, were awarded to all competitors who were judged to have produced "a good effort." In addition, free subscriptions to *The Tape Recorder*, and copies of "How to Splice Tape" were awarded to all entrants whose entries conformed to the rules of the competition.

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FIELD TRIALS OF PORTABLES

No. 4 THE STEELMAN "TRANSITAPE"

MORE and more people are coming to realise the advantages of a battery-operated recorder for outdoor and actuality recording. It is the aim of these Field Trials to test the handiness and ease of operation of the machines, under typical operating conditions. A full-scale technical review is felt to be of less importance, since these small recorders do not usually claim the same performance as their larger mains counterparts. The above photograph shows *The Tape Recorder's* Jean Clark recording the comments (and splashes) of a Royal Navy diver during a demonstration at the National Boat Show.

requirement is that a high source impedance be presented to suit the recorder input, which is rated at 100,000 ohms.

Playback through external amplifier

The "Transitape" has an output socket, however, rated at 3.2 ohms, which will enable tapes to be replayed through an external loudspeaker or amplifier, etc. Plugging into this socket automatically cuts the internal loudspeaker. The lapel microphone may be inserted for private listening, and held to the ear, or a pair of headphones may be employed. As might be expected in an overseas machine, the plugs and sockets are non-standard, but it may be that this will be put right on British versions.

Since this particular field trial coincided with the Festive Season, the "Transitape" was used at a number of family parties, and several friends heard their own recorded voices for the first time. As always on these occasions, although no one had any difficulty in recognising everyone else's voice, they could not identify themselves. This gave us the idea for a party game, and each person took the "Transitape" away and made a recording impersonating someone else. We then had to guess not only who was speaking but *who they were attempting to mimic*.

It was obvious that no one had any difficulty in learning to operate the "Transitape", and its controls must surely be as simple as those of any recorder available. There are four controls, as follows:—(1) Volume/gain control knob. Not incorporating a switch, this may be preset and left in position; (2) fast rewind/wind forward/off lever; (3) $1\frac{1}{2}/3\frac{1}{2}$ i/s speed selector lever; (4) Playback/Record/Off knob. Turning this away from the off position gives immediate playback. To record, it is necessary to press down an interlock button alongside the knob, so accidental erasure is guarded against.

Level indicator

On top of the machine is a neon lamp Level Indicator. When the recording gain knob is set correctly, this lamp glows at medium brightness on loud peaks of programme. In practice, this indicator was found to be relatively difficult to read with any accuracy, but of course for note-taking, and other business recordings, the distortion which might accompany overloading would not matter very much. It would therefore be enough to see that the neon lit fairly frequently to achieve satisfactory results.

A second neon lamp is situated on the front of the recorder, whose function is to indicate when the motor batteries require to be replaced. The "Transitape" employs a total of 13 small

FIRST of the Steelman Phonograph and Radio Company's products to be available in this country, the "Transitape" is a battery operated portable with a number of novel features. It was first shown at the Northern Audio Fair, its appearance alone being enough to make Old World tape addicts sit up and take notice. Even the expanded metal loudspeaker grille, and the foil-sprayed plastic knobs have a decidedly Transatlantic expensive look, and the real leather case is edged in gold braid, and specially shaped and cut out to allow immediate access to all controls. There are observation windows too, so that the Level Indicator and spools can be watched during recording with the detachable flap fastened in position. This flap is punched with a series of holes, so that you can record while the microphone is still housed in its foam rubber compartment.

Microphone used in holder

A number of recordings were made with this "no microphone" arrangement—which would surely be unique except for the new Simon Minstrelle which has a built-in microphone—and the convenience was found to be terrific, either using the shoulder strap or the short carrying handle. Naturally the mechanical noise of the motor was audible on these recordings, but not at such a serious level as to affect intelligibility. Oddly enough, it did not affect results very much if the microphone was stored face downwards!

The microphone is a crystal type and carries a clip for easy fastening to one's lapel, etc. The lead is just over 2 ft. in length, which shows the designer's pre-occupation with the lapel method of recording. And, after all, for business men, and interviewers of all kinds, this will be the "Transitape's" main function. If a longer lead were supplied it would most likely get tangled up. In keeping with this, there is no auxiliary input socket for radio, or record-player, etc., though the microphone socket will cope with these. Of course, other types of microphone may be used, and there is a 10 ft. extension lead available. The only

FIELD TRIALS OF PORTABLES

No. 4 THE STEELMAN "TRANSITAPE" cont.



batteries. Six of these supply the amplifier, and have an operating life of approximately 300 hours. The remaining seven batteries operate the motor, and will last for about 50 hours. For fast wind and rewind, the motor voltage is doubled. The winding time was found to be 40 seconds and 90 seconds for rewind and wind-on respectively, with the standard tape supplied.

Tape footage scale

There is a tape footage scale engraved on the deck, so that you can tell at a glance approximately how much tape there is still available. This facility is supplied on a number of mains recorders, such as the Brenell, but in view of the various thicknesses of tape now in use, the "Transitape's" scale is marked in percentage of playing time only. Several interesting auxiliary features may be added to this machine, which help to make it perhaps the most versatile so far tested. For example, there are two types of remote control switch, each supplied with 6 ft. of cable, a push-to-talk hand switch with a slide lock, and a push-on-push-off floor switch. The latter, plus a pair of headphones, would be extremely useful in transcribing letters or reports on to a typewriter. There is provision too for alternative power supplies, should these be required. Any external 12 volt

battery may be used, or a mains adaptor is available to run the recorder from 220 or 110 volt AC mains.

Tape Footage and Time Chart

Type of Tape	Tape Length in feet	Playing Time in Minutes			
		Single Track 1½ i/s 3½ i/s		Two Tracks 1½ i/s 3½ i/s	
Standard ...	150	16	8	32	16
Extra Play ...	225	24	12	48	24
Double Play ...	300	32	16	64	32

The "Commercial"

But I cannot end without mentioning the "commercial" which I found recorded on the tape, when first trying out this machine. I expect most people switch to "Playback" when first receiving a tape, to see if anything has been recorded previously. In the case of tapes on newly acquired tape recorders, the signal, only too often, consists of a shop assistant's hesitant attempts to demonstrate the tape machine, with, sometimes, a customer's reactions.

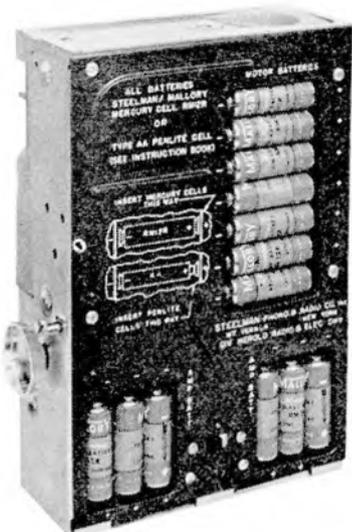
Not so with this American machine. On switching on, I was entertained by a three or four minute "commercial" pointing out the Steelman's many virtues. This recording was so well produced, with fanfares, a male voice quartet singing "Nelly Dean" —("take your 'Transitape' to a party"), dramatised interviews and "on location" note-taking, that you would never dream of erasing it. I must have played it over to dozens of people already, and although the machine under review is presumably an all-American sample, I hope the British-assembled versions (by Messrs. Redifon Ltd., of Wandsworth) will retain this entertaining—and surely money-spinning—feature.

Technical Specification

Battery complement: 13 × Mallory RM12R. **Operating life:** Seven motor batteries; 50 hours; six amplifier batteries; 300 hours. **Transistors:** 7 × RCA 405 or equivalent. **Level Indicator:** Neon lamp. **Playing time:** 16 minutes per track at 1½ i/s, standard tape. **Spool size:** 3 in. **Recording sense:** Standard: top track, left to right. **Tape speed:** 1½ and 3½ i/s. **Frequency response:** 150-7,500 c/s. **Output:** for 3 ohm extension speaker. **Input impedance:** 100,000 ohms. **Overall gain:** 55dB. **Weight:** 6½ lb. less batteries. **Dimensions:** 9¼ × 6½ × 2¾ in. **Price:** £57 15s.

Manufactured by Steelman Phonograph and Radio Company. U.K. agents: **Teletronics Limited, 46/47 Frith Street, London, W.1.**

Removing the leather case (right) exposes the battery compartment, in which engraved instructions simplify the operation of replacing batteries. Although the operating life of the motor batteries is quoted as 50 hours, experience shows that 70 to 80 hours is often achieved. The top view (top of page) shows the moulded foam rubber microphone housing, and the neon level indicator.



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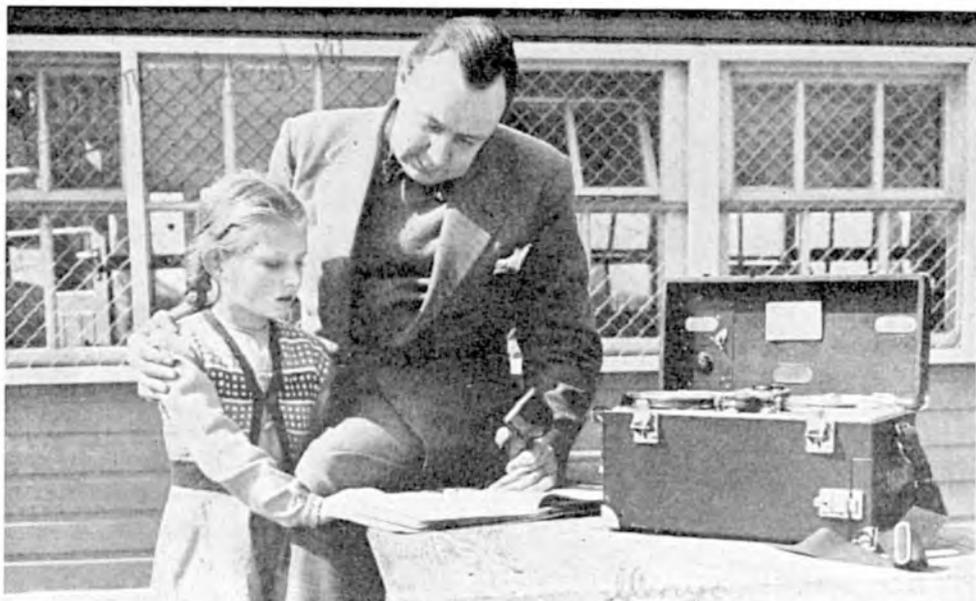
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THE RECORDED PRODUCTION WAS BY YOU

PART ONE—

FINDING A PLAY AND CHOOSING A CAST

By STEPHEN GRENFELL



● As perhaps in no other medium, the amateur producer of tape programmes—drama or documentary—can draw on an unlimited professional example in the daily output of the BBC. Stephen Grenfell, shown above checking the “Radio Times” of that other BBC, the Barnham Broadcasting Corporation, with its Editor, Glynis Williams, has written and acted in a great many plays, in addition to putting on some of the best documentary programmes ever broadcast. Readers who enjoyed his “*The Interviewer Was . . . You*” feature in March, will welcome his helpful suggestions on the role of producer in this and subsequent articles.

* * *

THE more I travel around Britain—and I manage to cover a good many thousand miles every year—the more I become convinced that every second man, woman and child in the kingdom nurtures a deep and irrepressible desire to be an actor; or, if that is not possible, to be a writer. That, in these days when an ordinary, every day human being—with a gimmick he may not even be conscious of possessing—can become a television personality literally overnight, is the correct order of priority. Most radio listeners, as I have learned over the years, seem irrevocably wedded to the belief that actors and actresses make up the play at the microphone as they go along. Writers, to the listener, are small fry in the scheme of things. It's the man with the voice at the mike who counts.

The producer, vitally important though he is in a radio production, apparently counts for even less. A good producer does his job efficiently and unobtrusively; his name appears in very small print way down in the billing and few listeners apparently realise that he exists.

Producer's job is fascinating

Yet in a studio production the producer's job is probably the most fascinating of the lot. He has to put over, in words, music and sound effects, exactly what was in the writer's mind when he committed his idea to paper. The producer has to take the original script and time it with a stop-watch—playing all the parts himself and doing the sound effects—to see that its length bears some relation to the length he is aiming at. He will probably find in the script things that he feels want changing: lines of dialogue which can and must have more punch; scenes that add nothing to the story or the dramatic tension and which can well be cut; other scenes that must be added or rewritten to give the story its full dramatic value.

All these things the producer must discuss with the author so that he, the producer, can begin his production with the best possible script. Then he must decide on the players he is going to cast in the various roles; he must arrange the sound effects that are necessary to tell the story of the play or feature programme; he must choose the music he is going to use to give the dialogue a greater impact; he must arrange for a place to rehearse; and then he must rehearse and

direct his cast until he is satisfied that they are ready to record the programme or transmit it “live”.

By any standards it's a tough and challenging job; and even in a TV-mad world a good radio producer is still a king-pin and worth more, probably, than he gets in hard cash. “Saturday Night Theatre” —on the Home Service of the BBC—can easily pull in a listening audience of two-and-a-half to three million and it's likely that a repeat broadcast the following week will gain another two million listeners

A home-radio producer

If you happen to possess a tape-recorder, and plenty of enthusiasm, you too can, if you so wish, become a radio producer; and it's my guess that you'll find it a fascinating and rewarding hobby. Of course you won't be getting audiences of millions like the BBC or Radio Luxemburg, but even if you can turn round at the end of a production and wipe the sweat off your brow in front of two dozen satisfied customers you will have made a good start.

To make this good start as a home-radio-producer you mustn't begin by biting off more than you can chew. As you can't call on the facilities of a superbly equipped BBC studio there's not much future in choosing for your first effort an air-sea rescue epic, shall we say, that requires a cast of thirty, half-a-dozen microphones, distort devices and echo chambers, and dozens of special effects of modern aircraft at various stages of flight, lifeboats at sea, helicopters hovering above the ocean, and inflatable dinghies riding the waves.

You, as a newly-fledged producer of recorded programmes, will probably have only one microphone at your disposal. So you will have to cut your dramatic suit according to your radio cloth.

To mix a metaphor or two you would be wise to cut your teeth on a short, uncomplicated production which does not call for more than half-a-dozen actors, and which does not need the complete co-operation of the BBC effects department to put it over.

Let us assume that you have decided to open up your career as a producer with a thirty-minute programme.

You need a script

To start with you need a script. Well, you can hire one, borrow one or write one yourself. It may be that for years you have carried around in your head the plot of a play that you are determined to commit to paper. All right; go ahead and write it. If you want my advice I would suggest that you don't write a play which is set in a particular “heavily-accented” region—an American gang-war story or a drama about a love nest in Bradford. Nor do you want to attempt a play that bristles with Highland Scots, Welsh, County Down, Durham, Devonian and Southern Irish accents. Nothing sticks out of a production so much as badly executed regional accents, and amateurs, though they are anxious to attempt them, don't usually sound

(Continued on page 31.)

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THE RECORDED PRODUCTION—(continued)

over-confident when they are trying to put lines across in anything from Lower Brooklyn to Upper Manchester Ship Canal.

There is also the question of the idiom in which you are writing. Write about the sort of people you know and meet in your everyday life. Put into their mouths the words they use in their ordinary speech, allowing yourself a little dramatic licence of course; and choose a theme and a setting that you know something about: the best playwrights write about things and people that they know; and unless you're a budding Bernard Shaw or an embryo J. B. Priestly it would be well if you copied the example of dramatists who have come up the hard way.

If you don't happen to have a play of your own you can always borrow a script or hire one. If you hear a short play which the BBC Drama Department broadcasts during one of its matinee spots, and you think it is something you and your team could handle, write to the author concerned. If it is an original play he will, in nine cases out of ten, own the copyright. And by law you may not use his work without his permission. In your letter explain clearly what you wish to do; that yours is an amateur organisation; that you do not intend to broadcast the play to a large audience, but to a small, non-paying audience consisting of the members of your group and their friends. Give an estimate of the number of times you intend to broadcast the recording you propose to make.

Ask the author

The author may charge you a few guineas for the permission to use his script; and he has every right to because a writer's scripts and ideas are his capital; but I have a feeling that most radio playwrights you approach will meet you more than half-way when they understand you are amateurs. Certainly I have never charged any amateur group a penny for the use of any of my radio scripts. It is just as well to remember, too, that most authors are vain to some extent; and a letter from you—asking for the use of a dramatist's play—which forgets to mention how moved, thrilled, delighted or overwhelmed you and your group were when you listened to the play might not be received with the interest you want to create.

Well, you now have a play: on with the show. The first problem you have to face is casting. This isn't as easy as it sounds, but it will be a lot easier if *you*, and you alone, do the casting. Amateur actors and actresses are very human, and sometimes just a little self-centred and intense; and your team will probably have very definite ideas on the parts they want to play. You have got to be firm, without being a petty tyrant. With your most charming and most determined smile, allocate the various roles to the people who, in your opinion, are best suited to play them. Don't let your heart rule your head. Angela might be the most adorable young woman in the world as far as you personally are concerned. You want to marry her as soon as possible. This, however, does not mean that she will of necessity be any great shakes as Lady Macbeth. Steel your heart, look Angela straight in her beautiful face, and tell her that she is going to have no more than "a spit and a cough" as Lady Agatha's personal maid; and that if she handles this assignment successfully you will give her more to do in your next epic.

Let the cast have their heads

As you are having to handle amateurs don't try them too hard. If a particular part calls for a hoarse, gravelly, sixty-year-old taxi-driver's voice don't give it to the youngest angry young man in your cast. Give it to one of your middle-aged or elderly male members; and let the angry young man tackle the role of the angry young man; he's going to feel a lot happier that way.

Welcome suggestions from your cast, but avoid letting their enthusiasm get the better of them. You'll never get very far if every



Stephen Grenfell is seen recording in Ghent, outside a café which was previously a gallows. This assignment was one of a number of recordings he made for the BBC's programme "Holiday Hour."

time a young actress has to say: "Dinner is served, my lord," she hurls her script into the fireplace, looks at you soulfully and intones those famous last words: "But, *dahling*, it just isn't me! It really isn't!"

So let your cast have their heads within reason, as long as you keep a tight rein on them and don't let them take over completely. No amateur production is ever such a shambles as the one in which the entire cast is determinedly doing the production, while the harassed producer sits huddled in his chair and does no more than miserably time the proceedings with a stop-watch.

Now all these pieces of advice might sound gratuitous and self-evident to you; but I have acted as midwife to enough amateur productions to feel that they need to be offered.

Typing extra scripts

Well, as I said, you have got yourself a script: and that is exactly what you have got—one script. As your cast of six or seven can't very well crowd round each other in a top-heavy spiral and act their heads off from one script, you obviously want more copies. Cunningly, therefore, you will have forestalled this problem by press-ganging into your outfit a typewriter from somewhere and an efficient secretary to operate it. Carefully treated she will canalise her dramatic enthusiasm into typing—on one side of the paper and in double spacing with a good solid margin—enough copies of the play for you to begin rehearsals. You are going to find that in this new hobby a typewriter is every bit as necessary as a tape-recorder. Lacking a typewriter you will have to dig into your subscription fund to send the script to a typewriting and duplicating bureau for the requisite number of copies to be made.

When the copies are ready have a conference, allocate the parts to members of your cast, hand every actor and actress a copy of the script and give them a week to go away and read the play and get the feel of the story.

Then have a restful week yourself and a course of tranquilizers and/or pep-pills, because your headaches are just beginning.

Stephen Grenfell

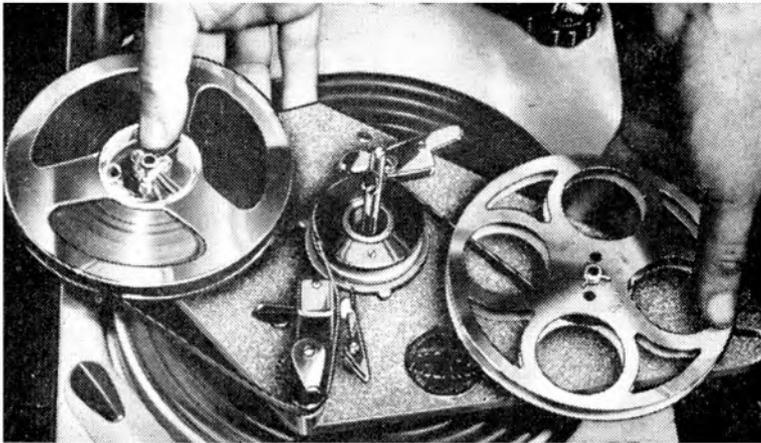
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★ Do you have any questions on tape recording—technical or otherwise? If so, send them to our Editorial Office and we will find the answer or invite readers to help. But please limit each letter to a single query to help us in answering.

Weighted noise levels

Dear Sir:—What does it mean in technical reports or reviews of tape recorders when the noise level is quoted as so many dB "weighted", and something else "unweighted"? Does this refer to different kinds of noise, or what? I know that the total noise will usually include mains hum at 50 c/s and harmonics, and valve hiss, etc., but I would like to have an explanation of this "weighting" terminology.

Yours faithfully, G. W. Leith.

In measuring the signal to noise ratio in a tape recorder, or an amplifier, the meter determines the level of the noise output relative to some standard signal. If the meter employed has an equal response to all frequencies, then the ratio obtained is said to be "unweighted", and this figure has at least the advantage that the relative performance of different machines may be easily checked with any ordinary meter.

The unweighted signal/noise ratio is, however, unrealistic insofar as it fails to take into account the ear's relative insensitivity to very low and very high frequencies at ordinary listening levels. It is found that a better idea of the true nuisance value of noise is obtained if the meter is "weighted", i.e., given a curved response characteristic which dips at either end of the spectrum to form a mirror image of the ear's response to sounds at a level of 40 phons above the threshold.

It follows that "weighted" ratios are greater than "unweighted" ones, particularly if hum is present in any marked degree. James Moir will be dealing with the whole subject of noise measurement in an article in his new series on "Testing Tape Recorders".

Unwanted superimposition

Dear Sir: I have recently bought a Philips EL3538 recorder, and one of the first things I did was to send a message tape to my brother, who has had a Regentone for about nine months. The quality of the recording, made at 3½ ips was excellent on playback, and I sent it off very pleased with everything.

He subsequently replied, and it was then that an odd phenomena occurred which neither of us, in our inexperience, can explain. His reply, recorded on top of my message, had the effect when played through my machine of a superimposition on my original recording. My voice and the others on the first tape could be heard quite distinctly in the background, and of course especially during all pauses in the second recording. Naturally I was puzzled as to why he had not noticed this defect on playback on his own machine, which he stated he had done (play back that is) before posting, and therefore kept the tape intact until he came home a few days later, so that I could demonstrate.

Incredibly (to me!) though, on playing back the second time, supposedly to show him what I was talking about, there was no background conversation whatsoever to be heard. It was a perfectly normal tape. The interval between his recording and my first playback was four days, and between the first and second playback, about a week. Can you explain this peculiarity to me please?

Yours faithfully, Miss H. J. M. F., Malvern.

The trouble here would appear to be a case of misalignment but we are not absolutely certain where to put the blame. If your brother's machine had an erase head which was slightly out of line, then it could happen that it would only partially erase your recording at the time he recorded his reply. You would then hear a mixture, which might conceivably have cleared itself up a

week later due to the slight loss of weak signals only which is sometimes associated with fast wind and rewind.

The fact that he heard only his own recording, when playing back prior to posting, could be explained if the narrower track of his record/replay head only scanned the tape over a line correctly wiped by his erase head. But perhaps other readers have laid this particular "ghost" successfully, and can let us hear about it.

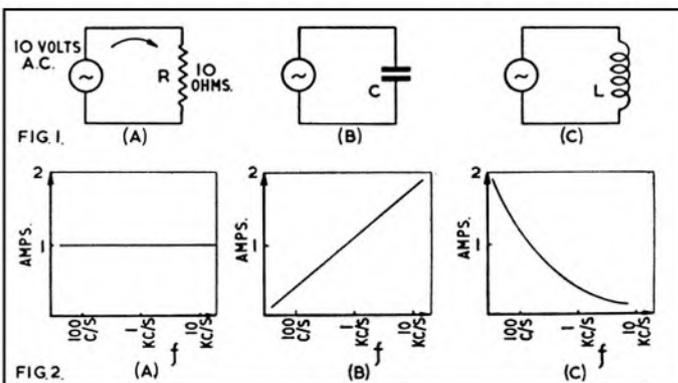
Capacitors

Dear Sir: Could you please refresh my memory as to why a capacitor can be used as a filter in a cross-over network (where it filters out the L.F. content), and yet the capacitor between say pre-amp and main amplifier must pass the whole frequency range of the signal?

I ought to know this from earlier years' studies, but I regret I have apparently forgotten this completely.

Yours sincerely, M. R. R., Bradford.

The short answer is that it all depends on the value of the capacitor (what we used to call a condenser), but you will obviously want a longer answer than that! You will remember that resistance is measured in ohms, and that the number of ohms of a given



resistor is the number of volts required to drive 1 ampere of current through it. (See figs. 1a and 2a).

Now the properties of capacitance and inductance resemble resistance, in that they can be said to oppose the flow of current. But they differ from resistance in one important respect, viz., they do not offer the same opposition to all frequencies. A capacitor offers an increasingly difficult path to low frequencies (fig. 2b). So, for a given value of applied AC volts, the current through a capacitor falls to an insignificant value below some frequency which depends on the value of the capacitor. (See my opening sentence.) In the case of lumped inductance, as in a choke or coil, we have the same situation in reverse, i.e., high frequencies are attenuated and low frequencies have an easy path (fig. 2c).

So to return to your original question, the coupling capacitor between one stage and another is chosen to have an appropriate value to pass all frequencies equally (unless some bass cut is required) whereas the correct value of capacitance to use in a crossover network is that which, in combination with the other impedances present, will act as a "gate" to separate highs from lows.

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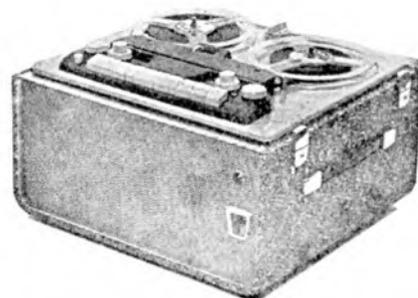
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By James Moir

REVIEWING TAPE RECORDERS



The Simon SP4 recorder was reviewed in March, and has an excellent frequency response.

PART TWO — FREQUENCY STANDARDS

THE choice of the "best" recording characteristic is a matter of considerable difficulty, and indeed there is no single optimum recording characteristic (though there may be a best for one particular type of music). The final choice is always a compromise, and is the recording characteristic that produces the best results when using average tapes to record typical music under normal studio conditions. This apparently simple problem of determining the best recording characteristic has occupied a large number of the best brains in Europe for several years, and there is now a large measure of agreement. This has been secured through one of the international standardising organisations, the International Radio Consultative Committee. The result is generally known as the C.C.I.R. characteristic.

There are some fundamental difficulties in measuring the flux density recorded on the tape, and, in consequence, the recording characteristic is specified in terms of a replay characteristic. The agreed C.C.I.R. recording characteristic is secured when a flat overall response is obtained from a record/replay chain in which the replay equipment has the response curve shown in fig. 4.

This indirect method of specifying the recording characteristic is used because there was, at the time of standardisation, no un-

ambiguous method of measuring the flux density impressed on the tape. The performance of a replay chain may easily be measured, the only equipment required being an oscillator, attenuator and valve voltmeter, whereas the determination of the surface magnetic induction on the tape is extremely difficult. There is no magnetic equivalent to the Buchman-Meyer method of measuring the groove amplitude on a gramophone record.

NARTB used in America

The American companies and broadcast organisations have separately agreed on a slightly different curve, the N.A.R.T.B. (National Association of Radio and Television Broadcasters) replay characteristic shown in fig. 4. The shape of the replay response indicates that more HF boost is used in recording than when recording to C.C.I.R. standards. It is now some years since the C.C.I.R. standard was chosen, and I would hazard a guess that, if and when the standard is revised, it will be brought into line with the American N.A.R.T.B. standard, for this appears to result in a slightly better signal/noise ratio than the C.C.I.R. response curve.

Most domestic tape recorders claim that their recording amplifier is equalised to C.C.I.R. standards, but in some of the cheaper ones this is something of a gesture rather than an accomplishment, for though the overall response may be moderately flat it is often secured by under-emphasis in replay and over-emphasis in recording. Commercially recorded tapes are all made to C.C.I.R. standards, and the optimum performance is not secured when replaying on these machines.

The uncorrected curve

The fundamental processes of magnetic recording result in the voltage across the replay head having an output voltage/frequency response similar to that shown in fig. 5, when the record head is excited by a constant current at all frequencies. The C.C.I.R. standard requires that the low frequency loss be corrected in the replay



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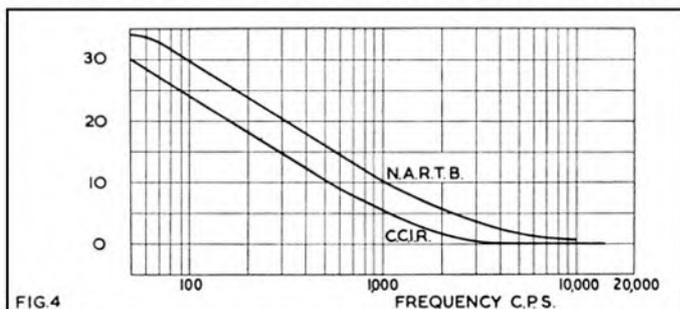


Fig. 4. Replay characteristics for the two standards now in use.

amplifier, which must have a frequency response that rises at 6 dB/octave below a frequency of 1,700 c/s approximately (for a tape speed of $7\frac{1}{2}$ i/s). Thus at 50 c/s the replay amplifier must have a gain 30 dB higher than at 1,000 c/s. Above 1,700 c/s the replay response departs from the 6 dB/octave slope, thus providing some compensation for the HF losses in recording.

The remainder of the correction required to turn the basic head response of fig. 5 into the C.C.I.R. recording characteristic must

(Continued on page 37.)



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REVIEWING TAPE RECORDERS—(continued)

be provided by the recording engineer. The compensation required varies with the make and type of tape being used, and, while this introduces little complication into commercial recordings, it means that the designed overall response curve will only be secured from a domestic tape recorder when the make of tape specified by the designer is being used on the machine.

Head losses

Apart from the tape equalisation required to achieve the C.C.I.R. recording characteristic, and to correct for the basic replay head performance, additional equalisation must be introduced to correct for the frequency-dependant losses in record and replay heads. Thus the overall response curve of a tape recorder is the sum of the basic response curve, equalisation for the particular tape being used, correction for the record and replay head losses, plus the shaping required to produce the C.C.I.R. response. Bearing in mind the difficulty of matching a loss curve with its equalisation curve, it is hardly to be expected that the final overall response will be quite as smooth between the upper and lower frequency limits as can be obtained in a typical high fidelity amplifier. In my opinion, smoothness of response between say 70 and 10,000 c/s is more important than any extension of the frequency range beyond 14,000 c/s.

Tape speeds

The frequency range that can be obtained from any machine is ultimately limited by the tape speed. Current machines may obtain a response that is flat within 3 dB ($\pm 1\frac{1}{2}$ dB) between 50 and about 18,000 c/s at a tape speed of $7\frac{1}{2}$ i/s, and 50 to about 13,000 c/s at a tape speed of $3\frac{3}{4}$ i/s. Tape speeds of 30 and 15 i/s are almost obsolete in domestic machines, for an adequate performance can be secured from tape running at $7\frac{1}{2}$ i/s.

Practically all tape machines include some form of tone control that allows the extreme ends of the frequency range to be adjusted to suit the user's taste. When the millenium arrives this will not be necessary, but at the moment, and for a long time to come, every user will demand some form of adjustment to compensate for the differences between loudspeakers, rooms, microphones and for differences of opinion as to what constitutes good reproduction.

Tape records

The sales of commercially recorded tapes have hardly set the world on fire, rather suggesting that few purchasers of a recorder use tapes as a replacement for gramophone records. When using the machine to replay these commercially recorded tapes, the response of the "record" side of the equipment is of no significance. Thus several

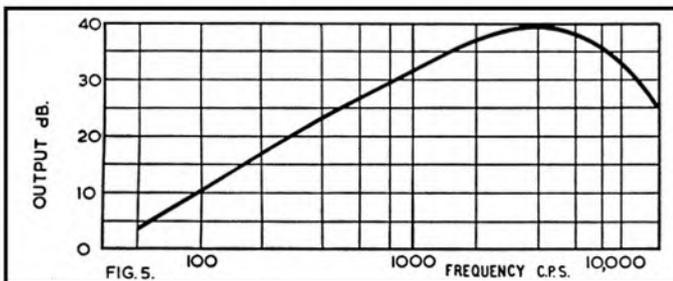


Fig. 5. Uncorrected response of record/replay heads

response curves have to be measured. The first curves are taken with a standard test tape carrying test signals covering the frequency range between 40 and 10,000 c/s. The tone controls are first set to "max" and then to "min", it being assumed that any desired response between these two limits can be obtained by appropriate settings of the two tone controls. This assumption is not always true, for some of the cheaper machines use tone control circuits in which there is interaction between the two controls, the setting of one control affecting the performance of the other.

The curves are then repeated using an oscillator input signal to the "microphone input" socket in place of a test tape, a procedure that checks the performance of the complete record/replay system.

Many machines particularly those of continental origin, include an extra output socket intended to feed an external amplifier. This is a good scheme, for the signal may be taken out at some point before the output stage, thus eliminating the major source of harmonic distortion

The Taplin - Hurst Balmoral recorder was reviewed in June, and found to possess a frequency response adequate for amateur use.



in domestic machines, a subject that will be dealt with in a later instalment. When such a socket is included, the output is generally not controlled by the tone controls or the volume control. More precise correction can thus be obtained, some domestic machines achieving a performance at this socket that is of professional standard.

Test tape is used

When testing frequency response, the E.M.I. test tape TBT 1 is used, but it is frequently checked against a professional EMI test tape (SRT 13) to confirm that all is well. Most of the better machines are checked using the SRT 13 tape itself, to minimise possible discrepancies. The output voltage is measured across a resistance load equal to the impedance of the extension speaker specified by the designer of the machine, an Advance Advac valve voltmeter being used. Where an extra output socket is fitted, the response curve is repeated using the Advac alone across the socket. As previously noted, the designed performance is rarely secured unless the make of tape specified by the designer is used, so this precaution is always taken. The results are presented in the form of curves to avoid any ambiguity, and to indicate, when it occurs, that the middle range response includes a few "wiggles".

J. Moir.

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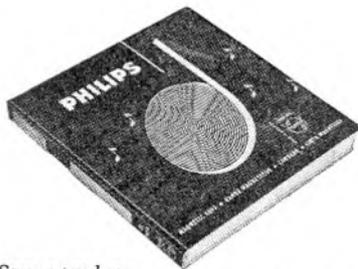
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Practical suggestions for the tape handyman_____by A. Bartlett Still

No. 9 ROUTINE MAINTENANCE

AS I promised at the end of my notes last month, I propose now to deal once more with the question of maintenance of tape recorders, this time looking at the electronic chassis. To those of my readers who are already saying to themselves that with their inadequate knowledge of electronics they had better let well alone I would hasten to say that, largely, that is my advice to anybody!

The great beauty of electronic apparatus of any sort is that it does not need maintenance. In other words, you don't touch it while it works! However, to prove that I am not writing this month's column under false pretences, let me point out that 80 or 90% of the faults that arise in the electronics department of a tape recorder are switching faults, and switches are mechanical devices to which attention can be given easily, and to good effect. The symptoms of a switch fault are usually a crackling noise, intermittent or continuous, or a failure to work at all unless the switch is operated a few times.

Deterioration in performance

The remaining faults are usually indicated by a general deterioration in performance, or a sudden cessation, which may or may not be accompanied by a smell of burning! Finally, crackling noises of various sorts may become evident that cannot be easily associated with a selector switch.

This rough and ready bracketing of possible faults into four categories has been carried out with a view to determining just what we can do, simply, to prevent them arising. The slow

deterioration in performance does in fact start, unnoticeably, when the machine is first used. This represents the usage of available valve life and is accepted. A sudden and complete failure to operate will probably be due to a random component



An important part of the routine maintenance of all electronic equipment is regular checking of switch contacts.

failure and cannot be guarded against (except in the original design). Those who have a suitable voltmeter available can, however, simplify "trouble-shooting" by preparing a table of HT voltages, etc., at the various points while all is in order. Comparison can often show where a fault of this nature lies.

A table of this kind should not only show where HT is present, and its magnitude, but also where it is absent. Voltage in the wrong place may be the cause of the smell and indicate a capacitor break-down! A more serious fault of this nature may show itself by the persistent blowing of fuses, it should *not* be overcome by the fitting of a heavier fuse.

Leaving the subject of switches on one side for a moment, let us look at the other causes of crackle. Crackling will usually indicate a poor connection, either wanted or unwanted. Dirty valve pins, making a poor connection in the holder, is one example, curable with a pocket-knife blade. A worn track on a potentiometer is another, requiring replacement. A common example of an unwanted connection is the wearing away of insulation on a wire where it touches part of the metal work.

Any such points can be located and reinforced with a bit of insulating tape, either round the wire or on the offending metal edge. Dry-soldered joints are, happily, not common these days, but they do occur. Such a joint will usually have a "powdery" look, or the solder will have formed itself into a small globule and not be "faired in" to the tag. Such a joint can be loosened completely by a few judicious tugs on the wire, and must be resoldered, cleaning wire and tag if necessary.

Check the switches

There can be no doubt, however, that the most profitable way in which attention can be given to the "Electronics Department", with a view to preventing trouble at a later date, is to deal with the various switch contacts. These are often made of brass or phosphor bronze, silverplated, mounted on either paxolin or plastic. Heavy oxidation of the plating is one possible cause of trouble that can be largely prevented by the introduction of a smear of vaseline. Switch cleaning fluids are available, usually consisting of a cleansing solvent which, after evaporation, leaves a lubricating film. Such fluids should always be used sparingly, particularly on continental machines where the switch banks, like the heads, often use a plastic that is soluble in Carbon Tetrachloride.

One final point, valves dissipate a fair amount of heat, which could adversely affect the performances or life of other components. Unless the makers specifically allow it, never run your machine with the lid closed, and if it has ventilation louvres in the bottom, watch that they are not restricted by a soft rug or carpet if the machine is stood on the floor.

Next month I shall be suggesting ways of connecting your machine to other apparatus to obtain the best playback performance.

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Re-recording of Gramophone Records

WARNING

on copyright infringement

All the principal gramophone record manufacturers collectively wish to bring to general notice that on the 14th April, 1959 one of the members of the Industry obtained an injunction in the High Court against an offender restraining the re-recording (dubbing) of its records on to tape and that legal action will be taken by the individual manufacturers concerned in all similar cases which may come to the notice of the Industry in order to prevent the infringement of their copyright.

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.



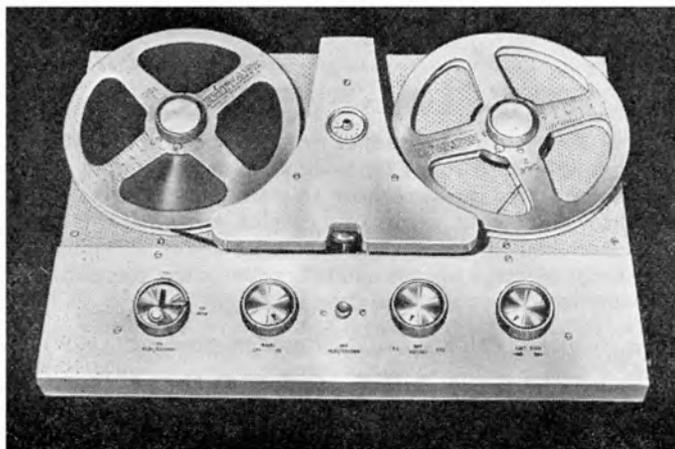
★
**The Crown Tape
 Machine just
 announced
 by Audio
 Amplifiers Ltd.**
 ★

WE have received advance information of a new tape recorder, the Audio Amplifiers Ltd. "Crown", the design work on which was carried out by the well-known associate company, C.Q. Audio Ltd. It employs the Collaro Studio deck, operating at the three speeds $7\frac{1}{2}$, $3\frac{1}{2}$, and $1\frac{1}{2}$ i/s. There are useful facilities such as superimposing and "straight through" amplification, in addition to a monitor switch, magic eye, and digital position indicator. The wooden case is covered in dark green and grained grey leather cloth. Negative feedback is used to produce the correct equalisation for each speed, and the 4 watt amplifier feeds a larger than usual loudspeaker. Price, including microphone and 7 in. reel of tape, £40 19s. Further information from Audio Amplifiers Ltd., No. 3 Factory, Tye Green, Bush Fair, Harlow, Essex.

Entirely new Multimusic "professional quality" tape deck

INITIAL supplies of a new Multimusic Tape Deck will soon be available to manufacturers of high fidelity equipment. Multimusic Ltd. claim that this is probably the first British deck of "professional" quality to be made in quantity.

There are no belts or interwheels, and in operation there are only five moving parts. Three of these are the motors, all specifically designed for the job, one being the main drive motor, syn-



chronous or alternatively hysteresis synchronous, and two side motors. Instant start and stop is possible. The only other moving parts are the pinchwheel and a gear-driven clock-type tape position indicator. The main motor, which is direct drive can be reversible and provision is made in the head assembly unit for 3 heads to be accommodated each side of the capstan.

It is therefore possible to produce machines for stereo quarter track recording with professional quality. An additional refinement is a provision for a connection, which, when the tape recorder switches itself off, will automatically cut the AC supply to an amplifier and any ancillary equipment such as a radio tuner unit which may be connected to the recorder deck.

Open access is provided to the heads for ease of editing, and, as standard, the deck is supplied for use with reels up to $8\frac{1}{4}$ in. diameter. Fast wind forward and back, which is guaranteed will not stretch or break even the thinnest tape, is entirely electrically controlled by a single knob, and 1,200 feet of tape can be wound in either direction in 45 seconds. A mechanically locked "Park" position holds the reels gently but firmly when the function switch is in the "off" position.

The new Multimusic deck which has been styled by industrial designer, Douglas Scott, M.S.I.A., is standard rack size, 19 in. width, and will be used in a new range of Reflectograph tape recorders, details of which will be announced in the near future. However, a new departure in Multimusic policy is that the deck will be supplied to manufacturers of high fidelity equipment but not direct to the public.

Further information from **Multimusic Limited, Maylands Avenue, Hemel Hempstead, Herts.**



★
**The new Sound
 Recorder is called
 the "Studio" and
 uses the Collaro
 Studio Deck**
 ★

A NEW lightweight from the Sound stable weighs only 22 lb., and is called the "Studio". It claims a frequency response of 60-12,000 c/s \pm 3 dB at $7\frac{1}{2}$ i/s, and hum and noise are at - 50 dB. Wow and flutter are 0.15% at $3\frac{1}{2}$ i/s, and mixing is added to the usual list of facilities. The "Studio" measures $15\frac{1}{4} \times 14\frac{1}{4} \times 7\frac{1}{2}$ in., and retails at £44 2s. The manufacturers are **Tape Recorders (Electronics) Ltd., 784 High Road, Tottenham, London, N.17.**

A new brand of professional grade tape

A SPECIAL feature of the Ferrodynamics Brand Five recording tape, is that professional studios may obtain supplies on full-size 10 in. reels. Two types of base are available, on 5 and 7 in. spools as follows: Acetate, 600 ft.—5 in., 16s.; 1,200 ft.—7 in., 25s.; 1,800 ft.—7 in., 46s.; 2,400 ft.—7 in., 65s. Write for further information to **Electro-Techno-Dynamics, 101 Leadenhall Street, London, E.C.3.**

The NEW PERTH CLARISSA tape recorders



Elegant carrying case with olive green spanish hide finish, gilt fittings and a cream plastic front. Easy portability. Highest quality components. Three speeds (7½, 3½ and 1½ inches per second). Maximum playing time of four hours. Tape spools up to 7" diameter. Wow and flutter better than 0.15 per cent at 3½ ips. Full mixing and superimposing. Unit construction gives easy accessibility and servicing. Separate compensated inputs for microphone, gram/radio. Extension speaker socket with automatic muting of internal speaker. Dimensions 18" x 13" x 7".

CLARISSA MK I price 42 gns.

Frequency response up to 10 kcs. Magic-eye. Full-range tone control. Large high-flux speaker giving 3 watts undistorted output. Complete with crystal microphone and 1,200 feet recording tape. Weight 23lbs.

CLARISSA Twin de Luxe MK 2 price 56 gns.

Frequency response virtually straight line from 40-12,000 cycles ± 3dB. True aural monitoring through separate built-in amplifier channel gives studio grade recording under all conditions. Independent bass and treble controls. Special "grain-orientated" transformer and Mu-metal screening for maximum hum-level suppression. Large bass speaker unit with matched Tweeter unit ensures finest quality output, 4 watts. Complete with dynamic moving coil microphone and 1,200 feet recording tape. Weight 26lbs.

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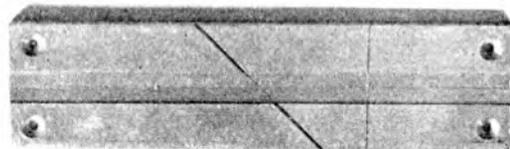
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THE TAPE RECORDER

99 Mortimer Street, London, W.1

our readers write

★ We award a prize of one 5-inch spool of Tape each month for the best letter printed either on this page or amongst "Readers' Problems." This month the prize goes to J. F. Archer. Letters not intended for publication should be clearly marked NOT FOR PUBLICATION.

. . . about reviews of magnetic tape

From:—J. T. Harris, 26 Dare Road, Erdington, Birmingham 23.

Dear Sir:—As a subscriber to *The Tape Recorder* and *Hi-Fi News*, the one item conspicuous by its absence from Reviews of Equipment etc., is magnetic tape itself! In the course of time the owner of tape recorder may well spend many times the cost of his recorder itself on tapes, yet this is the one item that is never tested! How can the user be expected to choose between the umpteen makes on the market without some guidance from the technical magazines?

I have a Vortexion WVA recorder, and as you know it is supplied with the Bias setting and Max Meter setting for Ferrograph Tape. What I wish to know is the settings for other tapes which are usually cheaper than the Ferrograph tape. As the Vortexion settings must vary with each machine, I should require the setting for other tapes as a percentage of that required for the Ferrograph tape, e.g. 25 per cent. greater bias and 10 per cent. greater mod. deflection. I should be grateful for any guidance you could give me on this question of tape selection and use.

Yours faithfully

It will nearly always be best to stick to the make of tape recommended for your particular machine. You will notice, however, that several manufacturers now market a number of different grades of tape.

We are preparing to meet your request for more information on the various brands of tape with a new series of articles in which a particular manufacturer's tapes will be discussed each month. This will not provide your percentage comparisons, unfortunately, but we feel it will answer many people's questions on the characteristics of each type of tape. We would point out too, the article describing some anonymous tape comparisons in the December issue of Hi-Fi News.—(Editor).

. . . about a registered telegraphic address

From:—D. T. Bennett, Managing Director, Film Industries Ltd.

Dear Sir:—Our attention has been drawn to page 377 of your current issue wherein a correspondent refers to products under the name of "Trusound".

We would draw your readers' attention to our registered telegraphic address which we have possessed since the early 1930's. Application was made to the appropriate authorities for the registration of Trusound but this was refused and the present registered name allotted: TROOSOUND.

As our legally registered name now has a world-wide reputation, we would ask the indulgence of your columns to make it clear that a near plagiarism would be treated very seriously by this company.

Yours faithfully

. . . about TV recording again

From:—J. C. Lenahan, 1 Buckingham Crescent, Newport, Mon.

Dear Sir:—Re your correspondents—J. E. P. of Maidstone, and A. N. B. of Warrington—letters on recording from TV, perhaps I can tell them what I, or rather my TV engineer did. I may say that the engineer is one of the very few really honest folk who treat their calling more as a vocation. He fitted a 1:1 transformer, the same as he has done for people with hearing aids; I gather it was a simple matter. Added to that, I made sure that the chassis was on the earth side and now I have no difficulty. I just plug in to a co-ax socket and set the volume to room comfort, and the eventual result is better than that which

emanates from the small TV L/S. I play back all my tapes via a hi-fi radio, as the speaker in the tape recorder is rather small for good range. Incidentally, all my equipment is from the same maker.

Yours faithfully

. . . about A. Tutchings' kit for monitoring

From:—J. F. Archer, 75 Beechwood Drive, Woodford Green, Essex.

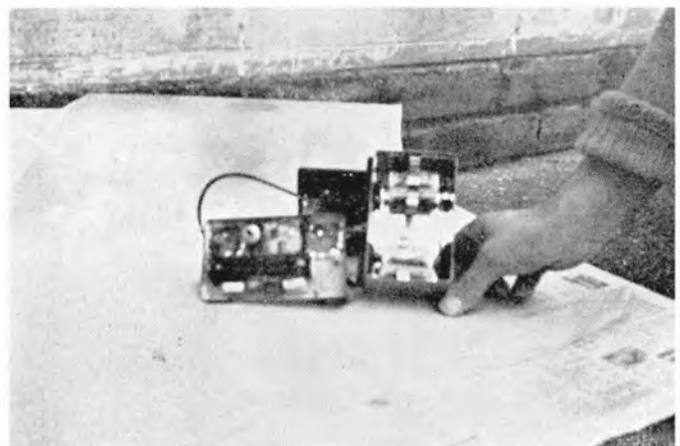
Dear Sir:—I have been prompted to write to you as a result of carrying out an idea that occurred to me when reading Mr. Tutchings' articles on "Building a Simple Tape Recorder". In



The extra head is situated by the off key, and the tape is not threaded for transistor playback to show the guide.

his first article Mr. Tutchings gave details of a Transistor Amplifier and in a subsequent article suggested that with this amplifier and a suitable magnetic head, mounted on a tape deck immediately following the recording head, it would be possible to monitor recordings.

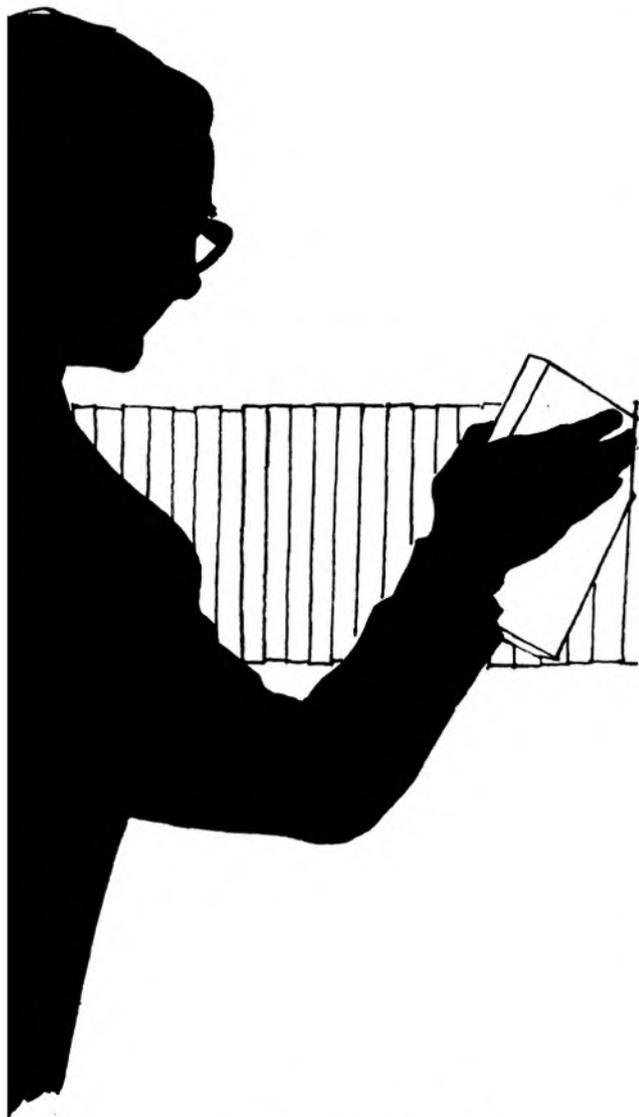
I have a Truvox Tape Deck mark IV and a pre-amp and erase unit, both of which I have built into a cabinet with provision for replay through a Hi-Fi system. I am able to monitor record-



Pre-amp on chocolate strip is mounted in lid (left).

ings and arranged a switch to divert the voltage from the erase head, thus making it possible to superimpose. However to have control over this was another matter, and a real problem until the introduction by way of your magazine to this little amplifier.

(Continued overleaf.)



Those who sell
recommend . . .



WORLD'S LARGEST SALES OF MAGNETIC TAPE

READERS' LETTERS—(continued)

It then occurred to me to mount a magnetic head in front of the erase head and with this little kit it would be possible to listen by phones to whatever was on the tape before its arrival at the recording head. This I have now accomplished, and find it of immense value in many ways and an absolute necessity for superimposing. This facility is incorporated in some machines, but, for a matter of a few shillings, a little time and patience it is possible to add the feature to most models.

The enclosed photographs show the Transistor Amplifier and Batteries fitted into a box, with the necessary leads and sockets etc. This box I have placed in my cabinet and leads are taken up through the side of the cabinet and along the deck to the head, to a socket for phones, and to a battery switch. These latter are affixed to the side of the cabinet. A second switch is shown but this is to be connected up later for further play/record experiments.

Mounting the head was a process of trial and error. I constructed a little container for the head cut from a piece of perspex, and obtained the required height by adding thin pieces of cardboard between the floor of the container and the base of the head. When this was satisfactory for the passage of the tape across the head, I positioned it as close as possible to the recording head. With my machine, I could not get nearer than half a second at a speed of $7\frac{1}{2}$ i/s. A 7 B.A. screw with appropriate nuts supplied the necessary guide for the tape, and this was placed so as to pass the tape across the head making intimate contact, but with the least impedance to the transport of the tape.

As the idea of this came from reading your magazine, and as the result is in every way satisfactory, it is possible that other readers may be interested. Like many others of your readers I find that your magazine does indeed supply that interest and stimulant for this form of home and family entertainment and enjoyment.

Yours sincerely

. . . with a Stuzzi in Yugoslavia

From:—J. D. Treherne, 12 Lessar Avenue, Clapham, London, S.W.4.

Dear Sir: I recently toured with a Stuzzi tape recorder off the Yugoslavian coast. We recorded a conversation between myself and a Yugoslavian friend (who fortunately could speak English), and this created much interest among the Yugoslavian natives on the coastal steamer on which we were travelling.

There is much interesting material to record in Yugoslavia. There seems to be a National Scheme for holidays, and everywhere we went we met bands of 20 children in the care of an adult, on their way from place to place complete with blankets sleeping bags etc. There was always one who had a musical instrument—accordion, concertina, or even a simple wooden whistle—and they were always more than willing to comply with my request for a recording. Sometimes their enthusiasm was too much for me. For instance on the way to Pula a band of boys about 12 years old kept me recording and replaying for nearly 5 hours. But I have much pleasure in listening to them in the coldness of our dreary winter.

As a raw beginner I have much to learn. I would like to know the technique of cutting out unwanted sounds. For instance, on a train when trying to record a conversation or a song, the noise of the wheels and the internal echoes drown the words. I have written to many firms to try and buy a directional microphone but neither Grampian nor Lustraphone make one.

I have seen advertised in American magazines directional microphones which are not only directional but actually double the output from the sounds reversed.

Incidentally I think your magazine is excellent, I like the articles by A. Tutchings, as I am in the process of making a small pocket recorder which has no erase (I shall use virgin tape) and no playback, using tape speed of $3\frac{1}{2}$ i/s. I hope to achieve something approaching the quality of the Stuzzi, but about $\frac{1}{2}$ the size and weight. The governed motor has given me much

READERS' LETTERS—(continued)

trouble, but I have now fitted a successful governor to an ex-government Hoover 24v motor. At about 2,000 r.p.m., it uses 100 mA at 12v and gives a torque of approximately 0.3 oz. in. Starr-Kinde make one especially for tape recorders but I have not been able to trace one so far. I hope Mr. Tutchings gets around to AC bias in order to improve quality, also an input level indicator which I think is absolutely essential.

Yours faithfully,

* * *
... about a handy carrying case

From:—D. A. King, 42 Banyard Road, London, S.E.16.

Dear Sir:—After reading John Borwick's field trial of the Grundig "Cub", I thought that owners of the same machine or similar may be interested in a carrying case that I have made for my own "Cub" which does away with the need to carry the lid, which was a nuisance, makes it easy to operate, adds very little weight and, the main object of the case, keeps it hidden from prying eyes.

A plastic brief case was adapted, the type with one large zip pocket on one side of the case. A 12 in. x 12 in. piece of aluminium sheet was bent to make a three-sided box with 4 in. sides and bottom. One side and the bottom were covered with rubber pads inside, the other side has pads positioned where the speaker and sound channel would come in contact with them. The aluminium sheet only covers half of the sound channel. This was done to allow easy access to the controls and also allows you to see how much tape you have left on the spools.

The shoulder strap is 72 in. long and I find it is just the right length. To hold the strap in position, strips of leather were used, riveted to the case on either side by split rivets, and covered with cycle repair rubber inside the brief case so that the sharp edges of the rivets did not scratch the recorder. By using the leather strap in this way it can be slipped out of the holding strips and the case can be carried in the normal way. The shoulder pad I made from a sample piece of rubber-based carpet.

I didn't find the tiny wire brackets that held the spools in place very easy to handle in a hurry, so I have made my own from two large-size paper clips cut in half and bent up one end about ¼ in. I find these much easier to use.

John Borwick mentions that there is no room for the microphone, but current models are now sold with a plastic case to house the "mike".

When using the brief case it is unnecessary to use the "mike" case as the "mike" can be stowed underneath the carrying handle of the recorder. Also, if the side pocket of the brief case is a large one it will hold four boxed tapes quite easily.

Hoping this will be of some use to your readers.

Yours faithfully

* * *
... about amateurs v. professionals

From:—Cathedral Sound, 38 Nutfield Gardens, Northolt, Middx.

Dear Sir:—What is now a rapidly growing hobby for many has been our business for a long time. In fact, we must be among the pioneers in the commercial field of tape in this country, having originated our first Send Your Voice message in 1948, followed by the first complete Morse Code Tuition on tape for No. 78 Squadron of the Air Training Corps.

In recent years we have noticed a distinct drop in many of our recording jobs, which has been due directly to amateur recorder owners accepting the type of work which would normally come our way. This year, for example, we have had three weddings cancelled, because one of the guests volunteered to record the ceremony for nothing—and we have afterwards been approached to sort out the muddle resulting from their efforts. Needless to say we declined this offer!

We have now reached the stage of having our Christmas engagements cancelled for the same reason, and many of our regular message customers are finding amateurs to execute the

(Continued on page 47)



*Those who know
insist on . . .*



WORLD'S LARGEST SALES OF MAGNETIC TAPE

T S L present the most advanced recorder programme ever

**THREE
4 TRACK
STEREO
RECORDERS**

No add-on Units required
Also record and play mono
8 HRS PLAYING ON 7" REEL AT 3 3/4

From TSL come today's most advanced Continental tape recorders, each with its own special features to give you choice from a range that will be modern for years to come. With any of the three, live stereo recording becomes as practical and as simple as single-channel operation, and you don't need an add-on unit to do it. Used monaurally, you make a fabulous saving in tape costs for

each reel gives twice or four times what is obtainable from a conventional mono. instrument. Thus 8 hrs. playing from a 7 in. reel at 3 3/4 i.p.s. is possible, and the heads and amplifiers used in each of these models ensures the highest standards of reproduction. Many other advantages are offered by these instruments, particularly for owners of photographic equipment, and are described in the leaflets available.

HARTING HM8 (illustrated below.)

4-track, 2-speed recorder (7 1/2 and 3 3/4 i.p.s.) with two speakers (one in lid) for direct stereo replay. Overall response 30-20,000 c/s ± 3dB. Heavy Engel Motor, Telefunken heads; pause, superimpose and monitor facilities, etc.

86 GNS

ELEKTRON 9S/4K

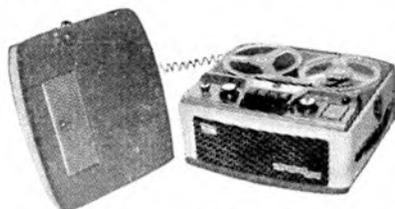
4-track, single-speed recorder (3 3/4 i.p.s.) in small compact "airline" styled case. 2 15-ohm outlets; built-in speaker and dual amplifiers for record and playback. Pause, superimpose, monitor facilities, etc., etc. Response 30-16,000 c/s ± 3dB. Squirrel-cage motor by Papst.

77 GNS

KORTING Mk. 128

4-track, single-speed recorder (3 3/4 i.p.s.). Telefunken heads, built-in speaker for monitoring. Response 30-16,000 c/s ± 3dB. 5 watts total output. Superimpose, pause, etc., etc. Heavy-duty A.E.G. motor. 7" reels.

68 GNS



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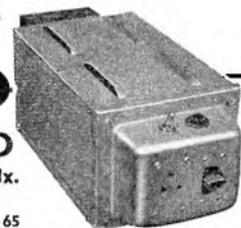
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READERS' LETTERS—(continued)

work. We wonder if this is just our bad luck, or if the recording trade in general is experiencing the same inconvenience?

Yours faithfully

To an extent, we imagine this is bound to happen. Professional photographers must have suffered a similar slight at the comparable period of amateur photographic enthusiasm; but we would wager that professionals photograph most weddings today. In spite of all the aids and inducements to persuade Mr. and Mrs. X to sweep the chimneys, paper the walls, and spray the car, the man who really knows his job, and who has the best tools for it, will get the bulk of the work when enthusiasm wanes and "time" once more asserts its dominating influence.—Ed.

... about slide projectors

From:—F. B. Phillips & Co., Electronic Engineers, Wallasey, Cheshire.

Dear Sir:—An article in your October, 1959 issue has been brought to our attention. The article described the automatic control of a slide projector by means of a pulse input from a tape recorder.

We would like to point out that we have for some time produced an Electronic Projector Control which feeds a low frequency pulse into the recorder on the same track on which the usual descriptive recording is being made. This system of course requires no extra head and retains the twin track facilities. Due to the slight modification required we find that any recorder can be used with this unit.

The Liverpool Museum uses these units in conjunction with Grundig TK5 recorders for educational purposes. Trust this may be of interest to you. *Yours sincerely*

... about the FI-CORD Review

From:—J. Ripington, 30 Breamish Street, Jarrow, Co. Durham.

Dear Sir:—I feel I must write in support of Mr. Gough of Fi-Cord re Mr. Moir's remarks about this transistorised portable (September issue).

I have a Fi-Cord portable and find it an excellent machine. I have recorded music with very good results and sound effects too numerous to mention. I only use the 7½ i/s, the tape I transfer on to my Ferrograph, where it is edited through my Vortexion mixing unit. In conjunction with the Fi-Cord I use a Grampian DP4/M microphone which gives me very good results. I should add that I find the Fi-Cord speed "spot on" with my Ferrograph.

I did think that Mr. Moir's review of this little machine rather harsh. In my own personal opinion, it is essential to have a machine for some considerable time in order to understand it—one has to live with it day in day out—am I right in thinking that your critics do such? *Yours faithfully*

So far as time permits, our reviewers treat the equipment as part of the "household effects" during the review period, in addition to carrying out objective measurements, etc.—Ed.

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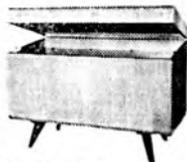
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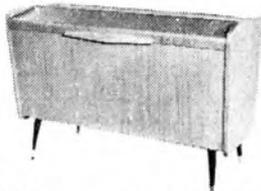
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ADVERTISERS' INDEX

	Page
B.A.S.F. Tape	52
Cape Electrophonics Ltd.	31
Cosmocord Ltd.	6
C.O. Audio Ltd.	48
Dickinsons of Pall Mall	38
E.A.P. (Tape Recorders) Ltd.	24
E.M.I. Sales & Service Ltd.	4, 5
Essex Tape Recorder Centres	46
Fi-Cord Ltd.	16
Francis of Streatham	36
Gopalco	48
Gramdeck	32
Gramophone Co. Ltd., The	28
Grundig (G.B.) Ltd.	51
Howard Photographic	30
Lee Products (G.B.) Ltd.	2, 20
Lustraphone Ltd.	40
Magnegraph	33
Metro Sound Mfg. Co. Ltd.	35
Minnesota Mining & Mfg. Co. Ltd. (Scotch Brand Tape)	44, 45
Modern Techniques	18
M.S.S. Recording Co. Ltd.	36
Multicore Solders Ltd.	25
Nusound	47, 50
Perth Radios Ltd.	42
Philips Electrical Ltd.	38
Rapid Recording Co.	23
Rapps Tape Recorders	50
R.B. Tapes	34
Recorder Co., The	40
Reps (Tape Recorders) Ltd.	8
R.E.W. Earlsfield Ltd.	37
Romagna Reproducers Ltd.	39, 42
Simon Equipment Ltd.	10, 22, 34
A. L. Stamford Ltd.	50
Tape Recorder Centre	7
Technical Suppliers Ltd.	46
Tuttings Electronics Ltd.	49
Valradio	46
Wellington Acoustic Laboratories Ltd.	48
Welmec Corpn. Ltd. (Telefunken)	3

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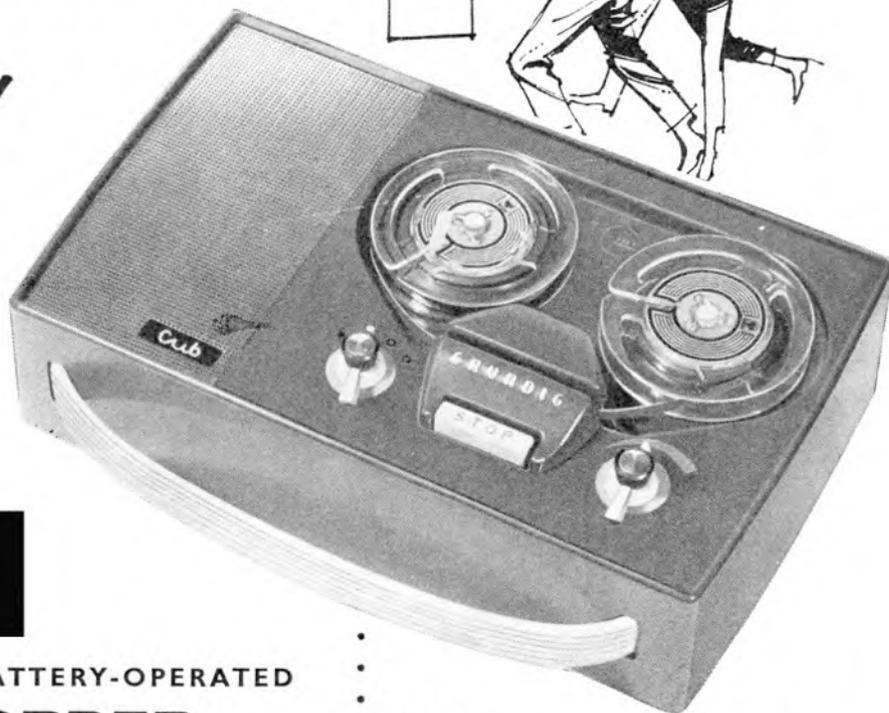
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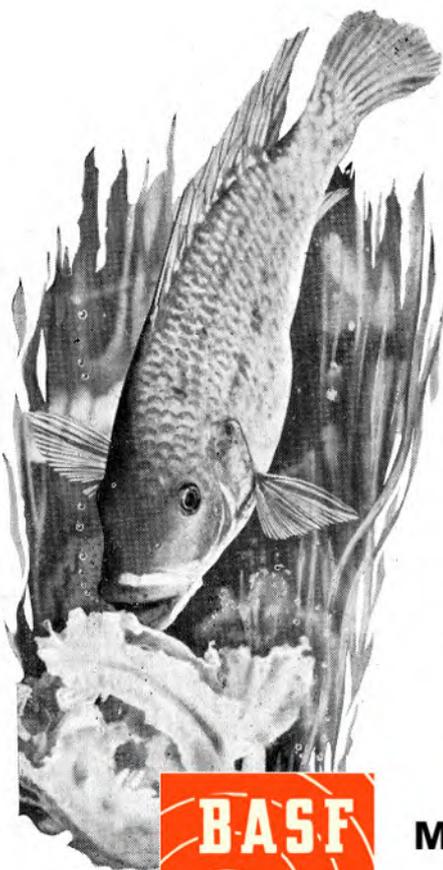
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