

the TAPE RECORDER

PRICE 1/6

DECEMBER 1959

Vol. 1 No. 11

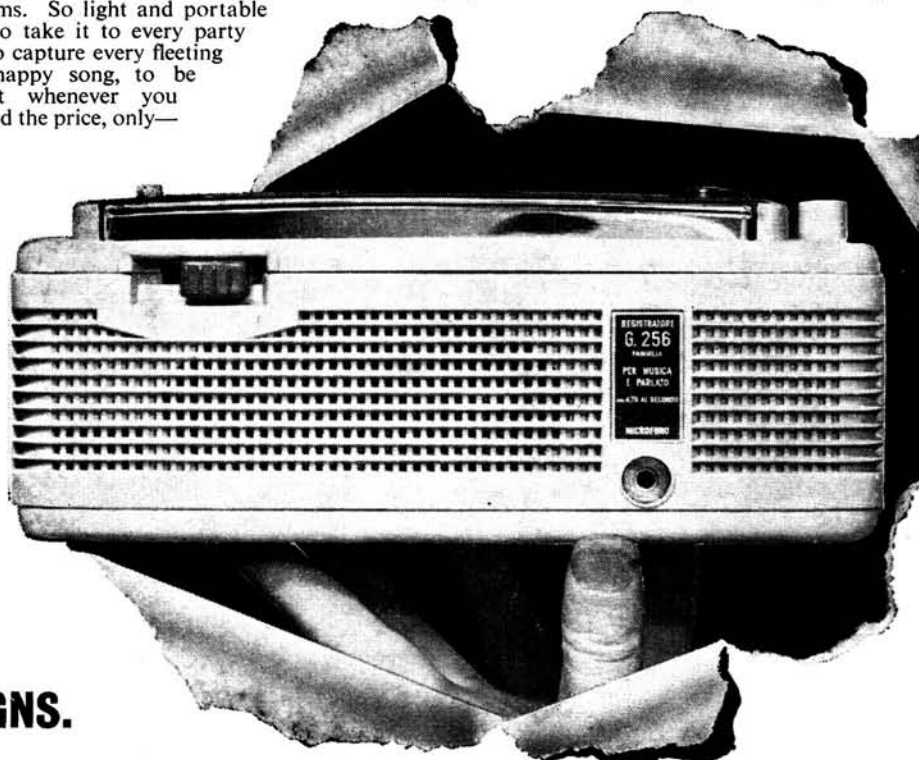


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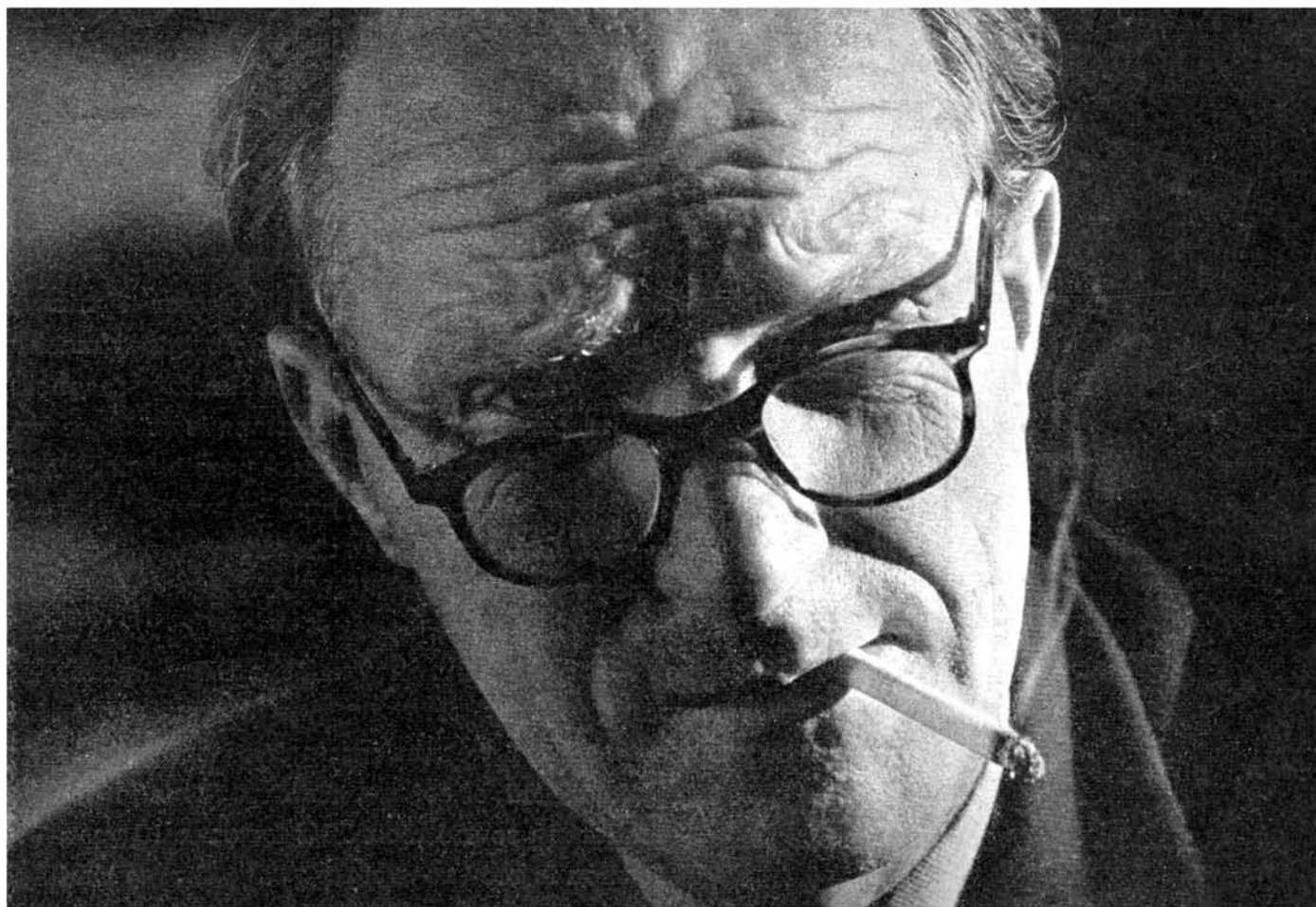
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LP. 133

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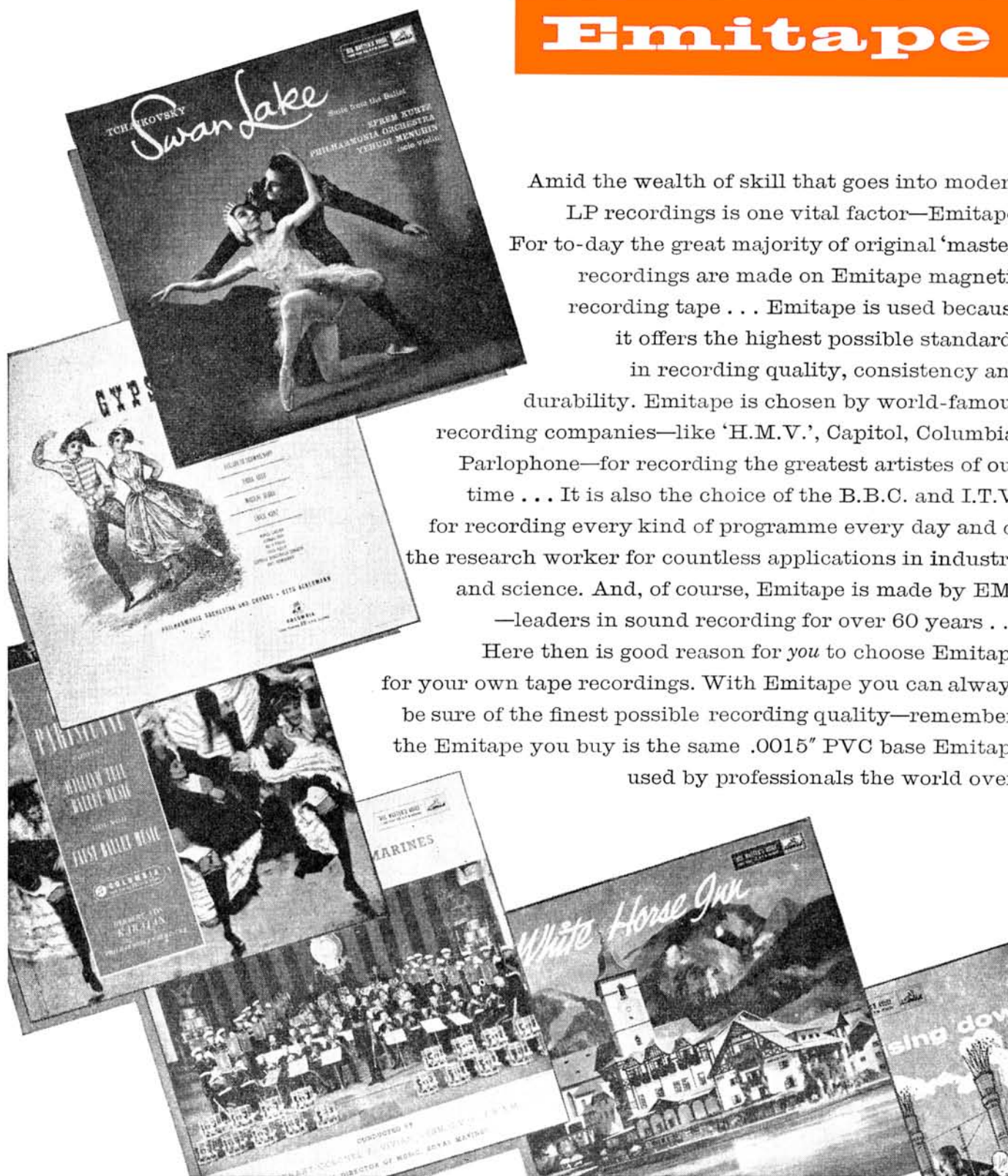
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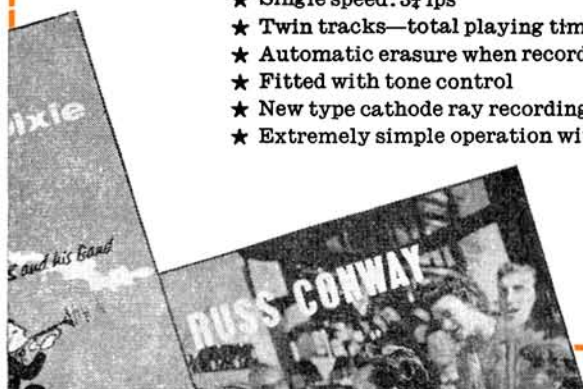
Model 441 T.R. portable tape recorder

This portable model with an output of $2\frac{1}{2}$ W is provided with twin tracks, giving a total playing time of 3 hours by using 'double play tape'. Will make recordings from microphone, radio or gramophone records, and an electronic recording level indicator is included. There is automatic erasure when recording, and an extremely simple operation with interlock to prevent accidental erasure. The single tape speed is $3\frac{1}{2}$ ips and reel diameter $5\frac{1}{2}$ ". Included with this model is one reel of tape and take-up spool and a crystal microphone. The cabinet is attractively covered in plastic leathercloth over moulded wood fibre, and weighs only $15\frac{1}{2}$ lb.

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- ★ Single speed: $3\frac{1}{2}$ ips
- ★ Twin tracks—total playing time 3 hours (using double play tape)
- ★ Automatic erasure when recording
- ★ Fitted with tone control
- ★ New type cathode ray recording level indicator
- ★ Extremely simple operation with interlock to prevent accidental erasure

PRICE 28 gns.



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ES/R/88



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Hand Made . . .

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

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

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

TECHNICAL SPECIFICATION

The R40
 $3\frac{1}{2}$ ips 60—8,000 \pm 3db
 $7\frac{1}{2}$ ips 50—15,000 \pm 3db
 15 ips 40—20,000 \pm 3db
 (signal-noise ratio at $7\frac{1}{2}$ ips—48db)
 Separate record amplifier
 2 per cent total harmonic distortion
 at peak recording level 1 kc/s.
 Push-pull bias erase oscillator for low
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 Separate bass and treble controls \pm 15db
 at 14 kc/s—15db at 40 c/s
 Supplied complete with Acos 39/1 mic. stand.
 and 1,200' P.V.C. tape



MODEL R30/R40

MODELS

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

HOW MANY CYCLES?

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

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

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

A more plausible answer takes into account that at $7\frac{1}{2}$ in. per second at 7,500c/s a distance of 0.0001 in. between tape and Playback Head results

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

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

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

Finally to see if you really need all those practically inaudible cycles try recording on a really good machine* at $7\frac{1}{2}$ in. per sec. and then at 15 in. per sec. to compare the difference.

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

Mr.....

Fully illustrated literature available on request to—

REPS (TAPE RECORDERS) LTD.

118 Park Road North, South Acton, London, W.3

Phone: ACOrn 4141

the TAPE RECORDER

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 Telephone - - - - - MUSEum 3967 to 3969

EDITORIAL

A HAPPY CHRISTMAS to you, Sir, or Madam, wherever you may be! And if it is a tape recorder that you are wanting, may it turn up in your list of presents, in good time for the seasonal festivities! On the other hand, if you are stumped for an idea for presents to give, don't forget that any tape recorder owner will always be more than grateful for a spool of tape.

It is very interesting to note this new addition to the list of acceptable gifts, for it represents a landmark in the order of domestic entertainment. At the turn of the century, the camera and the phonograph came into the home. In the 1920's aërials sprouted in back gardens, and we had radio. In the 1930's came television. Now we have tape. But tape has its own special significance, and it can be compared only with the photographic print. Until photography reached the multitudes, our records of the past depended upon written descriptions; but the family albums of today already store up pictorial memories extending backwards over three generations; and, in the homes of the few who bought the earliest tape recorders, there are now sound recordings of young voices and happy occasions which were made over ten years ago. The marriage of the two media—sound and film—has recently brought an even more wonderful form of record for those who have been able to explore its possibilities.

This Christmas, it is certain, will see a really large number of tape recorders on the list of presents. With many new and cheaper models on the market, and with a new range of battery operated portables available, the interest in tape is increasing at an enormous rate. The reason for this is obvious. The tape recorder has its own particular appeal for almost every age group, and its application in almost every trade and industry. On the one hand, in its most elaborate form, it is the new tool for scientific research: at the other extreme it is the modern medium for home entertainment. It does equally valuable work on the office desk, as a dictating machine, and in educational institutions for speech therapy. And the further one thinks, the more limitless its possible uses appear to be. In daily use are the giant recorders with which complete television programmes (pictures and sound) can be taped and stored. These instruments cost many thousands of pounds, and their racks of electronic equipment are formidably complex. But they will not always remain in that price bracket, and they are bound to come down in size, as in price. It is certainly most unlikely that a "home recorder" for TV pictures will appear on the market in the £50 range for many years to come! Nevertheless, it is fairly safe to prophesy that there *will be* reasonably compact TV-type recorders for the home in the foreseeable future. The back-room boys are working on the problem now, and they have been for a couple of years. Far more likely to come fairly soon is the really small, pocket-sized transistorised miniature. That, too, is receiving energetic attention in the laboratories. How soon these things will come, and how much they will cost, would be foolhardy to guess; but they will come, and sooner than many of us expect, possibly for Christmas presents before we are all that much older! And on that note let us come back to earth and repeat what we said at the beginning of this column:

A Happy Christmas to you, wherever you may be!

DECEMBER - - - - - 1959

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COVER PICTURE

IT isn't that Santa intends to ignore the Christmas lists forwarded to him by the time-honoured methods—via the G.P.O. and the living-room chimney—but requests for presents recorded on tape can be more conveniently checked off back at the North Pole, and loaded on the sledge suitably wrapped and labelled. Our photographer, Tina Tranter, found that even the faintest voices can be recorded faithfully, and if the accompanying parent stands by near enough to "monitor" the recording, we feel sure that Christmas morning will find all the right presents safely packed in the right (and left?) stockings.

NEXT MONTH

OUR field trials of battery portable recorders continue next month with the Minivox, manufactured by the Challen Instrument Company. We launch also a series of articles by James Moir on *Testing Tape Recorders*, which will describe his methods of reviewing recorders, and at the same time explain in simple terms the various points referred to in manufacturers' specifications. A. Tutchings uses the beginner's recording kit to investigate the quality of recording at different speeds, and the *Tape Recorder Workbench* article outlines the *correct* methods of recording from radio, TV, and record players. Look out too for all our regular news and reports of tape activities *Here, There and Everywhere*, and as "*The Tape Recorder*" continues to be in short supply, we suggest you place an early order with your newsagent or tape dealer.

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).

• A new standard of quality, by which
other machines will be judged •

Angus McKenzie in TAPE RECORDING AND HI-FI MAGAZINE



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

This is the enthusiastic opinion of an expert, an independent reviewer, after thoroughly testing the Simon SP4. Throughout the Hi-Fi world, this superb new tape recorder, with its combination of high performance and range of exclusive features, is sparking off similar praise from those who have seen and heard it. Look at this list of star features—then come and see it for yourself at your nearest dealer—try it, test it and you too will join the crowds of Simon enthusiasts.

- * SIMON AUTOMATIC DECK fully 'push-button controlled'.
- AUTOMATIC TAPE REVERSAL without touching controls.
- 3-WAY MIXING FACILITIES on both record and playback.
- BASS AND TREBLE LIFT AND CUT with independent controls.
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- 'PIN-POINT' MODULATION with cathode ray magic eye.

simon SP. 4

incorporating the new Simon fully automatic tape deck

and you can replay stereo, too
with the **SIMON STEREO ADAPTOR**

You can convert the SP4 for stereo at any time—and enjoy the brilliant realism in reproduction which only SP4 performance plus stereo can give. The Simon Stereo Adaptor replays pre-recorded tapes to CCIR specification and has full tone control as in SP4. Complete with amplifier and bass and treble speakers matching those in the SP4, price 49 gns.

Your Simon Dealer **95** GNS
would be pleased to arrange H.P. terms

Choose Simon for Sound

Write for leaflet (N10) to:

SIMON SOUND SERVICE LTD.

46-50 George Street, Portman Square, London W.1

TECHNIQUES IN EDITING

IN a series of articles some time ago, I explained with the aid of photographs the mechanics of tape editing—where to mark the tape and the various methods of cutting and jointing. In the two articles which follow, I shall be discussing how to identify the exact cutting points, and the various techniques used in editing. Firstly, however, let us consider how to locate the exact cutting points on the various types of domestic recorders in use.

Finding the Exact Cutting Point

When playing a tape to select the editing points, it is virtually impossible to stop the machine exactly at the point where you wish to make your cuts. It is obvious that a more accurate method of location is necessary to permit fine cutting, e.g. on music.

The way in which the exact cutting point is found depends largely upon the type of recorder being used. If it is of the type which requires two operations for each function, i.e. one switch to select the replay or record condition, and another to operate the motors and set the tape in motion, then you will find that with the motors switched off, it is possible to pull the tape manually over the heads and still be able to hear the output.

Useful pause controls

Other machines possess a "pause" control which, on operation, disengages the capstan from the drive pulley. This makes it possible to control the motion of the tape by hand and still be able to hear it.

In the case of the first type of machine, the procedure for finding the cutting point would be to play the tape, and stop the machine (switch off the motors), as near to the point as possible. The tape should then be pulled backwards and forwards across the replay head by rotating the spools by hand, until the exact point is located.

In the case of the second type of machine, the procedure is similar except that, instead of switching off the motors, the tape is stopped as near as possible to the cutting point by operation of the "pause" control. Still holding this control, the tape should be pulled backwards and forwards across the replay head as described before. With this type of machine, the accuracy of the marking can be instantly checked by releasing the "pause" control as soon as the mark has been made. The tape will run up to speed immediately, and thus the first sound following the cutting point will be easily recognisable.

Having located the exact cutting point and marked it, the tape is lifted from the guides and placed in the editing block ready for cutting. If the "pause" control has been used to locate the point, then the motors should be stopped by depressing the "stop" key before attempting to lift out the tape.

Editing Techniques

Each editing session involves its own peculiar problems and there are, of course, various methods of approaching these. The following methods are outlined to act as a guide to quick and efficient operation.

Firstly, basic editing—the removal of the odd word, cough, or mistake. As a general rule, in order to maintain continuity, you should make the cut from the beginning of a word at the start of an edit to the beginning of the word following the edit. For example, in



Accurate marking is essential, and when the replay head is inaccessible you should find a fixed offset point, e.g. a tape guide as shown. (BBC Photo).

the following sentence the words "as I said before" are to be edited out.

"In the meantime, /as I said before,/ I shall continue to practise."

In this sentence, the cutting points would be the beginning of "as" and the beginning of "I." By adopting this method, continuity and regular tempo of speech can be maintained. Cutting from the end of a word to the end of another word could equally be used, but from the point of view of ease of identification the beginning of a word is preferable.

Having identified the word which is to be cut, the easiest way of finding the exact cutting point is by mentally breaking the word into phonetic sounds. In this sentence, for example, "And, after this, I went back to the ground . . .", assume that "after this" is to be cut. Reading this sentence will indicate that the gap between "and" and "after" will be almost non-existent. To find the beginning of "after" one would first identify the end of "and"—the sound to look for being "d". Having located this, the next sound after it would be the beginning of "after". At the end of the cut, assume that "this" and "I" are run together, i.e. there is no perceptible gap between them. Having identified "this" it will be seen that the point at which the soft sound "s" becomes the hard sound of "I" is the cutting point.

Hawkward Haitches

Other occasions may call for the removal of an unwanted letter. Probably the most common of these is the unwanted "h", e.g. "honour" where the "h" should be silent, or the unintentional addition of "h" to "attribute" (hattribute). Here again the cutting points will occur where the soft (rather like an exhalation of breath) sound of the "h" becomes the hard sound of "o" or "a". Remember that in each case an immediate check on the accuracy of the marking can be made as described before.

It will be seen from this that removal or transposition of syllables or sounds can easily be effected. A dropped "h" can be added, the singular turned into plural and negatives into positives, and so on.

Pauses

There are, of course, times when the pause which follows the material preceding a cut is inadequate. It might be an edit made half-way through a paragraph to the beginning of a subsequent paragraph. In this case, the first cut will be followed by only a sentence pause, whereas the pause required is much longer. The pause should, therefore, be obtained from the start of the subsequent paragraph. Do not use a piece of completely blank tape if there is any suggestion of background atmosphere throughout the remainder of the material, since the cut would become most obvious.

And whilst on the subject of atmosphere, if one is forced by circumstance to cut from either high background noise to low or vice versa, always leave the atmosphere following the material preceding the first cut, and make the second cut as close as possible to the first word following the edit—this will create the impression of a steep fade in or out of atmosphere on the first words following the cut. Whilst not perfect, it is preferable to the opposite way of doing it.

Another awkward problem encountered in speech editing is that of inflection. This, and the editing of repetitive effects and music, I shall be dealing with in the second of these articles.

LONDON AREA—TAPE RECORDERS AND HI-FI
Stocking Agents: Ferrograph, Vortexion, Leak, Quad, etc.

NUSOUND

RECORDING CO., 3-8 Brigstock Parade,
London Road, Thornton Heath, Surrey
TAPE RECORDER SPECIALISTS

Tel: THO 7609
(Opposite Thornton Heath L.T. Bus Garage—1st floor)



A student of the Battersea College of Technology makes a recording during their recent tour of Egypt, studying social, industrial, agricultural, tourist and educational progress since the revolution. The party were the guests of President Nasser. The recorder is a Grundig "Cub".

Almost Unbelievable, but...

FOR various obvious reasons, "no names, no packdrill" here; and if you don't believe it, nor did we at first; but it's true! A family had ideas for an Italian holiday, and thought it would be wonderful to arrive in the land of sunshine with the added advantage of a basic understanding of the lingo. So, being the owners of an old but quite serviceable tape recorder, they bought a language course.

HERE AND THERE AND EVERYWHERE

Now anyone who has listened to the radio or gramophone knows well that the Italian language contains such words as "Si : Niente : Arrivaderci", etc., and whereas this industrious couple made definite but difficult phonetic progress with lots of strange-sounding material, they were forced to give up after an hour or so. No familiar words. No useful, explanatory English—in fact, *molto niente*. At first puzzled, and then angry, they telephoned the address from which they had acquired the tape.

The tape was O.K. But they were playing it on one of those old machines which run from right to left.

An Offer To Help

A kind offer to help the blind comes to us, via an intermediary, from **John Thompson, Dale Nook, Birch Dale, Appleton, Stockton Heath, Nr. Warrington, Lancs.**

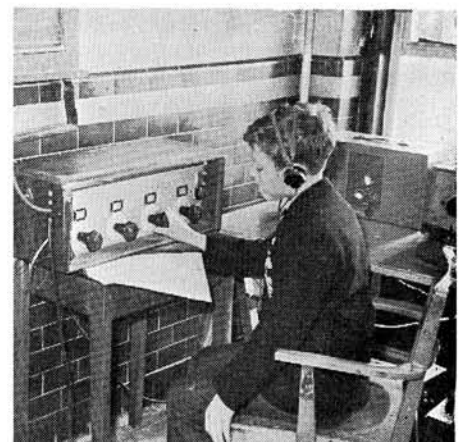
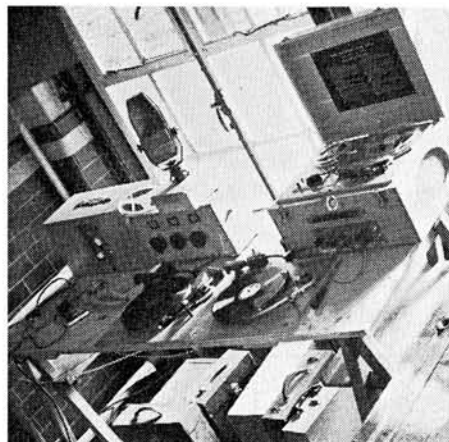
John Thompson, aged 15, has suffered from muscular dystrophy since birth, and because of this handicap he is unable to write with comfort—and nor has he the muscular power to depress the selection buttons on a tape recorder. However, seeing a tape recorder as a wonderful means for expression and occupation, he approached his local dealer, who successfully and simply modified a well-known make for him. This has enabled John to operate the instrument. He is finding it a great help for taking notes, and has just started to tackle his GCE examinations.

Handicapped himself, he is very anxious to help other handicapped people, and he is willing to record anything directly on to tape for the benefit of any blind person who owns a similar tape recorder—i.e. one which operates at $3\frac{1}{2}$ i/s on international track.

Thanks for the kind offer, John; and the best of luck with the exams!

Tape and Touch-downs

News of yet another unexpected use for a tape recorder comes from Scarborough. Mr. Tristram Yellin, who coaches the Scarborough R.U.E.C., had novel ideas for the improved results from the team. Ideally, he thought, a cine film of a match should be projected after defeat, so enabling the most useful step-by-step post-mortem to be carried out. Film was obviously "out", of course, because of the prohibitive cost which would have been involved. Instead, he records the play of a match



Once again we are indebted to Graham Jones, a master at Temple County Secondary School, Rochester, for letting us see something of the busy part a tape recorder can play in school life. The above photographs show (left to right) (a) two boys locating exact cues before playing in discs; (b) a general view of the gram desk, with its intercom or "talk back" microphone, and Clarke & Smith recorder; (c) operating the 4-channel mixer, while monitoring on headphones (see also facing page).

HERE AND THERE AND EVERYWHERE *cont.*

with his commentary. Then, later, he replays the tape and points out the faults and errors made by individual members of the team.

However good one's memory, no one can carry all the intricate detail of a game in mind; but as the tape is played, not only do the facts re-appear chronologically, but the incidents serve as useful memory-prodders.

Carrying his idea a stage further, Tristram Yellin now thinks it would be a good idea to employ a second recorder, so that he could tape the comments and discussions which occur between players when they are listening to the playbacks!

More "Music on Tape"

We have had plenty to say about the shortage of recorded tapes to suit home recorders, and we have certainly had to answer many letters from readers on this same subject; so here, for a change, is news of a new label, "Music on Tape". The suppliers are: **Colrich Audio Limited, 92, Buckingham Palace Road, London, S.W.1.**, and dealers are also invited to note that supplies are available from that address.

Four titles are offered. *Salute to Glenn Miller*: *Salute to Tommy Dorsey*; *Dorita Y Pepe*; *Dis Disley and his Jazz Group*. The retail prices are as follows: Mono, 3½ i/s, 32s.; 7½ i/s, 42s.; Stereo, 7½ i/s, £4.

Tape Recorder Service Co.—New Showroom

The Tape Recorder Service Co., of Bromley, Kent, inform us that their new showroom is now complete, and will be opened on November 28th. The address, for your notebook, is **95, Beckenham Lane, Shortlands, Bromley, Kent**. One minute from Shortlands station.

Recording Devices Limited—New Premises

Stuzzi distributors for the United Kingdom, Recording Devices Ltd., who are also manufacturers of the "Mannequin" tape recorder, have now moved to larger premises. The new address is **44, Southern Row, Kensington, London, W.10**. The new telephone number is LADbroke 4775.



The decorative display of Scotch Brand (3Ms) Tape is now a familiar sight at Audio Fairs and Exhibitions. The equally decorative visitor in the above photograph is Marion Ryan

Stolen Goods!

Wyndson Recording Co. Ltd., inform us that a Wyndson Viscount was recently stolen from the stock of Mainsets Ltd., South Harrow. So, if you are offered one privately, watch for the serial number. It is 7551.

...And the Burglars Fled!

With acknowledgements to "Readers Digest" we report this news item from Chicago (alas, not South Harrow), where burglars broke into a shop. As they forced the window a voice called out: "Good evening gentlemen. May I remind you that this store is electronically guarded?" Then the loudspeakers let loose with cries of "Help! Burglars! Police! Police!". The burglars fled.

And from the same source we acknowledge details of the following New York experiment, where recorded tape has been



The Rochester tape recording equipment comprises the School's Clarke & Smith tape recorder, and mixers, microphones, etc. acquired from various surplus sources, including the BBC. Assembling of the pieces, and wiring of the cue circuits, etc., is largely carried out by the boys themselves. The above photographs show (a) tone controls being adjusted; (b) Graham Jones demonstrating tape splicing, and (c) an ingenious method of distorting speech by placing a tape box on the back of a ribbon microphone.



Bill Tilcock, whose climbing exploits are described on the opposite page, is seen here at sea level with his wife who is also an active member of the R.A.T.R.S.

what others are doing in the tape world

NEWS FROM THE CLUBS

tried out to help road safety. Jay walkers about to step out for possible disaster are halted by a voice from nowhere: "It is too late to cross safely. Kindly wait for the green light!"

How to Splice Tape

Since the publication of our booklet: *How to Splice Tape*, we have received a pile of letters from readers who have bought the book, all asking the same question . . . *Where can I buy an editing block like that illustrated?* We have forwarded these enquiries to the manufacturers, **Romagna Reproducers Ltd., 2, Sarnesfield Road, Enfield, Middlesex**, and we recommend our readers to write to this address, specifying the *Romagna Editing Block*. The price is 7s. 6d. We are asked by Romagna to notify readers that, should the present demand exhaust their present stocks, adequate supplies will again be available before Christmas.

New Branch of "Lasky's"

Lasky's Radio, of 42 Tottenham Court Road, London, have now opened additional and larger premises at **207 Edgware Road, London, W.2**. Telephone number, PADdington 3271. At this new address Lasky's maintains a complete stock of high fidelity equipment, tape recorders and accessories, together with their full range of components, valves, etc.

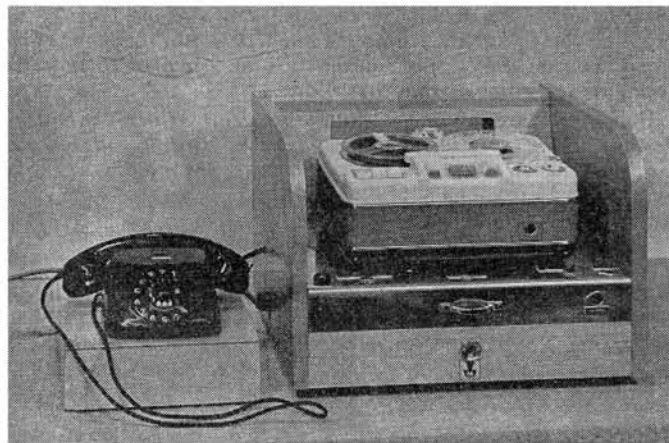
A GROUP of enthusiasts are planning to form the **Ilford, Dagenham and District Tape Recorder Club**. They intend holding meetings at the White Hart Hotel, Green Lane, Ilford, on the first Tuesday of each month. The acting secretary will be Mr. A. E. Jones, 95 Longbridge Road, Dagenham, to whom all applications should be addressed.

The **Ipswich Tape Recording Club** have been very active in making external recordings, the most recent being a visit to the Gaumont Theatre to record interviews with the cast of the Marty Wilde Show. Club members manned the Public Address system outside the Town Hall when speeches were made to appeal for funds for the World Refugee Year; these were all recorded. Future events include a return visit to the Gaumont to interview the manager on the occasion of the theatre's 30th birthday and, on the 5th December, a demonstration by Mr. J. O. Clover of the Grundig Stereo 60 recorder.

At the last meeting of the **London Tape Recording Club**, Mr. Frank McManus took the chair and welcomed Mr. Parrington of Walter Instruments Ltd. Mr. Parrington demonstrated his firm's 101, 303 and 505 recorders, and a prototype column loudspeaker (not yet on the market) which greatly impressed members. Mem-

bers questions were answered by Mr. Parrington after the demonstration.

During the second half of the meeting, Mr. Ken Blake played back a recording he made in the form of a documentary on London taxi cabs. Using a Vortexion with a converter power unit, Mr. Blake spent 90 hours touring London interviewing drivers and maintenance men, and asking members of the public for their opinions on London taxis. Perhaps the most interesting "session" was in a well-known gathering place for cabbies—a cafe in Lambeth where the drivers compare stories of the unusual routes and odd customers they had carried. Other items on the tape were recorded in the control room of a radiocab company.



The recording of telephone conversations—domestic as well as business—is becoming increasingly popular. The attractive arrangement shown incorporates a Magnetophon KL65X recorder in a dust-proof cabinet alongside a telephone with induction coil permanently in position.

The Technical Group of the **Millom and District Tape Recording Society** recently made an excellent recording of the opening of Millom's new Comprehensive School by Princess Alexandra. Equipment comprised a ribbon microphone for speeches, and condenser microphone added for choir balance. They were fed through a Grundig mixer to a TK20. Output was fed to the school recorder to provide them with a personal copy of the recording, and to the school amplifier system to allow pupils to follow the ceremony. Members described the event, both technically and socially, as a "wonderful experience". The Society now uses the main lecture room at this school for all their meetings.

Mr. D. E. Wearing of the **Rugby Amateur Tape Recording Society** showed a number of colour slides, taken in Switzerland, with taped commentary at their last meeting. We are told this was most professionally produced and much enjoyed by his audience.

Miss Joan Ray-Linger, a local amateur theatrical enthusiast, has made a start on casting for the club play, "His Excellency" by Dorothy and Campbell Christie. Taking part will be nine males and two females—not forgetting the recording staff, of course. Miss Ray-Linger is not a member of the RATRS as yet,

what others are doing in the tape world



A popular figure in the amateur tape recording world, Mike Brown, is known by many enthusiasts outside the Rugby Amateur Tape Recording Society, of which he is at present the secretary

but we shall not be surprised to hear that she has joined this very go ahead club.

Not only is the club going ahead—it's going upwards too! 800 ft. up in fact. Here's an extract from a recording made by Bill Tilcock at the top of one of the Rugby Radio Station masts. Toting a Stuzzi Magonette, Mr. Tilcock climbed the 34 ft. vertical ladder from ground level to the winch-operated lift which goes up to 805 ft. Going up!

B.T. "It's better to come up here in the summer!"

Guide "Yes on a clear day you can see Coventry . . . you'll see the M.I. in a minute . . ." (one blast from the guide's whistle signifies that the cage has arrived at the top of its run, 805 ft.).

B.T. "What have you taken the safety bar off for? I don't particularly want to get out—I'm quite content here".

Guide "It's quite safe—you go up the ladder for about 20 ft. and then you're right at the top!"

B.T. "No . . . I don't think so—the wind is catching the mike a wee bit".

Guide "Come and see the M.I."

B.T. "Raining a bit isn't it . . . by gum it's blowy. Here, this bar's a bit greasy to hang on to".

Guide "Yes, she's all greased up for winter. There's the M.I.! Now, here's the ladder you go up, you pass through that little hole and out on the platform—it's got a handrail".

B.T. "No, I don't think I'll bother today".

Guide "When you're on the ground, you'd think these aerials were pretty taut wouldn't you—but you see the dip they've got in them? Peep round this corner—just put your head round this corner".

B.T. "Looks quite impressive doesn't it? Someone said I should have brought a camera, but I've got quite enough to do hanging on and holding this tape recorder".

Going down:

B.T. "Are these the highest masts in England?"

Guide "Yes, they're 820 ft. to the top and have a 10 ft. sway. Good job you didn't go up earlier as the transmitter would have been working then and things get a bit hot".

Back on terra firma, club members made a tour of the Rugby Radio Station (with permission of the G.P.O. Telecommunications External Executive) and interviewed the engineer in chief and some of his staff. Recordings were made of the call signs MSF and GBR, sound signals and speech being relayed and transmitted through the station.



The ubiquitous tape recorder can now be found in very remote corners of the world. This Telefunken photograph shows a Magnetophon KL65 recorder perched on Eduard Edlitzberger's motorcycle in a small village near the Andean foothills in the Argentine.

NEWS and PICTURES



(Edinburgh Evening News photo)

An ingenious "breadboard" system driving a continuous loop of tape was used recently to broadcast a mobile appeal to save water. The machine is a Grundig "Cub", and the campaign was a combined operation by Edinburgh Water Department, the City Police, and the Transport Department.

The Walthamstow and District Tape Recording Society is now eight months old and has become well established. Its fortnightly meetings have been attended regularly by a very keen group who, if rather small in numbers are not short of ideas. This Society is fortunate in having a number of talented members; apart from some very capable technicians, they have a writer and a journalist, Mr. Maurice Dudley, who is responsible for press reports of the activities of the Society. It was on Mr. Dudley's initiative that the Connaught hospital service was started. The first hospital request programme was broadcast over the hospital circuit on the afternoon of November 7th, Leonard Chanter was the compere. Mr. Chanter is now building a control panel for permanent installation so that members can use their various machines without difficulty. "Danecourt House" is to remain the headquarters of the Society.

Recent meetings have included a visit from the Secretary of the Federation of British Tape Recording Clubs; a demonstration by a blind member, Don Couper, of the ways in which he uses his recorders; and a preliminary trial for the proposed play. The play is to be developed from a short story written by Mrs. Burnett, a member of the Society. Subject to the agreement of the organisers, the Society will operate a "Record your Voice" stand at the Sidney Burnell Secondary Modern School, as part of a bazaar

organised in aid of World Refugee Year. Enquiries about the Society may be made to the Secretary, Mr. J. A. Wells, 178 Selwyn Avenue, Highams Park, London, E.4., and new members are welcomed. Meetings are held every other Friday.

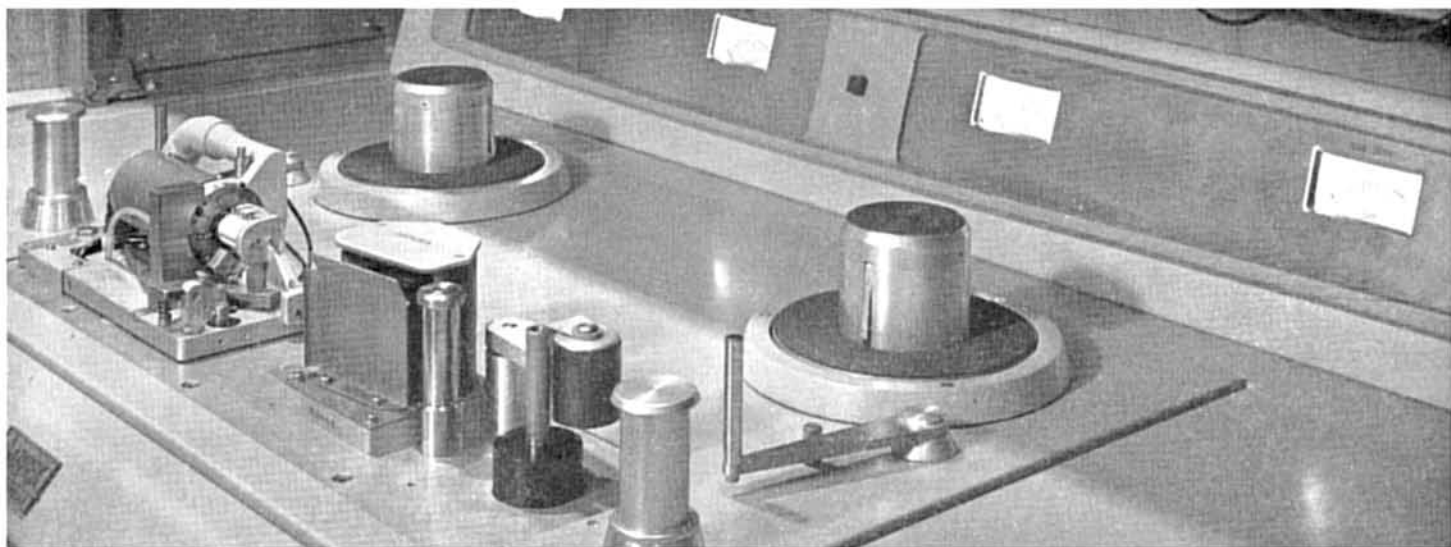
* * *

We are told that when three members of the **Catford Tape Recording Club**, armed with a Stuzzi Magnette apiece, went into the street to make a recording of Catford at night, the results were "very amusing". (We wish we had the details!) At their next meeting, the members will be engaged in making a humorous tape. The subject: Prisons. Somebody down in Catford must be a Charles Adams fan. Future meetings will include a talk and demonstration of pre-recorded tapes by Saga Records Ltd., a recorder demonstration by Fi-Cord Ltd., and an equipment demonstration by Brenell Engineering Co. Ltd. Membership of the Catford Tape Recording Club now stands at twenty-eight with two overseas members in the armed forces.

Last month we mentioned that the **Southall Community Association** had inaugurated a Tape Recording Group. Mr. Hallett, the secretary, telephoned us a day or two ago to pass on news of its development and activities. We were most impressed by the good work this group is doing for the community in providing entertainment for old people and hospitals. So far they have recorded a play and the Southall Operatic Society's production of "The Gypsy Baron". Other recordings which are to be made available for hospitals are of football matches at the Southall Football Club, and local church services. One rather original piece of entertainment planned for the Southall Old People's Association is an amusing dialogue between two tape recorders; the script for this was written by Mr. Hallett. He asks us to mention that he is keen to contact other people in the country who are engaged in similar activities as this group and hopes to set up an exchange of ideas and possibly tapes for the work he is doing.

The "Robophone", manufactured by Automaton Telephones (London) Ltd., will not only take incoming calls, and record them for reproduction at any convenient time, but actually answers with a suitable pre-recorded message explaining your absence and inviting the caller to "go ahead and record".





Magnetic tape is now the generally accepted method of recording television programmes—vision, synchronising pulses, and sound. The above photograph is a close-up of the Ampex Videotape Recorder, assembled in this country by Rank Cintel. The 2-inch wide tape passes over (from left to right) the rotating video head, with its pressurised concave head and stationary control track head at the base, sound erase head, cue record/replay head, sound record/replay head, drive capstan and pressure roller.

Mr. John Penman, Secretary of the **Edinburgh** Tape Recorder Club, has sent us a very smartly printed syllabus of meetings to be held up to October 1960. Obviously a great deal of thought has gone into the preparation of this, and for the benefit of other clubs which may care to take this as a guide, we reproduce the list of events here:—*Jan. 5th*—Sounds and voices quiz. Auction of members' spare equipment and accessories. *Jan. 17th*—Tape editing competition. *Feb. 2nd*—Open night (General public invited). *Feb. 21st*—Mikes. *Mar. 3rd*—Sound Effects. *Mar. 20th*—“3 minutes or else” competition, penalty 1s. *Apr. 5th*—Cine “sync” demonstration. *Apr. 17th*—We make a tape. *May 3rd*—History of tape recording. *May 15th*—We experiment with stereo. *June 7th*—Strange to your ears. *June 15th*—Team quiz. *July 17th*—Club night news and views from other clubs. *Aug. 2nd*—Tuners. *Aug. 21st*—Cleaning and maintenance of tape recorders.

that a check can be made on progress. Comparison of these sounds contributes towards methods of treatment and training.

Mr. F. C. Guzeley has now taken over the Sightless Section of the **Voicespondence Club** from Mr. John St. Hughes. All communications should be addressed to Mr. Guzeley at 12 Bromley Road, Beckenham, Kent.

The **Staffordshire** tape recorder society now has 20 enthusiastic members and is holding fortnightly meetings. Subscription rates have been fixed at 1 guinea for ordinary members, 17s. 6d. for 18-21 yrs. and 10s. 6d. for the under 18's. The Society has started a public message service details of which may be obtained from the secretary. At the last meeting on Nov. 11th. Kay's Business Services of Stafford demonstrated a complete range of Grundig recorders including dictating machines and the TK60 stereo recorder. Mr. Fitch of Beam Echo Ltd. demonstrated Avantic amplifiers and speakers using stereo tapes and discs. The Society is still looking for a permanent headquarters and the secretary would be very pleased to hear from anyone who owns or knows of suitable premises. The Secretary is Mrs. M. J. Tasker, 7 Creswell Grove, Stafford.

At a well-attended meeting on November 16th, the **Crawley and Sussex** Tape Recording Club had a visit from Mr. Lovegrove of Fi-Cord who demonstrated the Fi-Cord recorder. With the aid of two technical members, Mr. J. Burtenshaw and Mr. F. Fox, Mr. Lovegrove also demonstrated the Eumig P.8. cine projector with a Brenell Mk V. A series of colour films were shown including shots of Trooping the Colour, Motor Racing, and a bowling alley in Switzerland; the accompanying sound had been recorded on the Fi-Cord and excellent synchronisation was obtained in the playback.

“Scotch” Brand have devised a gay, seasonal wrapper for their new Accessory Kit, and dealers will find that the sleeve can easily be removed after the Festive Season is over.



((ساوند))

بالاترین دستگاه ضبط صدا ساخت انگلستان

حساس - دقیق - زیبا و محکم

باسه سرعت ۱۵ - ۷.۵ و ۳.۳
/ یادگیرنده انوماتیک بدون جابجا کردن نوار از دو طرف ضبط و پخش میکند.
/ بانوار ۱۸۰۰ فوت سه ساعته و نوار اضافی بشکل یک چمدان ظریف
کله نوارهای ضبط شده را بطرز عالی پخش میکند.
/ باریق ۲۰۰ الی ۳۵۰ ولت کار میکند
کابل میکروفون جیب ضبط از گوینده (قابل مقاومت در هوای گرم)
کابل مخصوص جیب ضبط مستقیم از رادیو
برای خرید و کسب اطلاع میتوانید به تجارتخانه احمد حاجی علی کبی -
اوهان سرای شمالی - مراجعه فرمائید.
۱۷۰۳۸۱



عالیترین دستگاه ضبط صدا
ساخت انگلستان

This advertisement cutting was sent to us by a reader in Teheran. The recorder, presumably delivered by slow camel, is a “Sound 555”, now out of production.

Sept. 6th—Slide show of Edinburgh with recorded commentary and sound effects (prepared by members to send abroad). *Sept. 18th*—Sound picture competition. *Oct 4th*—Annual General Meeting.

The leaflet carries advertisements for half a dozen local dealers in tape equipment and ancillary goods, which we assume was a considerable help towards printing costs.

At their November 15th. meeting, the club was visited by a Miss Cooper who is speech therapist to Professor Norman Ditt's Brain Injury Unit. She gave a most interesting talk on the use of tape recorders in helping patients towards coherent speech. Recordings of the sounds made by patients are of great help towards effecting a cure.

Apart from adults robbed of coherent speech by a brain injury, the sounds made by maladjusted children, too, are recorded so

TAPE RECORDERS

Tape Recorders

tape recorders

WE MAKE THEM, SELL THEM, SERVICE THEM

To all of you and especially our customers of this past year, we extend the most sincere greetings and wish you a very happy Christmas and a prosperous New Year. We do hope you will enjoy yourselves, and enjoy the use of your recorders.

At our new showrooms you can see, hear, inspect and purchase nothing but tape recorders and their accessories. Don't delay! Don't leave it till it's too late. See them now, hear them now, and place your order now. Low deposits, very easy terms, you won't be badgered to buy, you can ask for advice and information without any obligation. Stocks of some models are already running very low, so make sure that you are in good time for Christmas.

If you cannot visit us at our new address do send for our brochures and price lists. Our mail order dept. will do all it can to despatch your recorder in good time.

As toothache on a bank holiday is a common occurrence, so have we found that a recorder breakdown is also inevitable on THE day. No matter, if you can bring it to us before 12 noon on Christmas Day, we will be pleased to help you whether it was purchased from us or not. For this purpose, a member of our staff has Volunteered?!* to assist.

THE TAPE RECORDER SERVICE CO.

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Telephone: Ravensbourne 6119

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

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

Name

Address

.....

By Eric Simms

NATURE'S LIBRARY OF SOUND

PART 7 — AN INVADER FROM THE CONTINENT

IT is always a matter for rejoicing among bird-watchers when a lost British bird returns or a newcomer breeds for the first time in the British Isles. After an absence as a breeding species for more than a century the avocet nested in East Anglia in 1947 and is now well-established at Havergate Island in Suffolk during the summer. Another wader—the black-tailed godwit—has also returned to breed, and earlier this year the magnificent fish-catching osprey nested successfully in Scotland and three young birds were known to have been reared. Twice this summer I was able to see the hen osprey feeding the young in the nest.

Nevertheless, the arrival of an entirely new breeding bird is a matter for even greater excitement. In a Sussex sand-pit in 1955 two pairs of fairy-like bee-eaters safely reared broods of three and four young; this was the first successful breeding record of this species in the British Isles. There is also the fascinating story of the welcome invasion of England by another bird. Unlike the bee-eater this one was small and unspectacular; it, too, was a very rare visitor to this country. Then, just before the last war, it made its contribution to bird-watching history.

Rare visitors indeed

One early June afternoon in 1938 three bird-watchers were sitting on the bank of a reservoir at Tring in Hertfordshire when they suddenly became aware of a bird-call that was strange to them. It was a clear, high-pitched "pee-oo" that first drew their attention to two small wading birds standing by the edge of the reservoir. At first glance the two strangers looked rather like ringed plovers which are common enough on many sandy shores, pebbly beaches and some inland sandy wastes. The three watchers soon realised that there were some important differences. Each bird had a bright, yellow ring round the eye, a black bill and, in flight, no wing bar. The call, too, was unlike that of the common ringed plover.

The three watchers realised that these strange birds were little ringed plovers—a species which although it had nested in Holland, France and other European countries had only been seen prior to this about a dozen times in Britain and only twice before in the Twentieth Century. These records had quite certainly been of birds that had strayed from their normal migration route between their Continental breeding grounds and their winter home in Africa or India.

A new breeding bird

Most of these wanderers had fallen to the man with a shot-gun. In 1938 there was a new climate of opinion and the pair at Tring was not disturbed. A week after the initial discovery a nest was found—a shallow scoop in the ground with four eggs. For the twenty six days of the incubation an almost continuous watch was kept by bird-lovers—eventually three eggs hatched and Britain had acquired a new breeding bird. No one thought that the event would be repeated but six years later more birds returned to Tring and a pair nested at a Middlesex gravel-pit. From then onwards these little wading birds began to colonise new districts. The spread was gradual and this provided a chance for a careful study of its expansion and the adaptation of a bird to a new country.

This study was undertaken by John Parrinder and in a sound broadcast that he made with me in the autumn of 1951 he described how the London Natural History Society made a survey, partly from the ground and partly from the air, of the gravel-pits around London. By 1947 the number of breeding



Eric Simms adjusts the reflector on the gravel bed of the reservoir to record the little ringed plover. (Photo by Eric Hosking).

pairs had risen to a dozen and birds began to nest on the vast gravel floors of two great reservoirs then under construction—the King George VI at Staines and the William Girling at Chingford.

When a bird is rare and its status uncertain it is foolish in the extreme to do anything which may disturb it. Little ringed plovers were surprisingly tolerant both of men and machinery, and by 1951 it was obvious that their range and numbers were assured; it seemed a good opportunity to try and record their voices for the first time at Chingford. Through the generosity of the Metropolitan Water Board I was given facilities to make recordings there, and John Parrinder agreed to help; for years he had carefully guarded the little ringed plovers' secret breeding ground. In May, 1951, we climbed the steps which led up the outside section of the reservoir's wall and so on to the top ridge. The view that revealed itself as I mounted the ridge was unforgettable. Below me stretched into the distance a concrete shell which lined the wall and bore on its broad back a road that ran right round the perimeter of the reservoir. Three hundred acres of gravel lay in the bottom of this man-made saucer with occasional shallow pools and scrubby clumps of sedge and sallow.

Preparations for recording

In the distance redshank and lapwing called, and skylarks poured out continuous cascades of song. We even heard the faint high "pee-oo" of a little ringed plover, but although we looked at many little scrapes made by the birds we found none with eggs; it was soon obvious that we were too early and would have to come back later in the month. On the 31st of May we saw at least four pairs with small young, and on the following day I made the first visit with recording apparatus, but the birds were not close enough to the microphone.

We came back on June 22nd, and John went off to look for a nest. This was no easy task, and it was a great feat in the end to find a scrape in the gravel, no bigger than a saucer, in an area as big as Hyde Park. This nest was on a slight ridge some two hundred yards from the concrete wall. However, we could see that several bulldozers and excavators were working near the nest, and one was only thirty yards away. Unless something was done quickly it seemed likely that this nest with its three eggs would be crushed into oblivion at any moment. And here Mr. Wilson, the resident engineer of the Metropolitan Water Board, came to our rescue. He offered us the loan of wooden posts and wire, which we were able to put up around the threatened nest. Instructions were also given to the drivers of the excavators to keep away from our wire fence until the young birds had hatched and safely left the area of the nest.

On June 25th we returned to the nest again, this time in the company of Eric Hosking and George Edwards who were

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- 1,800 ft. spool tape.
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FREE

Send for your copy of this useful booklet, which, besides listing the many uses of a Tape Recorder, includes a chapter on recording technique.



anxious to take photographs of the little ringed plovers at the nest. Three days later I came again with Stan Unwin, a B.B.C. recording engineer, now "Professor" Unwin of television and radio fame. This was the first occasion on which we used a new kind of tape-recorder which provided us with a greatly increased period of continuous recording. Our recording car was driven round the concrete wall of the reservoir and parked on the wall at a spot opposite the nest, but so close to the concrete slope that the birds would scarcely notice it. From the car I ran out three hundred yards of cable; then I dug a hole in the loose gravel, some two feet from the nest, placed the open microphone in the depression and covered all but its face with stones. In under four minutes I was climbing back up the concrete slope of the wall and, as I turned to look at the nest through my binoculars, I could see the hen bird run back to the eggs, sit and begin incubating.

From the loudspeaker in the car we could hear every sound that she made. John Parrinder was looking for other nesting sites some distance away, and this caused her to give some quiet low-pitched 'que-oo' notes of slight anxiety. As he worked his way nearer to the nest she produced a more rapid 'quip . . . quip' but, as the figure of John began to move away, she settled down to brood the eggs in complete confidence.

During the evening the cock bird stayed away, and he only paid one late visit, sweeping at speed over the shingle ridge. Stan and I saw him coming so that the recorder was switched on in time. He made no sound but the hen raised her head and gave a strange laughing call of recognition which had much of the quality of the green woodpecker's yaffling note. Throughout the rest of the night the little ringed plovers were silent, and the three humans spent the night lying on the concrete slope of the reservoir, talking in hushed tones, refreshing themselves with rum and sandwiches and staring out over the stark black oval of the reservoir basin, ringed with rows of street lamps and neon lights. While London's millions slept, we kept our night's vigil with a silent pair of birds—it was a night of comradeship and excitement that I shall always remember.

Recording at dawn

Just after three o'clock in the morning a skylark rose from the darkness of the basin and began to sing. Some others joined in this dawn chorus and we switched on the recorder. At twenty five minutes past three the cock bird came in and began to walk towards the nest. Once again the hen gave her laughing call and the cock answered her with a soft "qui-voo" note. These calls of conversation were very quiet indeed, and were only audible with the unaided ear at a few yards range. The microphone,

however, was able to pick them up without difficulty and, although the hen called only twice in eight and a half hours, we recorded both her outbursts lasting under seven seconds in total time.

With the arrival of daylight, I went out across the reservoir floor to recover the microphone and cable. When I had done this we moved down the reservoir several hundred yards where another hen was marshalling and looking after several small chicks. As both the adult and the downy chicks were always on the move, I carried a small parabolic reflector down on to the gravel. By sighting this on the bird family I was able to obtain a wide range of recordings of their calls.

In the middle of July, John was able to find four chicks and he carried one of them over to a microphone which we had already placed on the gravel. The little ball of fluff nestled down in the palm of his hand and gave out, from time to time, a tiny sharp "Cheep", like a high, less crisp version of the adult's call. All the youngsters were then ringed and released. We spent another night on the concrete slope and recorded a stirring symphony of alarm notes as a family party of birds flew past us in the dark.

The sanctuary is flooded

The sanctuary of the little ringed plovers was doomed, however. By the middle of August the building and huts on the reservoir floor had gone, and a large lake had appeared in the middle with many smaller pools. The little ringed plovers had already left for Africa, but there were parties of migrant waders such as dunlin, green and common sandpipers, snipe, curlew and a solitary greenshank. On September 4th John Parrinder and I attended the inauguration ceremony and watched Mr. W. H. Girling, Chairman of the Metropolitan Water Board, open the new reservoir that bears his name. In the next few months more than 3,400 million gallons of water flowed into the basin and over the breeding sites of six pairs of little ringed plovers. On March 23rd of the next year John saw the first returning bird on the wall of the now filled reservoir. In the following summer at least seven pairs, with a probability of two more, nested at four places in the Lea Valley so that the birds had been able to find new homes. In 1951 some 28 pairs of these birds nested in Britain and in 1953 the number had risen to 37. In 1956 the total number rose to over 70 pairs, of which at least 50 were proved to breed.

Sometimes I have occasion to pass the great reservoir at Chingford today and, I stand for a moment looking at the slopes and banks, I can recall with great clarity the days I spent on its floor and slopes with one of London's most attractive and rare birds.



By holding a little ringed plover chick close to the microphone, it was recorded for the first time. (Photo by Eric Hosking).

RECORDING FOR BEGINNERS

PART FOUR — IMPROVING THE QUALITY

By A. Tutchings



This learn-as-you-build series began with a basic kit of parts which demonstrated the uses of a simple transistor amplifier coupled to a microphone/earphone and magnetic head. We have now reached the point where frequency correction and bias adjustments can be made to improve recording and playback quality. The photograph (left) shows the microphone, amplifier, and head set up to record on the tape of a Grundig TK5. This arrangement could also be used, say, to record with the circuit of fig. 2 from a radio set, and the Grundig would give continuous monitoring of the resultant recording.

OUR recording experiments with DC bias have so far been limited to speech from the microphone via the single stage transistor amplifier, and it is now time to explore the possibilities of recording from the output of the radio set. If the set is fitted with Ext. L/S terminals, it is first necessary to check that the output is low impedance, and does not carry any dangerous voltage. The impedance may be checked by connecting a 3 to 10 ohm resistor across the sockets; this should make a just perceptible difference to the L/S level when it is reproducing a radio programme. If connecting the resistor drops the volume very considerably, it probably means that the set is an old one with high impedance Ext. L/S output, and in addition the terminals may carry the full HT voltage of the set, which could give a nasty shock. If the output does prove to be high impedance you will have to buy an output transformer with a step-down ratio of about 30 to 1. Connect the primary to the Ext. L/S terminals, and use the secondary terminals for the recording experiments.

If your set has no Ext. L/S terminals, you can connect a pair of wires to the voice coil terminals of the internal loudspeaker, but you should carefully check that your radio set is not of the AC/DC, or transformerless variety, where the chassis is connected directly to one side of the mains supply. If you are in any doubt, consult your dealer. If the set is of this type, you should ask your dealer to fit an extra 30 to 1 output transformer with the primary connected in parallel with the one in the set, and with the secondary connected to a pair of output sockets.

Experiment 11—Recording from Radio

Fig. 1 shows how to connect the recording head to the low impedance Ext. L/S terminals via a 10k resistor and 4.5 volt flashlamp battery which supplies the DC bias. It will be seen that the current through the head will be the same as for experiment 9, i.e. 4.5 volts through 10k, which gives 0.45 milli-amps. The head windings should be connected in parallel for this experiment.

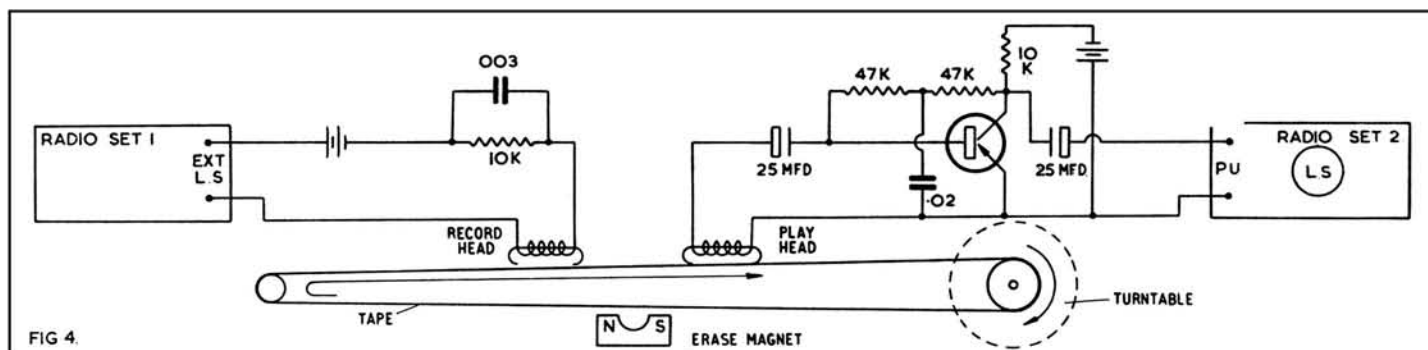


Fig. 4.—The tape loop allows continuous listening to programme while adjustments are being made to the equalisation, level, or bias.

RECORDING FOR BEGINNERS

continued

Erase a loop of tape with the permanent magnet, carefully noting the polarity for future tests. Next tune in a suitable radio programme, and set the volume to normal listening level. Unplug one of the wires which feeds the recording network, and set the tape loop rotating. When the join comes round for the first time, plug in the recording circuit, and leave for one complete revolution of the tape loop.

Now re-connect the head to the input of the playback amplifier, as in part three of this series. If the output is thin and distorted, repeat the recording experiment with either the erase magnet or the bias battery reversed. A few trials at various levels should give a recording which is relatively undistorted, although the background noise may be a bit high. You will find that the recording level is fairly critical with DC bias, and that the maximum undistorted output is a little lower than that of the pre-recorded tape you used in the first playback experiment.

Varying the bias current

When you have established a recording level which is a good compromise between distortion due to tape overload, and background noise due to the DC bias, you should experiment with the bias current. The best way of varying the bias current, without altering the signal current, is to change the bias voltage. One way of doing this is to purchase an extra 1.5 volt cell and connect this in series with the bias battery; first so that the voltages oppose each other which will give a resultant voltage of 3 volts, then without the extra cell for 4.5 volts, and finally with the voltages adding to give 6 volts.

If you find that a change of bias current is desirable, you should go back to 4.5 volts and alter the series resistor, reducing it towards 5k (but no lower) to increase the bias current, and increasing it towards 20k to decrease the bias current. Remember that you will have to alter the L/S volume to maintain optimum signal current throughout these tests.

I would suggest that you make up a number of tape loops, labelling each one with an arrow to indicate direction of rotation, and a number to identify each test, and do a series of recording tests as described above. Then rewire for playback, and play your loops, selecting the one which gives the best results and erasing the others for another series of tests.

Once again I would emphasise that you should be quite sure that you are getting consistent results on bias and signal levels before proceeding with further experiments.

Experiment 12—Pre-emphasis

If you listen to the loudspeaker during recording, and then to the same programme on playback you will find that apart from background noise, and perhaps slight distortion, there is some difference in frequency response, the very high and low frequencies being most affected. The low frequency loss is due to the response of the playback head, and is partly compensated by the feedback in the preamplifier, as described in part two of this series of articles. The high note loss is almost equally distributed between the recording process, tape demagnetisation, and head and gap losses on playback.

Pre-emphasis of the high note response during recording is

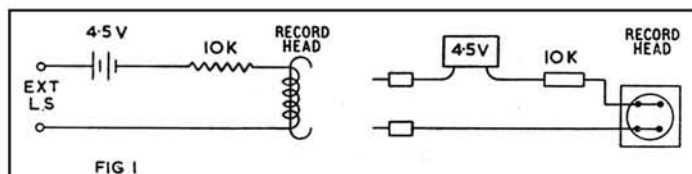


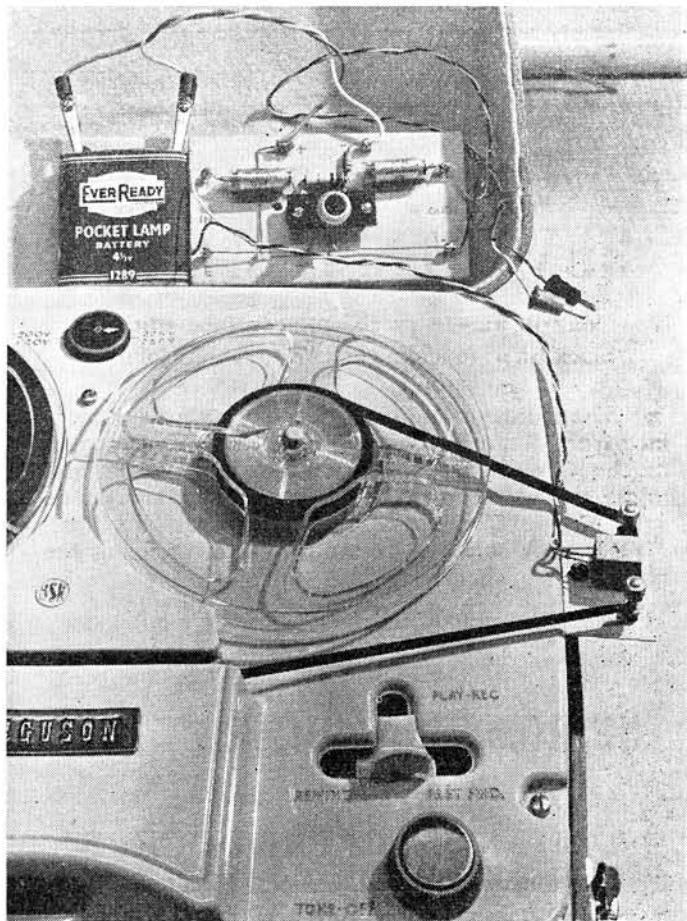
Fig. 1.—Incorporating DC bias, when recording from the Ext. L/S sockets of a radio

possible because very little energy is contained in the top two or three octaves of average speech or music. Because of this, it is possible to boost the current in a magnetic recording head at high frequencies by three to four times compared with the current at the middle and low frequencies with little chance of overloading the tape. In our simple recording system we do this by connecting a suitable condenser across the 10k feed resistor so that the impedance of the condenser falls at high frequencies, and increases the current through the recording head. Fig. 2 shows that a value of 0.003 has been selected for this circuit.

In the earlier single transistor recording experiments the pre-emphasis was provided by the rising high note response of the microphone, but now that the correction is done in the feed circuit to the head it will be found that speech from the microphone, via the preamplifier, radio set, head and tape, will sound slightly shrill compared with recorded BBC speech. It is possible to equalise this rising response at the microphone and Fig. 3 shows a suitable correction circuit which is connected across the microphone terminals, and which results in a more balanced speech quality, both on direct listening, and on recordings via the Ext. L/S terminals.

Experiment 13—Optional loop experiments

If you are superstitious you can skip this one, in any case it is only possible if you are the proud possessor of two radio sets and



Adding monitoring a few seconds after recording (on a Ferguson 441). The pre-amplifier may feed a radio, amplifier, or sensitive headphones

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BEGINNERS' RECORDER — (continued)

two heads—magnetic ones I mean. Before saying goodbye to the loop and the rubber heel, which have served us faithfully for the last month or two, I would like to describe a very elegant experiment which is the poor man's equivalent of a device used in almost all tape or head testing laboratories. This set-up allows endless recording of, and continuous listening to, any programme via tape with the facility of hearing immediately the effect of any changes in equalisation, level, or bias, and which uses only a few feet of tape. It is, of course, a tape loop with an erase magnet, recording head, and playback head in sequence along the length of the loop, together with the appropriate feed and playback

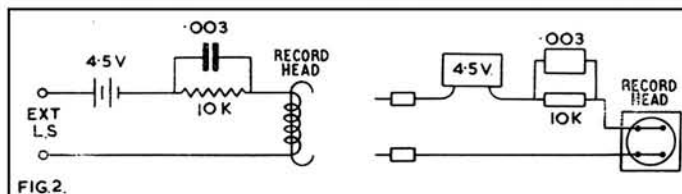


Fig. 2.—Boosting the high frequencies at the input.

amplifiers. Fig. 4 shows the detailed connections, and also serves as a 'recap' of the erasing, recording, and playback recommendations which we have evolved so far.

If you have access to a standard tape recorder, there are two further experiments which may be tried to allow continuous monitoring of the play or record functions:

(a) Record on the commercial recorder, and place the kit playback head against the tape a few inches from the capstan on the way to the take up reel. Connect the head to the preamplifier and

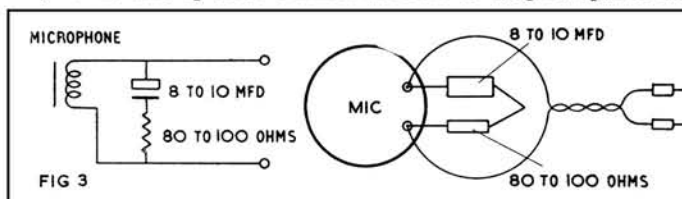


Fig. 3.—Suitable correction circuit to oppose the microphone's rising characteristic.

loudspeaker so that you hear a slightly delayed replay from the loudspeaker. You will find that, if you are recording from microphone, the delayed sound from the speaker gives an echo effect, and that by altering the playback volume, and length of tape between the record and replay heads you can alter the apparent reverberation.

(b) Record on the tape via the kit microphone and preamplifier, or via the radio set and feed circuits described above, placing the record head on the supply reel side of the commercial recorder replay head, so that you can hear on the recorder L/S the effect of any circuit, bias or level changes on the recording side.

Next Month: The effect of tape speed on the quality of recording.

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TAPE RECORDERS— —SOME USEFUL FACTS

THE basic principle is simple enough. Tape from one reel is unwound and fed past the heads (see fig. 1) which pick up or record the signal before being rewound on to the other reel. The speed at which the tape moves must be close to the nominal value; but more important still, there must be no rapid variation in speed which could cause changes in pitch on reproduction. This effect is referred to as wow or flutter. For ease of control, facilities are essential for fast winding and for reliable braking of the reels to avoid spilling the tape.

Machines for home use are "half-track". This means that only half the width of the tape is used at the first run through. The tape is then either reversed by changing over the reels or, on some designs, is run back in the other direction. Fig. 2 shows the way that the tracks should be arranged on the tape.

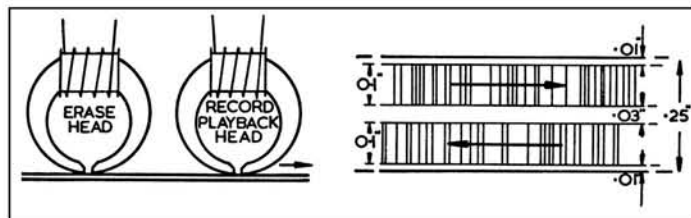


Fig. 1 and right Fig. 2.

Tape speed is of considerable importance. Higher tape speeds give better quality, but they use up more tape. This variation in quality with tape speed is a function of the recording system. The record head consists of a ring-shaped iron core in which is a narrow gap. The core is wound with a coil of wire, as shown in fig. 1. Programme material is converted into electrical impulses which are fed to this coil. The tape, which is coated with magnetic material, is moved past the gap in the core, and as it does so it picks up the

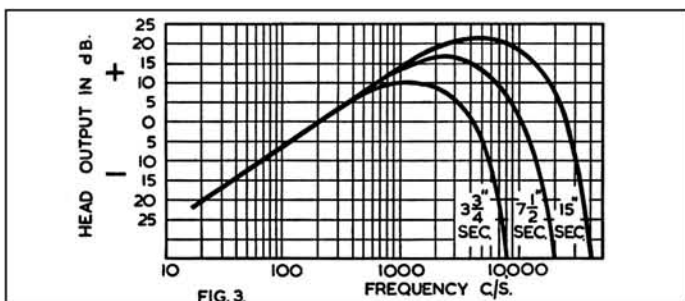


FIG. 3.

magnetic fields induced in the head by the recording current. The playback head is similar to the record head and may, in fact, be the same one.

When the magnetised tape is moved past the playback head a voltage will be induced in it which, after suitable amplification, can be fed to a loudspeaker. Suppose then that a constant current is passed through the record head at various frequencies. This will produce a constant peak magnetisation in the tape. On playback, however, the voltage induced is proportional to the rate of variation of this magnetism and will increase directly with the recorded frequency. Provided that the same speed is used for record and playback this voltage will be the same whatever tape speed is selected. However, a time will come, as the frequency is raised, when the wavelength of each cycle, as recorded on the tape, will approach the size of the gap in the heads. When this happens the whole process breaks down, and the record and playback heads cease to function. The frequency at which this rapid drop occurs depends on the size of the gap and the speed of the tape. Higher tape speeds enable higher frequencies to be recorded because the wavelength at the same frequency is longer. It is not necessarily desirable to reduce the size of the gap because the output at all frequencies will also be

reduced. Fig. 3 shows the effect of different tape speeds on the output resulting from constant current input. The output is the same below about a 1,000 c/s but above that there is a turnover point, and a

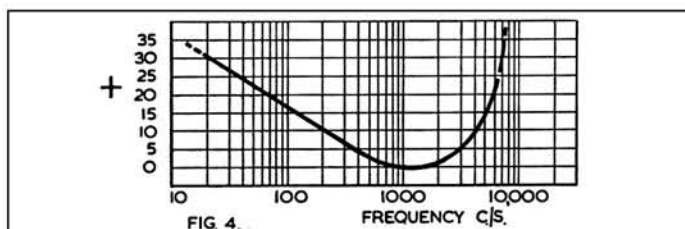


FIG. 4.

sharp drop in output at different frequencies for each speed. The maximum practicable frequencies with these particular heads are about 5,000 c/s at $3\frac{3}{4}$ i/s, and 10,000 c/s at $7\frac{1}{2}$ i/s, and 20,000 c/s at 15 i/s.

As a result of the considerable drop in output in bass and treble, the associated amplifiers must have a corresponding increase in gain at these frequencies. Fig. 4 shows the response required for $3\frac{3}{4}$ i/s, which is no more than a mirror image of the appropriate curve in fig. 3. This equalising can be done on record or playback. It is usual to do all the bass equalising in the playback amplifier. The treble equalising can be done on "record" with advantage, because there is likely to be a lower level in the treble than at mid frequencies, and the tape is also better able to handle the larger amplitudes. This procedure results in a better ratio of signal to high-frequency tape noise.

C.C.I.R. playback curve

A playback curve has been suggested by CCIR, for a tape speed of $7\frac{1}{2}$ i/s, in which all the bass boost must be done on playback. No additional equalising in the treble region need be introduced unless the playback head used is considerably worse than the standard head considered by the recording companies. Since pre-recorded tapes are recorded to suit this curve, it is convenient to adopt it for the playback amplifier. This recommended curve is plotted in fig. 5. The recording amplifier is required to produce a current through the head, proportional to the input signal. As a result of the non-linear transfer characteristic of the magnetic material used in coating the base, it is necessary to apply a biasing voltage to the heads, when recording, in addition to the audio signal. The applied bias could be a DC voltage but it is more usually an AC voltage of about 50-100 Kc/s in frequency. This bias is normally obtained from an oscillator, although most of the oscillator output is used for erasing.

If we look again at fig. 2 we see that the erase head should provide a band of erase signal which covers the top half of the tape—that is about $\frac{1}{8}$ inch. Whenever a recording is being made, the erase head is energised, and it cleans off all previous recordings. This is achieved

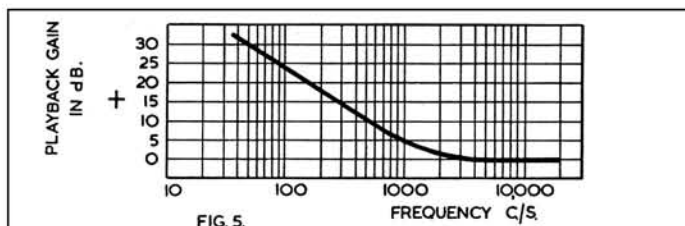


FIG. 5.

by passing a high-frequency current through the head, sufficient to saturate the tape.

The use of AC bias not only results in a reduction of distortion but also enables the tape to handle larger signals. Excessive recording current will nevertheless result in distortion, so some method of indicating the peak recording level is essential.

D. H. W. Busby & J. C. Latham

THINKING ABOUT

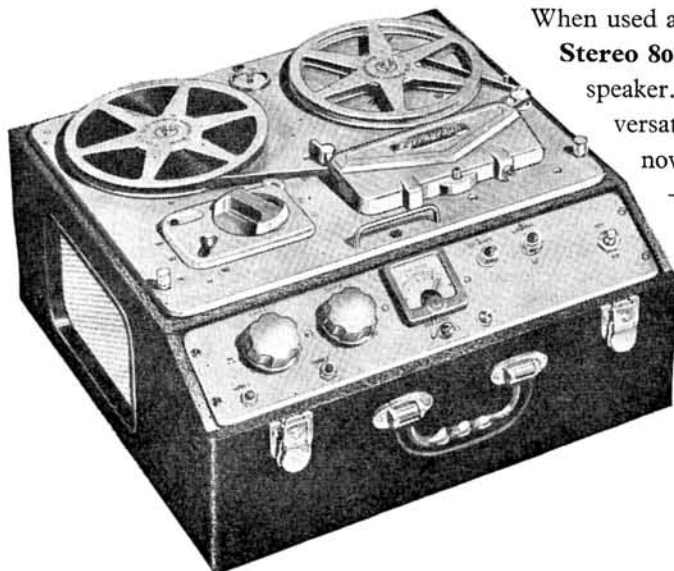
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Readers' Problems

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

Getting the level right

Dear Sir:—My tape recorder has a single knob for controlling the Recording strength and the Playback volume. Obviously, therefore, I can get the same actual loudness from the loudspeaker by having a lot of different settings of this control. For example, I can record with the knob wound up high, and then turn it well down for playing back, or at the other extreme I can record at a low setting and compensate by winding it up on replay.

Is either of these methods better than the other, or am I all wrong about this? Worse still, is one of these procedures likely to do any damage to the recorder's valves, etc.? I ought to say that there is a magic eye on this machine, but I am not sure how to make the best use of it.

Yours faithfully, R. H., Leeds.

The correct recording level is probably somewhere about halfway between the two extremes you describe, but before we try and find out exactly where, let us see what will happen in these two cases. In your first example, you run the risk of overloading the amplifier, both at the time of recording and on playback, at least up to the point in the replay circuit at which the volume control operates. You may, too, record a stronger signal on the tape than the erase head can fully wipe, so that this over-recording may be faintly audible behind the next recording you make.

In the second case, recording at too low a level necessitates (as you point out) a high degree of amplification on playback, which results in a poor balance between the required signal and the inherent background noise. In short, over-recording runs you into distortion, and under-recording brings up the noise level.

You may be tempted to ask, therefore, why do they give us a Recording Gain control? Why don't they just pre-set the gain at the level which is just right and give us a loudspeaker volume control only, to adjust the loudness to our liking? The answer is that, using the microphone, or radio, or gramophone pickup, a vast range of input levels is possible, and we are meant to adjust the Gain control to iron out the very high and very low signals so that a happy medium is passed to the recording head.

It is here that the Magic Eye or other form of Level Indicator comes in. This is designed to show the level of current flowing through the recording head at any instant. Its readings hop about madly, of course, because each syllable or musical note produces a distinct peak in the current, so it is the peaks in reading that you must accustom yourself to watch. With a meter type indicator, the exact readings of the wagging needle can sometimes be difficult to judge, but the standard magic eye is usually lined up so that the eye closes or just overlaps at the maximum permissible level. This is the correct reading to establish for each kind of recording—normal speech, whispering, music, etc. In the case of recording from radio, a single experimental adjustment should be all that is necessary, because the BBC engineers are doing the work for you in controlling their programmes all to a standard peak volume.

The manufacturers of recorders with a single volume control, will usually have arranged that a half-way setting of the knob will produce the correct recording level on a standard signal—e.g. conversational speech one foot from the microphone. They will also have aimed at producing a convenient loudspeaker volume with this same setting of the knob.

Duplicating tape records

Dear Sir:—I have recently been reading a back number of *The Tape Recorder* (which appears to me to be a very useful journal, ideal for those enthusiasts not predominantly technically minded, etc.) and should like to ask your advice about one aspect of tape recording, i.e. the transcription and duplication of tapes.

I have recently acquired a 600' tape and have recorded on this, but would now like a duplicate made if this is possible. I am a complete beginner in the amateur tape recording field, and would

appreciate your advice on whether it is practicable to transcribe either from tape to tape or from tape to gramophone discs. I presume that this is possible, since some commercial firms etc., advertise such copying (vide *The Tape Recorder*), but I should like to know whether you actually recommend these forms of copying as giving first-class quality on the recorded duplicate tape (or record). Is there any appreciable loss of quality or increased wow or flutter on any duplicate tape (record) made by such a process? If so, is there any method of duplicating tapes which can be employed without having to face a possible loss of reproductive quality etc?

Yours faithfully, G. N. B., Bilston.

Given a perfect tape or disc recorder, it would be possible to produce an exact duplicate of your original tape recording. Such perfection is not with us to date, but the machines used by professional tape-to-tape and tape-to-disc engineers can get very close to it. We can therefore recommend this method of duplicating recordings—as it is often required to supply wedding or holiday recordings to members of the family etc. etc.

Ways in which the copy fails to reproduce the original include wow and flutter (as you mention), frequency response, and background noise. In the case of all these, the results will depend on the poorer machine involved. We ought to point out, however, that if you have discs cut of your recordings the reproduced quality will very much depend on the gramophone pickup and associated equipment you employ. And this goes for any of your friends to whom you give the discs.

Cross-tracking on 4-track tapes

Dear Sir:—I am interested in a tape recorder having 4-track recording facility on ordinary tape, and selling at 64 guineas (mike extra). There lies at the back of my mind, however, a nagging doubt as to the possibility of "cross-talk" (crossing of recordings) creeping in, especially if a spool happens to be unevenly wound.

Could you please inform me if there is any justification of this doubt materialising. I am not quite clear as to the normal cause (and cure) of this phenomenon; perhaps you will be good enough to clarify same. I refer at the moment to monaural recordings, and have been given to understand that cross-talk occurs even on the ordinary 2-track system.

Yours faithfully, D. L. G., Stoneleigh.

The whole question of cross-tracking was discussed in our *Workbench* feature in October. Since the unwanted scanning of one track, while reproducing another, is a function of the true horizontal alignment of the heads, and the even spooling of the tape, the tolerance is reduced with four-track tapes. However, all being well, you should have no difficulty with a well-maintained machine.

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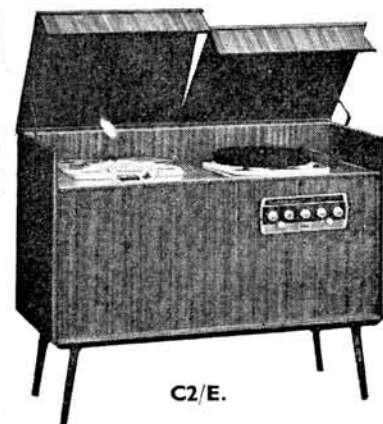
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FIELD TRIALS OF PORTABLES

NO. 2

THE "CLARION TRANSITAPE"

By John Borwick

The new battery portable tape recorders, which can be taken anywhere, do not claim the high technical performance of larger machines. We feel therefore, as we said last month, that the strictly technical review is out of place. Our field trials describe actual recording sessions made under typical conditions, and try to answer such questions as "Can I really take it anywhere?", "Can anyone learn to operate it easily?", and "Are its tapes interchangeable with other machines?"

Joyce, mine hostess at "The Old Swan" by Swan's Wharf, Battersea, answers a few questions into the Clarion's microphone.

THE Clarion Transitaape is a miracle of compactness. Take away from the $9\frac{1}{2} \times 5$ ins. top panel the space occupied by the loudspeaker and the control switches, and we have a deck measuring only $6\frac{1}{2} \times 4$ ins.! And yet this copes with the standard 3-inch diameter spools, and runs at the popular speed of $3\frac{3}{4}$ i/s.

The smallness of the Clarion is by itself attractive, and the colour scheme is in two tones of blue/grey, with a transparent plastic lid. A sensible and strong carrying handle is fitted, and the loudspeaker grille is sloped sufficiently to allow the microphone to be comfortably stored there in transit. While we are on the subject of transportation, it is a pity—at least on the model tested—that no provision is made for keeping the spools on their spindles when the machine is tipped up beyond the vertical. For normal carrying, it is a simple enough matter to lay a pad over the spools so that the lid keeps them pressed in position, but for actual recording and playback the machine cannot be safely placed upright.

A tough assignment

Soon after the machine was received for test, it was given a very tough assignment. On a training course for teachers in East Suffolk, we wanted to produce a recording of two girl students arriving on a course for the first time, with as much movement and action as possible.

A mains recorder could have coped with some of this, but not all. Using the Clarion, we proceeded as follows:—the girls scrunched

along the gravel drive carrying the Clarion and chatting quite naturally; I drove up with a squeal of brakes, and offered them a lift; they climbed in, still recording, and we talked some more while I drove round the block merrily changing up and down gears (a fade down and up in volume in the middle of this gave the effect of "the passage of time"). Then we pulled up at the College, and the girls carried the recorder inside, were shown their room, interviewed by the Principal, and finally joined the mob of other students in the Common Room.

Mobile recordings better than studio

Running the recording through later, and listening on the Clarion's tiny built-in loudspeaker, we were delighted to hear numerous unrehearsed sounds such as the singing of birds, and the creaking of the staircase. These completely justified our acting out this sequence in real life, instead of trying to mock it up in studio fashion. The quality from the Clarion was naturally on a par with that of a small portable radio, since the small loudspeaker cannot be expected to reproduce the full frequency range.

But when this recording was spliced into the composite programme of which it formed a part, and the complete tape "broadcast" from a large machine, the results were quite impressive. The sense of movement we obtained in these mobile recordings made a good contrast too with the more static items in the programme.

The ability to play the Clarion's tapes on other machines, and

FIELD TRIALS OF PORTABLES

THE "CLARION TRANSITAPE" *continued*

vice versa, is an extremely useful feature, which was thoroughly tested and found to work perfectly. Also, there is a special output socket on the Clarion which permits reproduction through an external amplifier. The running speed is controlled by a patent governor, so that the fixed rate of $3\frac{3}{4}$ i/s is maintained even when the batteries are approaching the end of their life.

The battery complement could scarcely be more elementary, and easy to replace. Four leak-proof U2-type torchlight batteries are all that are necessary, and give a total playing/recording time of 50 hours. As an alternative, the machine may be powered from any external 6 volt battery—such as that in a car—the operation of plugging in the external power lead automatically switching out the internal batteries.

The controls

The controls took a little getting used to, but have the advantage of being reasonably fool-proof. There are two push-buttons with arrows pointing Left and Right respectively. Depressing the first of these runs the tape at the fixed speed of $3\frac{3}{4}$ i/s, and the machine is either in the Record or Playback condition according to the position of a two-way slide-switch on the side of the machine. In "Record", which reveals a red panel, this switch changes over the amplifier's input and output circuitry, of course, and also moves the permanent magnet head forward on to the tape.

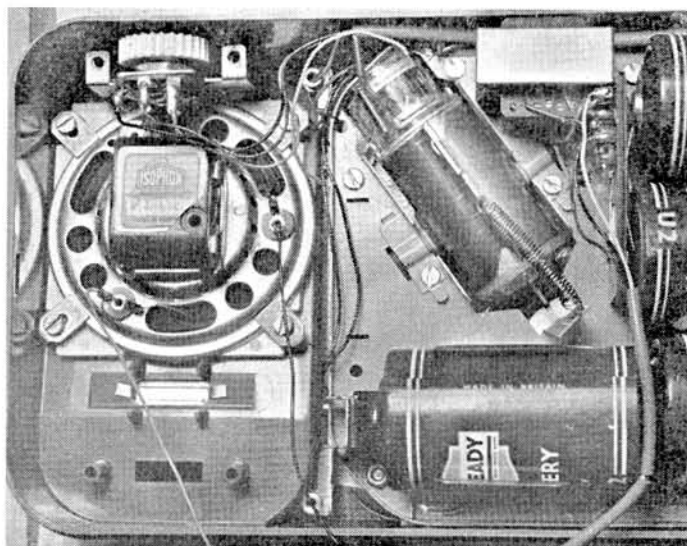
The Right push button is used for recording the tape, but the Record/Playback switch just described operates a safety catch which prevents the tape from rewinding while the erase head is in contact with the tape. The time taken to rewind a full reel of double-play tape supplied was found to be approximately four minutes. The recording time available is 22 minutes on each track, 44 minutes total, which at $3\frac{3}{4}$ i/s is very useful indeed. An unconventional feature of the Clarion, which I cannot remember seeing on any other recorder, is that the spools turn in a clockwise direction during record/playback. However, the standard recording sense—top track, left to right, is achieved by leading the tape off from the supply spool with the coated surface to the front, and having the erase and record/playback heads in front of, instead of behind the tape. In this back-to-front arrangement, the heads cover the lower track.

The volume control fulfills the usual dual functions of adjusting the amplifier's gain on recording and on playback. There is, in addition, a loudspeaker ON/OFF switch. The usefulness of this may not be immediately apparent, since it is usually an embarrassment to have the loudspeaker on when recording through the microphone. (To avoid the possibility of acoustic feedback, most recorders are interlocked to switch off the loudspeaker during recording.)

But the ability to switch on the loudspeaker independently can often be extremely useful, for example to monitor while recording from radio

or pickup, or simply to use the recorder as a straight-through amplifying system. This latter application was put to the test a few days ago when I was recording a short play on which an office intercom set was required. The "voice from the other room" was obtained by speaking into the Clarion's microphone. This, reproduced from its loudspeaker, was picked up on a second microphone, plus the voices of the other characters, and recorded on another machine.

Yet another useful idea for using the built-in loudspeaker is to enable any number of people in the room to listen in to telephone calls. A telephone adaptor replaces the microphone—Clarion offer one as an accessory with a rubber suction disc to fit on the back of the



Removing the base plate gives access to the battery compartment, and shows (from left to right) the loudspeaker, with its volume control on top, the $3\frac{3}{4}$ i/s motor, and the output transformer.

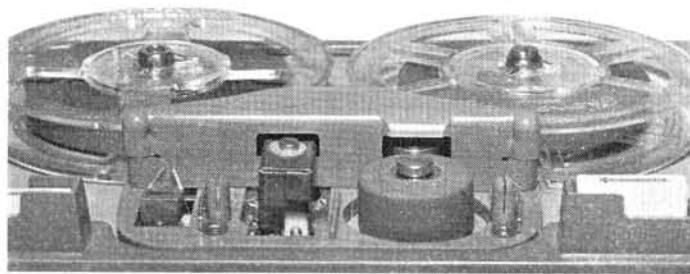
telephone base—and the amplified voices will be reproduced from the loudspeaker. You record or not during this as you wish, or if the telephone message is private you can record it with the loudspeaker switched off.

To sum up, therefore, the Clarion Transitape incorporates in extremely small bulk a number of useful technical features which merit the machine's being studied either for use along with an existing static machine, or by itself. And the price is one which would have seemed impossible a year or so ago.

Technical Specification

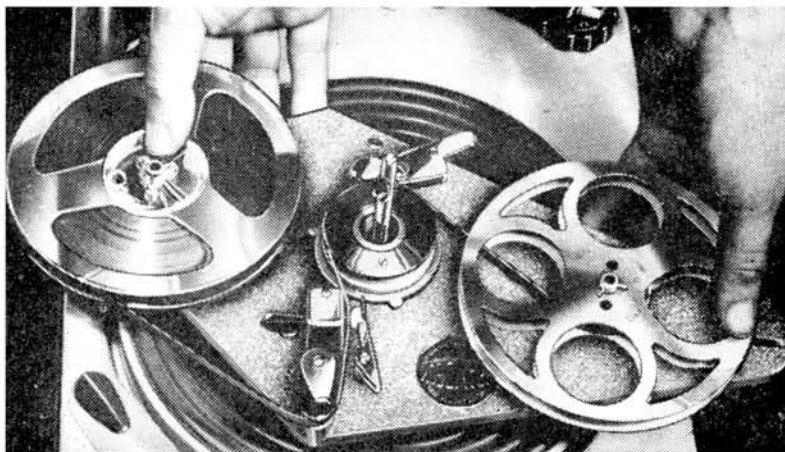
Battery complement: 4 × 1.5 volt Leak-proof U2 type. **Operating life per set of batteries:** 50 hours. **Transistors:** OC71, GFT21, OC76, GFT32. **Playing time:** 22 minutes each track using the Double Play Tape supplied. **Spool size:** 3 in. **Recording Sense:** Top track left to right (in effect). **Tape speed:** $3\frac{3}{4}$ i/s. **Frequency Response:** 200–6,000 c/s. **Output power:** 20 mW. approx. **Input for microphone or radio etc.,** 200 microvolt sensitivity at 200 ohms. **Output for external amplifier** 1 volt at 1,000 ohms. **Dimensions:** $9\frac{1}{2} \times 5 \times 3\frac{3}{4}$ in. **Weight:** 5 lb. **Price:** £26 5s. Including tape and microphone.

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Close up of the heads, capstan and pressure roller with cover removed.

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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.

T.S.L. distribute Four New Models

TECHNICAL Suppliers Ltd., Hudson House, 63, Goldhawk Road, London, W.12, have announced 4 new recorders of continental manufacture, which they are distributing in the U.K. Three of these are four track stereo/mono recorders, the fourth is a portable professional mono recorder of advanced design. The 7-inch spools are placed one above the other resulting in a remarkably compact machine.



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The latest Harting, the HM8, choice of 2 speeds is given
★

The latest **Harting**, the HM8 is a 4-track stereo recorder, retaining all the best features of previous models but giving many extra facilities. There are two speeds, $7\frac{1}{2}$ and $3\frac{3}{4}$ i/s. At $3\frac{3}{4}$ i/s, using long play tape (1,800 ft.), over 6 hours playing time is available when recording mono, or half that for stereo. Using 4 track heads the following facilities are available, $\frac{1}{4}$ track stereo, $\frac{1}{4}$ track monaural, $\frac{1}{2}$ track stereo, $\frac{1}{2}$ track monaural, full track monaural. Monitoring can be carried out on each or both channels, as desired during recording. Output is 5 watts total ($2\frac{1}{2}$ watts per channel) switchable to built-in speakers provided, one in case, the other is in the lid, or to two external 3-ohm loudspeakers. There are also two low-level cathode follower outputs for feeding external amplifier systems, stereo or mono. The claimed frequency response is 30-20,000 c/s ± 3 dB at $7\frac{1}{2}$ i/s and 30-16,000 c/s ± 3 dB at $3\frac{3}{4}$ i/s and wow and flutter less than 0.1 per cent. combined. Price is £90 6s. microphone and tape are extra.



★
The Korting is single speed and priced at £71 8s.
★

The **Korting** 4-track stereo recorder is very competitively priced at £71 8s. tape and microphone extra. An interesting feature of this machine is that the twin pre-amplifiers are transistorised. Other features are $3\frac{3}{4}$ i/s; two high impedance inputs for stereo microphone or pick-up and two inputs for radio; mixing of inputs; monitoring; balance control; separate bass and treble controls; 7-inch spools. The claimed frequency response is 30-16,000 c/s ± 2 dB and the wow and flutter less than 0.15 per cent. combined. One internal speaker is fitted for monitoring and monaural use, for stereo an extension speaker is required or, preferably, two good quality speakers.

The **Elektron** 9/4S is a small light stereo recorder, weighing only 17 lbs. the size is $13 \times 10\frac{1}{2} \times 6$ ins. $5\frac{1}{4}$ -inch spools are used,



★
The Elektron 9/4S single speed $5\frac{1}{4}$ in. spools
Price £80 17s.
★

the tape speed is $3\frac{3}{4}$ i/s. A heavy duty hysteresis motor is fitted. There are facilities for using it as a normal stereo amplifier, balanced magic eye recording level indicator for both channels; low level outputs on both channels for feeding an external stereo power amplifier and high level outputs at 15 ohms for external speakers. The claimed frequency response is 30-16,000 c/s ± 2 dB and wow and flutter, less than 0.12 per cent. combined. The price is £80 17s.



★
The Timbra, a semi-professional machine with unusual features
★

The **Timbra** is manufactured in Holland, and has an interesting specification. The use of spools one above the other has made it possible to produce a recorder using 7-inch spools and yet measuring only $11\frac{1}{4} \times 12\frac{1}{2} \times 6\frac{1}{2}$ ins. The weight is quite high, 39 lbs., this is due to the very robust construction of deck and case and outsize transformers and motors. Three hysteresis motors are used giving very good speed stability, wow and flutter figures of 0.075 per cent. are claimed and a rewind time of 40 secs. for 1,200 ft. of tape. It operates at two speeds, $3\frac{3}{4}$ and $1\frac{1}{2}$ i/s, with a claimed frequency response at these speeds of 30-18,000 c/s ± 2 dB and 30-12,500 c/s ± 2 dB. A monitoring replay head is fitted with separate amplifier for monitoring recorded material. There are built-in mixing facilities, a clock type indicator; magic eye level indicator, full range tone and volume controls and multi-level inputs and outputs. The price is £93 9s. We are eagerly awaiting this most unusual recorder for review.

Full details of these recorders will be supplied by the U.K. distributors, on request.

Philips announce 2 new recorders

PHILIPS Electrical have added two new models to their range of portable tape recorders, the EL3527 and the AG8108G, the new ones are the EL3515 the EL3538.

The **EL3515** is a small single speed recorder operating at $3\frac{3}{4}$ i/s. Spools of up to 7 in. can be used. The claimed frequency response is 50-14,000 c/s. Features of this machine are, the use of a new type of "magic ribbon" level indicator; the amplifier can be used straight-through; record safety lock; and level pre-adjustment switch enabling the correct level to be set before recording;

BRITISH AMATEUR
TAPE RECORDING CONTEST

Congratulations!

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1st PRIZE
WITH THEIR
CLUB SECTION
ENTRY

Photograph shows several happy members of Dundee Tape Recording Club who made the winning entry with a selection of Brenell equipment. To quote the Club Secretary "the major part of this tape was done on my Mark 2 and a Mark 5 also played its part. All the mixing was done on my Brenell simple mixer unit and we found it an excellent piece of equipment. Sound effects, music and commentary were blended without any trouble at all."

Congratulations!

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whose fine equipment helped to make this success possible.

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Four recording speeds, uses 8½ in. reels, three independent motors. Price including 1,200 ft. of tape 64 gns.

Other models include:—Brenell 3 star, 58 gns.; Stereo version 89 gns., or with two microphones, 95 gns.; Mark 5 Deck, 28 gns.; 3 way mixer 58s.



Brenell performance is true-to-life performance



TAPE RECORDER WORKBENCH

By A. BARTLETT STILL

AS I sit down to write "Workbench" for the December issue it is, in fact, still several weeks before Christmas. I find it, however, natural to look back over the first year of publication and, in particular, to consider the various happenings in the world of tape since this series started in the June issue.

In my second article I talked about the use of a tape recorder out-of-doors, working from a battery through the medium of a converter. Those words were written towards the end of May and, doubtless with our experiences of the previous year in mind, I was, by implication at least, a little scathing of the prospects for this year. How wrong can you be! Perhaps I should try a similar prophecy next year. I believe that, at that time, the only truly portable tape recorder available, outside the wholly professional range, was the Fi-cord. Those of my readers who have the proverbial rich uncle can now drop hints about a choice of machines at little over £25. I have not yet had an opportunity of using one of these, so I can only hope that they will prove to be more than an interesting toy.

I must confess to being a little worried at the tendency, not confined to those new portables, to concentrate on a tape speed of $3\frac{1}{2}$ i/s. I have heard most of the arguments about tape economy, present day frequency response, etc., but remain convinced that $3\frac{1}{2}$ i/s should be offered only as an alternative to $7\frac{1}{2}$ i/s in view of the more satisfying results from the latter.

Using a Klenzatape

Later on in the year, while talking about the importance of cleanliness in respect of heads and the sound channel of the machine, I described a time honoured method of head cleaning using a match stick. It seems I am right out of date. I have been taken gently to task by the Metrosound Mfg. Co. Ltd., for not mentioning their product, "Klenzatape". They kindly sent me a sample to try out on my machine, and I must confirm their claims for the ease with which tape heads can be given regular cleaning treatment without any dismantling being necessary.

I cannot honestly say "I thought my heads were clean until —", because I have tried to "practise what I preach" in the past, and give them regular attention. However I do promise to use this new method in the future without, I am sure, any cause for complaint. Lazy as I am, I will surely have no excuse for postponing such a simple routine as running a short length of tape through the machine on normal playback, because—in effect—that is all there is to it.

Tools for recorder maintenance

Giving practical attention to a relatively complicated (at first sight) device such as a tape recorder obviously requires the use of tools, but I have found that I have surprisingly few in regular use. It might be helpful to list them here:—

Medium sized screwdriver: Philip's screwdriver: Small bladed screwdriver (preferably with a long shank): Snipe nose pliers: Side cutters: Instrument type soldering iron: Cored solder: Dentists' mirror: Tweezers: Pocket-knife: Hand-drill: Test Tape.

These are not all essentials. The dentists' mirror, for instance, is more of a useful accessory to help (say) in determining the value of that condenser right down in the corner of the chassis. The hand-drill was bought in three parts, 6d. each part, before the war, but serves its purpose! One of the test tapes I use is, of course, the C.C.I.R. frequency tape, but this demands a suitable meter to measure the output. What I also use, and have in mind here, is a short recording of a piece of music that is known, has plenty of contrast, and can be listened to in snatches over and over again. Full orchestral pieces, incidentally, are not good, because they tend to cover up wow and flutter too easily. Perhaps some of my readers have their own pet choice already and would like to let me know. My "number one" got spoilt quite recently, it was "The Song of the Maggie", so you can see that I shall not only be pleased to pass on any recommendations, but hope to find a substitute myself.

NEW RECORDERS—(Continued)

monitoring by means of headphones and separate inputs with mixing facilities for both inputs. Generous storage space is pro-



★
The single speed
EL3515, Price
£33 12s. The case
is two tone grey
impact proof poly-
styrene

★

vided for cables and the microphone. Output 2.5 watts. It is suitable for a mains supply of 110-127 and 220-245 volts AC 50 c/s. The case is made of impact proof Polystyrene finished in two shades of grey. The price with crystal microphone and 5-inch spool of tape is £33 12s.

The EL3538 is a three speed recorder, operating at $1\frac{1}{2}$, $3\frac{1}{2}$ and $7\frac{1}{2}$ i/s. Operation is by nine push-buttons grouped along the front. There are sockets for extension speaker, Radio/pickup, external amplifier and for headphones to monitor mixed signals



★
Three speed
EL3538. The price
is £59 17s.

★

of speech and music during recording. A four-digit programme indicator with zero reset enables any item to be selected with accuracy anywhere in 2,400 ft. of tape. The spools are 7-inch. The head cover is removable for ease of cleaning. Suitable for A.C. mains voltage of 110-127 and 220-245, 50 c/s. The weight is 30 lbs. Price with moving coil microphone and 7-inch reel of long-playing tape £59 17s.

Further details of these two recorders from Philips Electrical Ltd., Century House, Shaftesbury Avenue, London, W.C.2.



★
Audiomaster
Stereo tape
amplifier

★

W & N. Elec-
tronics Ltd.,
manufacturers of
the famous Audio-
master amplifiers
have produced an

Audiomaster Stereotape Amplifier. This is specially designed for use with the Harting deck, but it can be adapted for Brenell and Wearite decks. The amplifier contains two record channels which are monitored by means of a one inch Cathode ray tube. Playback can be effected through a suitable pre-amplifier capable of accepting the signal direct from the tape head. The unit is supplied with a switch for mounting on the deck to the right of the push buttons. The wiring on the switch is already carried out so that all that is necessary is to connect the leads provided, to the head. The price with special switch is £33 15s.

Further details can be obtained from the manufacturers at 80/82, Uxbridge Road, Ealing, London, W.13.

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Telephone: EUston 5754 (all lines). Telegrams: Leprod, London.

EQUIPMENT REVIEWED



★
THE
SABA
TK75
PORTABLE
RECORDER
★

Manufacturer's Specification

Mains voltage: 110, 130, 220, 240 volts A.C. **Consumption:** 70 watts. **Tape Speeds:** $7\frac{1}{2}$ and $3\frac{3}{4}$ i/s. 2 motors. 7-inch spools. **Frequency Response:** 30-20,000 c/s @ $7\frac{1}{2}$ i/s; 40-16,000 c/s @ $3\frac{3}{4}$ i/s. **Recording Sense:** Standard. **Wow and Flutter:** $\pm 0.2\%$ @ $7\frac{1}{2}$ i/s; $\pm 0.4\%$ @ $3\frac{3}{4}$ i/s. **Level Indicator:** bar type Magic Eye. Automatic stop and reversal at end of tape. Straight through amplifier, superimposing, and provision for remote control. **Outputs:** from pre-amplifier stage and Ext. L/S 5-10 ohms. **Loudspeakers:** two $6\frac{1}{2} \times 4\frac{1}{4}$ in. **Dimensions:** $17\frac{1}{2} \times 8\frac{1}{2} \times 12\frac{1}{4}$ in. **Weight:** $37\frac{1}{2}$ lb. **Price:** including tape, £93 9s.

Distributed by: **Henri Selmer & Co. Ltd.**, 114, Charing Cross Road, London, W.C.2.

SABA machines are of West German origin and are marketed in this country by Henri Selmer, 114 Charing Cross Road. The TK/75 is of particular interest because of the many facilities provided in a machine of relatively small dimensions, and the wide frequency response that is claimed. A brief glance at the specification shows that four heads are fitted, allowing either track to be played without interchanging spools. End of spool trips are provided, two tape speeds are available, and twin loudspeakers are used. This is achieved in a machine that is only $17\frac{1}{2} \times 12\frac{1}{4} \times 8\frac{1}{2}$ in., and weighs $37\frac{1}{2}$ lbs. The weight is not particularly low, showing that a great deal of ingenuity has gone into the mechanical design in order to get all the facilities into such a small volume.

The case is robustly constructed, and well finished in leather cloth in rather undistinguished but undoubtedly very serviceable shades of brown with the top deck mechanism plate in ivory. This makes a combination that completely avoids the "juke box" appearance that is tending to become standard for domestic tape recorders.

All the controls, except those for replay volume and tone, are carried on the top plate. These two project as edgewise knobs through the front of the case, rather suggesting that the machine may be played with the case closed, though the instruction book contains a specific warning against this, no doubt on the score of overheating. Standard 7 in. spools are the maximum that can be accommodated, the tape run between the spools being enclosed but commendably free from petty obstructions that might snarl up the tape during loading. Between the two spools, and at the rear of the deck, is an EM84 bar type of volume indicator for use during recording. It is rather out of the way at the back of the deck and visibility would be improved by raising the housing a little.

In front of the EM84 is a small red indicator light that indicates when "trick" recording is being done, i.e. when commentary is being superimposed on an existing recording. In the centre of the deck is the speed selector control giving a choice of the two standard speeds, $7\frac{1}{2}$ and $3\frac{3}{4}$ i/s. The knob is balanced by a tape footage indicator, a three digit type, but one of superior appearance. All the main tape controls are of the piano key type, though again a touch of superiority is given by including a series of indicator lamps to provide internal illumination for the key in use. The seven keys give control of "Record, Fast Rewind, Play Top Track, Play Bottom Track, Fast Wind On, and Pause, all the functions being indicated by simple self-explanatory symbols that are presumably current throughout Europe.

Two knobs flank the push buttons, the left one being the Record Volume, and right hand one, the Disc, Radio and Microphone selector switch. The replay volume and tone controls project edgewise through the front of the case, neither having any scale, though the tone control has a black dot, presumably intended to indicate the "flat response" position.

Two internal loudspeakers

The provision of adequate loudspeakers is a problem for every designer of a tape recorder, for it is impossible to find sufficient space without making the machine impossibly large. Recent reviews illustrate the varied solutions that are possible. In the Saba, two $6\frac{1}{2} \times 4\frac{1}{4}$ in. loudspeakers are used in an attempt to provide adequate radiating area.

At the back of the TK75 are two small cubby holes covered by very neat sliding shutters. In one cubby are a group of small sockets of excellent design providing facilities for coupling in a radio receiver, microphone, record player, and a remote control unit, and a socket allowing the machine to be coupled up to an external amplifier. The second cubby provides space for the mains cord and plug, and includes the mains voltage selector panel.

Mechanically the TK75 is most impressive in operation. There is a time delay of about a second between pressing any key and getting the appropriate response, but in a couple of months use there was never any sign of malfunctioning of the obviously complicated mechanism.

The tape spools evenly and tightly on both wind and rewind, even though the rewind time is low—2 minutes being required to rewind 1200 ft. of tape. Noise and vibration are commendably low even on the high speed wind, and the braking system is the most effective yet encountered on any domestic tape recorder.

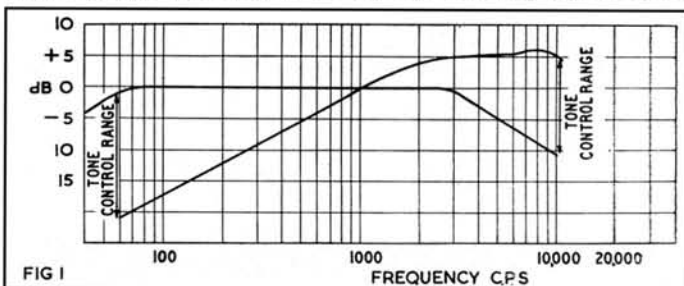


Fig. 1. Replay response at $7\frac{1}{2}$ i/s at extremes of tone control.

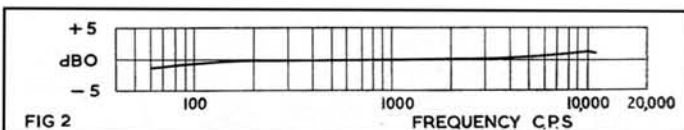


Fig. 2. Frequency response at output socket from pre-amplifier.

The automatic stop at the reel end is operated by a foil end section in the tape, and again it worked admirably. With the record volume control knob in the "out" position, the automatic mechanism reverses the tape direction at the end of a reel and

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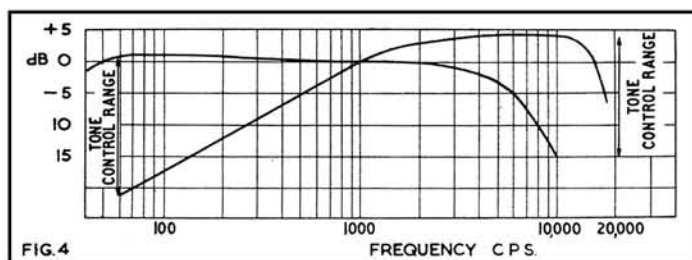
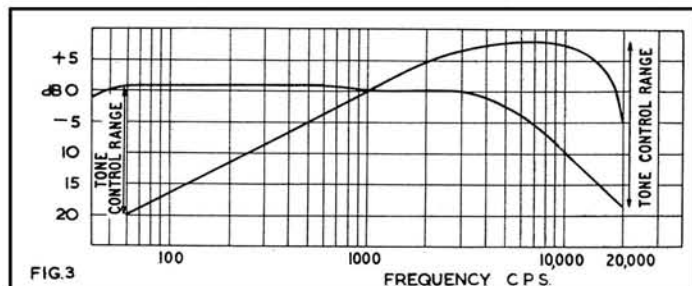
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the machine then replays the second track without the operator's intervention.

Though the wow and flutter values recorded on the TK75 are not particularly low, in all other respects the mechanical performance is about the best this reviewer has yet come across in a domestic tape recorder.

Excellent frequency response

The usual electrical tests confirmed the broad claims made for the frequency response of the TK75. When replaying commercial tapes only the replay response of a machine is involved. This is shown in **fig. 1**, the curves extending only to 10 kc/s, the limits of commercial test tapes. The curves have an unusual appearance as a result of the use of a single knob tone control, which at one end of its travel attenuates the bass response and simultaneously boosts the top response, while it performs the reverse function at the other end of its rotation. A black spot



on the tone control knob is presumably intended to indicate the setting that gives the "flattest" overall response, an assumption that the tests appear to confirm.

It is almost standard continental practice to fit an output socket providing an output voltage of about 1 volt across 10 or 20 kilohms, the signal being taken from a stage before the output valve in order to avoid the distortion that is inevitable with small tetrodes feeding a loudspeaker through a midjet output transformer. The TK75 includes such an output socket, the signal voltage being unaffected by the setting of the tone or volume controls. The replay response at this socket, using E.M.I. test tape TBT1 is shown in **fig. 2**, and it will be seen to be quite flat to all intents from 40 c/s to beyond 10 kc/s the limits of the tape. A check on the performance obtained when running tape from right to left (bottom track) showed the response to be the same as obtained from the top track to within less than one dB, over the whole frequency range.

When recording your own programme material, the combined record and replay response is the significant parameter, **figs. 3 and 4** show the combined record and replay response at tape speeds of $7\frac{1}{2}$ and $3\frac{3}{4}$ i/s, respectively. Two curves are given for each tape speed corresponding to the "maximum clockwise" and "maximum counterclockwise" settings of the tone control.

(Continued on page 499)

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

86 GNS

ELEKTRON 9/4S

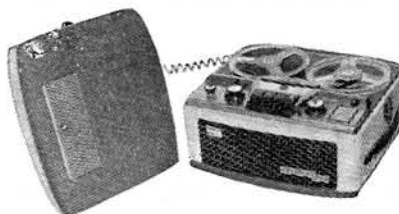
4-track, single-speed recorder ($3\frac{3}{4}$ i.p.s.) in small compact "airline" styled case. 2 15-ohm outlets; built-in speaker. Pause, superimpose, monitor facilities, etc., etc. Response 30-16,000 c/s ± 2 dB. Extra heavy motor.

77 GNS

KORTING

4-track, single-speed recorder ($3\frac{3}{4}$ i.p.s.). Telefunken heads, built-in speaker for monitoring. Response 30-16,000 c/s ± 3 dB. 5 watts total output. Superimpose, pause, etc., etc. Heavy-duty motor

68 GNS



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Saja Standard	45	6 5 0	3 8 4
Electron	47½	6 17 6	3 12 2
Wyndson Viscount	49	6 19 0	3 14 2
Spectone 161 ex Tape	49	6 19 0	3 14 2
H.M.V.	50	7 0 0	3 15 10
Telefunken 75 KB with mike	56	7 6 0	4 5 10
Brenell 3 star	58	7 10 0	4 9 0
Veritone Portable	58	7 10 0	4 9 0
Fi-Cord	59	7 19 0	4 10 0
Elizabethan Major	59	7 19 0	4 10 0
Grundig TK25*	62	8 2 0	4 15 0
Telefunken Deck with Pre-amp*	63	8 3 0	4 16 8
Philips 8108	62	8 2 0	4 15 0
Veritone Venus*	66	8 9 0	5 2 6
Kurting	68	8 8 0	5 2 6
Brenell Mk V with mic.	69	8 11 0	5 5 6
Grundig TK30*	72	9 12 0	5 10 0
Telefunken 85 3w.*	75	9 15 0	5 15 0
Telefunken 85 6w.*	79	9 19 0	6 1 8
Grundig TK35*	82	10 12 0	6 5 8
Harting HM 8	86	12 6 0	6 10 0
Sabafon Automatic*	89	13 19 0	6 13 4
Simon SP4*	95	14 15 0	7 1 8
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All machines are complete with tape and microphone, except those marked * which are without microphone.

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The results are quite remarkable, for it will be seen that there is usable response up to 20 kc/s at a tape speed of $7\frac{1}{2}$ i/s, and up to 16 Kc/s at the lower tape speed of $3\frac{1}{2}$ i/s. With such a wide range response it might well be expected that the signal/noise ratio would be low, but in fact the unweighted value was 45 dB and the weighted value nearly 50 dB on both tape speeds.

The mechanical design of the TK75 is obviously so good that it was a little disappointing to find that the RMS wow and flutter was approximately .18 per cent. at $7\frac{1}{2}$ i/s and .3 per cent. at $3\frac{1}{2}$ i/s, though both these values are within the maker's claims. Variations in wow and flutter throughout tape were low.

With such good test results, it was disappointing to find that the sound had a mummy quality. With the substitution of an external amplifier the trouble almost vanished, showing that the necessity of reducing the size of the internal amplifier had inevitably affected the amplifier performance.

After two months use the TK75 left a very good impression as a sound engineering job well above the average on the mechanical side, extremely convenient to use, and capable of above average sound quality with an external amplifier and loudspeaker.

J. MOIR.

THE TELETRON TAPEJACK

Manufacturer's Specification

Battery: 9 volt (Ever Ready PP4 or Vidor T.6004). **Battery Life:** = Shelf life. **Tuning:** fixed reception of 1,500 metres, Long Wave; pre-set reception of two Medium Wave Stations. Twin tuned circuits. **Dimensions:** $5 \times 3\frac{1}{2} \times 1\frac{1}{2}$ in. **Price:** £5 9s. including jack plug. (Battery Extra). High Gain version £6 13s. 9d.

THE Teletron Tapejack consists of a transistor AM receiver in a tuxine-covered box measuring $5 \times 3\frac{1}{2} \times 1\frac{1}{2}$ in. As received, there are attached to the receiver a 5 foot aerial wire, and a short length of coaxial cable terminating in a telephone jack plug. (Other types of plug can be fitted on request.)

A number of tapejacks already exist on the market, all being designed to enable tape recorder owners to record radio programmes without the need for a complete broadcast receiver. A special feature of the unit under review is that it gives pre-set reception of three stations, there being a 4 position switch for Medium Wave 1, Medium Wave 2, Long Wave and Off. The signal from the aerial passes through a high Q Ferrite-core input coil to an RF transistor. This gives some degree of amplification, and is followed by a crystal diode detector which feeds the co-axial output cable.

The Long Wave position is pre-tuned to the Light Programme wavelength of 1,500 metres, which provides a strong signal over wide areas in the Midlands and other parts of the country. The Medium Wave positions are designed to cover the ranges 200-300 metres and 300-550 metres respectively. The Tapejacks are despatched with these tuned to the Light Programme (247 metres) and Home Service (330 metres) which suit the London area, but every purchaser will undoubtedly wish to check the tuning for himself.

Adjustment is by the usual type of "trimmer" capacitors familiar to all amateur radio enthusiasts, and, as they will know, the operation is easy enough, but requires a little patience. One of the sixpenny screwdrivers with insulated handles makes an excellent tool, or there are proper trimming tools which introduce the minimum stray capacitance while tuning. You should adjust the two capacitors for the given switch position (aerial, and detector) alternately by small amounts until the desired station is giving maximum signal.

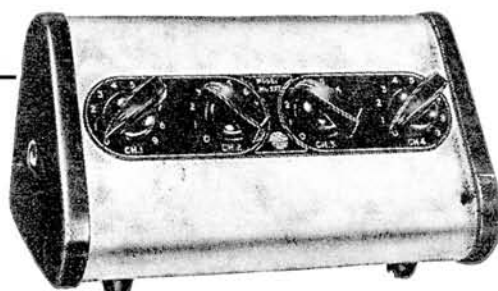
With the aerial supplied, fairly good programme strengths were obtained on a number of foreign stations, as well as the BBC and Radio Luxembourg. Attaching a loft aerial improved things considerably, but intending users would be advised to try the performance in their own neighbourhood before purchase. An improved model is available which incorporates a built-in preamplifier.

The point at which the Tapejack is plugged into the recorder—the High Impedance Microphone Socket—is fortunately common to practically all machines, and no modifications will be necessary.

J.N.B.



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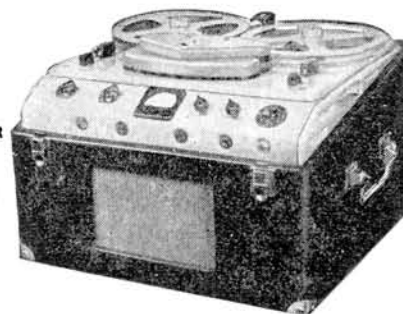
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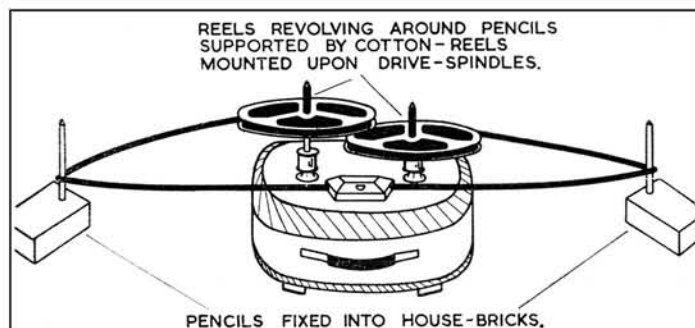
*We have awarded a prize of one 5-inch spool of tape to the first letter printed below. Letters not intended for publication should be clearly marked.

. . . about playing large spools

From:—Kenneth G. Towes, 41 Barnwood Rd., Gloucester.

Dear Sir:—It is almost certainly bound to happen one day sooner or later that the owner of a tape recorder suddenly finds himself in possession of a reel of tape to listen to which is far too large for his particular machine to accommodate. Usually the only solution that he can resort to in the emergency, short of soliciting the help of someone else who owns a bigger tape recorder, is to cut the tape into two separate lengths and listen to each piece before laboriously splicing the whole thing together again afterwards.

I have recently been confronted with just such a dilemma, and give here the very simple idea that I utilised that completely dispensed with any such difficulties. This invention has proved



absolutely faultless and completely effective in such cases. It is now possible by its use to reproduce and record upon any tape whose diameter exceeds the size that my tape deck was designed to accommodate.

Two cotton-reels, each containing a pencil gripped within their centre holes, are simply fitted over the supply and take-up reel spindles on the tape deck. An empty take-up spool of the same size as the reel about to be played is then fitted over that pencil which is being supported on the normal take up spindle, and secured to the cotton-reel with a pin inserted through one of the locking holes on the reel.

The reel of tape which is to be played or recorded is then similarly placed over the pencil fitted on to the other spindle, and prevented from slipping down on to the take-up reel by an elastic-band wound tightly around the pencil. The two reels are now perfectly mounted on the tape deck in a position which enables them both to revolve freely without obstructing each other.

All that remains now is for the tape to be laced up. And in order to introduce the tape smoothly into the sound-channel it is merely necessary to procure two more pencils and arrange for

(continued on page 503)

TAPE RECORDS REVIEWED

THE tape records in the following paragraphs are from the EMI catalogue of Columbia and HMV labels, and are on 7-inch spools unless otherwise noted. All are recorded at a speed of $7\frac{1}{2}$ i/s. Stereo tapes are indicated by the prefixed "**."

Light Orchestral

** **The Music of Eric Coates** (vol. 1). Comprising: *The Three Bears*; *By the Sleepy Lagoon*; *Queen Elizabeth March*. Played by the London Symphony Orchestra, conducted by Charles Mackerras Columbia stereo tape BT 705. Price 44/-.

This tape was released as long ago as August 1957; and for that very reason we print this reminder that it is an outstandingly good one. "Pop" discs have a very transient life in a catalogue. "Classics" are as good after five years—possibly ten—as on their date of release. All these tunes are evergreens. Eric Coates is quoted as having said that "*By the Sleepy Lagoon*" brought him enough, in annual royalties, to provide a living regardless of all his other music! An extremely lively and well-recorded tape, and good stereo value.

** **Philharmonic Pops**. Comprising: Tchaikovsky's *Polonaise* from Eugene Onegin. J. S. Bach's *Air* from Suite No. 3 in D. Rimsky Korsakov's *Flight of the Bumble Bee*. Brahms' *Hungarian Dance No. 1*. *The Londonderry Air*. Lehar's *Merry Widow Waltzes*. Kreisler's *Tambourin Chinois*. Liszt's *Etude de Concert No. 3* in D flat. Waldteufel's *Skaters Waltz*. MacDowell's *To a Wild Rose*. Offenbach's *Gaieté Parisienne*, No. 16. The Orchestra is The Sinfonia of London, and the conductor is Robert Irving. HMV stereo tape SCT 1525. Price 55/-. Playing time, 46 minutes.

Practically every concert-goer must have at least one favourite among the above list; and it is a safe bet that *Londonderry Air*, *Skaters' Waltz*, and *Bumble-bee* have a place in nearly every home. The last of these three is most delightfully played here, with the "bee" represented by the harpsichord (George Malcolm). They are all good numbers, and the recording is excellent.

Popular

Yesterdays—"The Man with the Golden Trumpet" (No. 2). Comprising: *Yesterdays*; *Confessin'*; *I'm getting sentimental over you*; *Maybe*; *As time goes by*; *You go to my head*; *Imagination*; *Mean to me*; *Poor Butterfly*; *In the still of the night*. Played by Eddie Calvert, with Peter Yorke and his orchestra. Columbia tape CDT 862. Price 55/-. Playing time, 33 minutes.

If you like the trumpet you cannot fail to like this tape. If you do not like the instrument as a solo, do not buy it.

Opera

Hansel and Gretel: By Humperdinck. Sung in German, and starring: Elisabeth Schwarzkopf (*Gretel*); Elisabeth Grümmer (*Hansel*); Josef Metternich (*Father*); Maria von Ilsovay (*Mother*); Else Schürhoff (*Witch*); Anny Felbermayer (*Sandman* and *Dew Fairy*); The choirs of Loughton High School for Girls and Bancroft's School provide the choral singing, and the orchestra is the Philharmonia, conducted by Herbert von Karajan. Two Columbia Tapes. Price 84s. Total time, 1 hour 43 mins.

This is another recording from our library, and deliberately dug out for a second airing. It is a plum, albeit an expensive one! It is also rather a difficult plum to divide, for whichever of the two tapes you might buy, you would most certainly want the other immediately. This is not the first *Hansel and Gretel* recording (though it is the first on tape), and there will undoubtedly be others, but it is difficult to foresee a much better recorded performance than this—and the recording itself is, again, in the "excellent" class. The work, for those who have not heard it as a complete performance, may definitely be classed as "light operatic", midway between operetta and opera. Its tunes are based on German folk tunes, and they are delightful. Singing and orchestral playing are superb.



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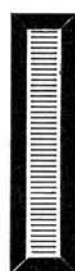
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Collaro 4T200	18	13	0
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*Grundig TK35	82 gns.		
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READERS' LETTERS—(continued)

them to be supported firmly and rigidly in line with the sound-channel, one on either side of the tape recorder about 18 in. away from each side.

I used two ordinary house-bricks with holes drilled in each one to support these two pencils. The tape is then led from its reel on to and around the left hand pencil, through the sound-channel and then on again to pass around the other pencil and lastly, of course, fastened in the normal way to the take-up spool. The whole machine can then be set into operation; each reel feeding and taking up the tape entirely unhindered.

This method described is, of course, only suggested for use during an odd emergency. It is not recommended that such a system be put into constant use. *Yours truly*

* * *

... about holding the pause control

From:—A. G. Adams, 3 Rufford Road, Cleethorpes, Lincs.

Dear Sir:—I wonder if any of your readers who use the Collaro Mk. IV deck have, like me, been inconvenienced by being unable to apply the "pause" and leave it "on"? I enclose a

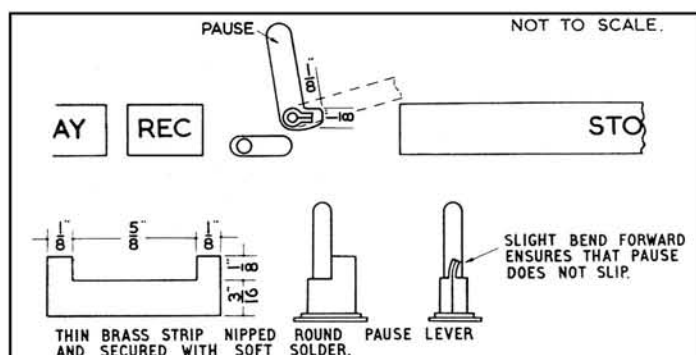


diagram of a simple modification which has served me well for over six months, and needs the minimum of skill to perform: the only material being two top strips from a cycle lamp battery.

There is sufficient play in the fitting of the pause control to allow it to be lifted the necessary $\frac{1}{8}$ in. to engage the catch in the slot cut in the plastic cover. *Yours faithfully*

* * *

... about our October cover

From:—J. Moss, 21 Glanville Road, Bromley, Kent.

Dear Sir:—This is to say firstly that I enjoy reading *The Tape Recorder* more with each issue, and think it is by far the best tape magazine published. But PLEASE, NO MORE of the stupid, so-called glamorous cover pictures as on the October issue. If I want this kind of thing there is already an abundance of eye-catching literature on the bookstalls. If you credit your readers with average intelligence and a keenness for the genuine thing, as indeed the mag contents show, then please treat your covers in the same way and keep sex out of it. *Yours faithfully*
P.S. My wife is trying hard to understand my enthusiasm for anything to do with sound, and lately I have had some success in putting over my point of view. The picture on this issue has now set me back about three months and anything to do with "tape" is now back in the dog house!

* * *

... about reading the correct service manual

From:—D. J. Milne, Service Manager, Collaro Ltd.

Dear Sir:—We refer to a letter published on page 377 of the October issue of *The Tape Recorder* written by Mr. J. L. Smith of 21 Nutholt Lane, Ely, Cambridge.

Mr. Smith states that he could not adjust the pressure roller by a cam, sited to the left of this roller, as no such cam was provided. All Mk. III and Mk. IV Tape Transcriptors are so fitted and we must presume that Mr. Smith owns an earlier Mk., probably a Mk. II, and has been referring to a Mk. III or a Mk. IV service manual. *Yours faithfully*

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Advertisements for this section must be pre-paid, and accompanied by a postal order, money order, or cheque, made payable to "The Tape Recorder", 99 Mortimer Street, London, W.1. They must be clearly written or typed, and must be in the form of a separate sheet of paper if included with a letter dealing with other subjects.

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

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

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PUBLISHER'S ANNOUNCEMENT

A GREAT number of letters reach this editorial office each month about reprints, binders, booklets, bound volumes, etc. To save our readers unnecessary trouble and (in the case of our overseas readers) long delays, we publish the following details about the items mainly concerned.

"Hi-Fi News" Vol. 3 Bound Volumes

These are available from stock, in maroon buckram covered board covers, gold blocked on spine. The period covered is June 1958 to May 1959, plus annual index. The price is 52s. 6d., post free.

"Hi-Fi News" Vol. 3 Semi-Bound

These are also available from stock. The contents are as above, but the numbers and index are in stiff covered string "loose leaf" binders. The price is 42s. 6d., post free.

Binders for "Hi-Fi News" Vol. 4

Binders for the current volume of *Hi-Fi News* (Vol. 4) are also available from stock. The colour is our standard maroon, as in the above item. The binders allow numbers to be opened flat at any page, and accommodate 12 numbers plus index. The price is 13s. 6d. post free.

"Hi-Fi News" July Numbers

Owing to the breakdown in distribution caused by the printing strike, many regular readers missed their July numbers. Copies of this number are available, price 2s. 6d., post free.

"Hi-Fi News" Vol. 3 Index

Readers who file their copies of *Hi-Fi News*, and who require a form of easy reference to the contents, may obtain Indexes to Vol. 3 and also to previous volumes, price 2s. 6d. post free.

Decca Corner Speaker Reprints

A big demand for back numbers containing this feature has exhausted supplies. The constructional details are now being prepared in reprint form, and this reprint will be available on December 1st. Price 1s. 6d., post free.

S.P.1 Stereo Pre-Amplifier Reprint

Copies of this reprint—complete constructional details for the *Hi-Fi News* high-fidelity stereo pre-amplifier, designed by H. Lewis York, are available from stock, price 3s. 6d., post free.

How to Splice Tape

Copies of this booklet are now available. Large stage-by-stage photographs and detailed captions and text, cover the complete subject of tape splicing and editing. Price 2s. 6d., post free.

"Hi-Fi Books" in Preparation

Following our previous announcements, many readers have written in requesting that their names be added to our mailing list for additional details of forthcoming "Hi-Fi Books". The first two titles were unfortunately delayed as a result of the strike, but are now due for early publication. They are:

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"Hi-Fi Year Book"

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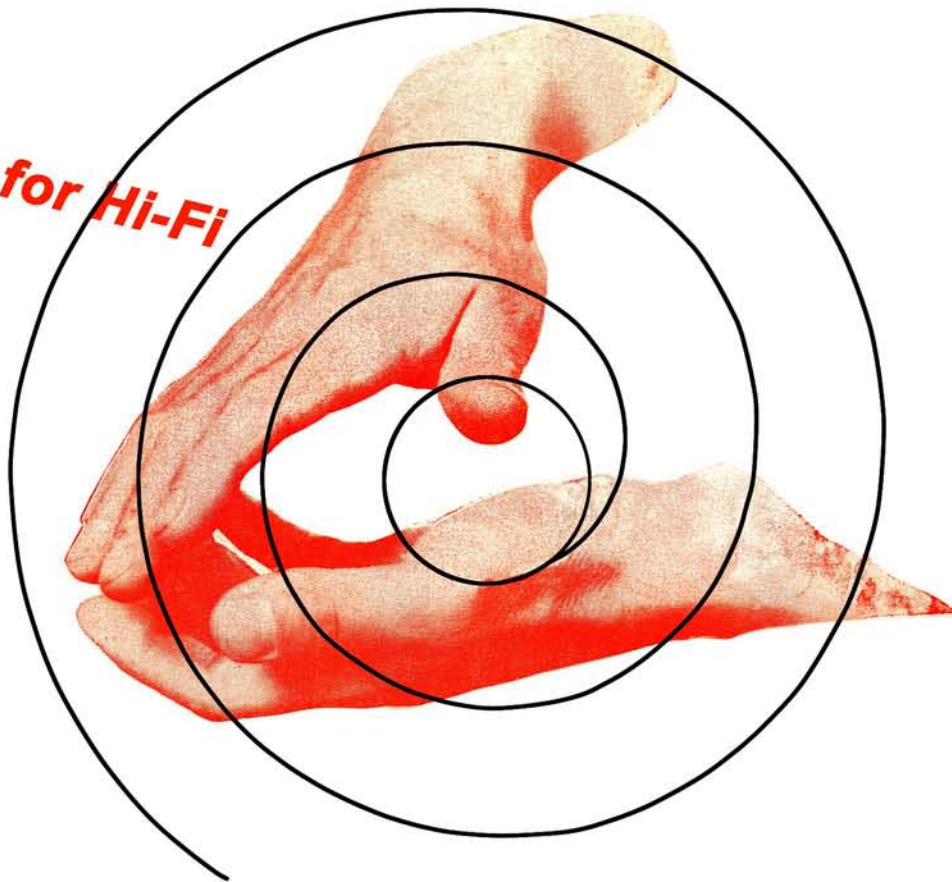
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