

the TAPE RECORDER

PRICE 1/6

May 1960

Vol. 2 No. 4

INCORPORATING "SOUND AND CINE"

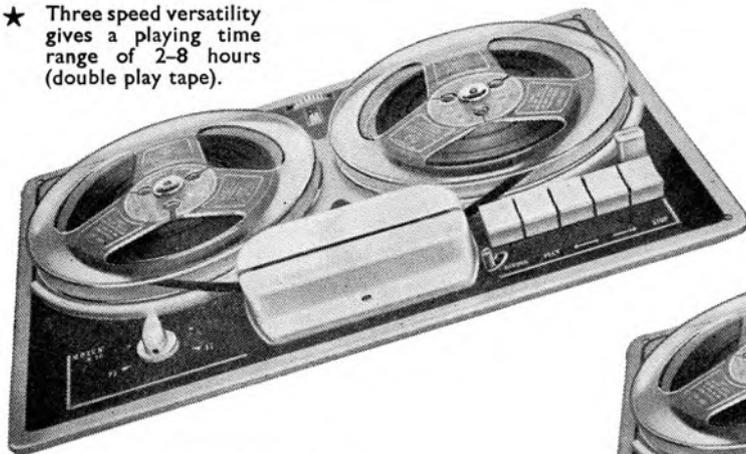


IN THIS NUMBER

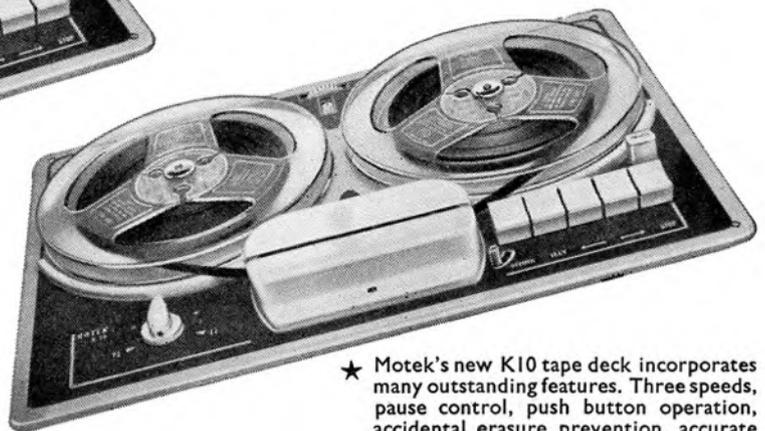
- New Tape Recorders and Accessories at the London Audio Fair
- Building and Using a Parabolic Reflector
- Field Trial of the Stuzzi-Magnette Portable Recorder
- Curing TV Interference
- Tape Recorder Workbench
- Club Notes and News
- Equipment reviews
- Readers' problems
- Tape and Cine

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

- ★ Three speed versatility gives a playing time range of 2-8 hours (double play tape).



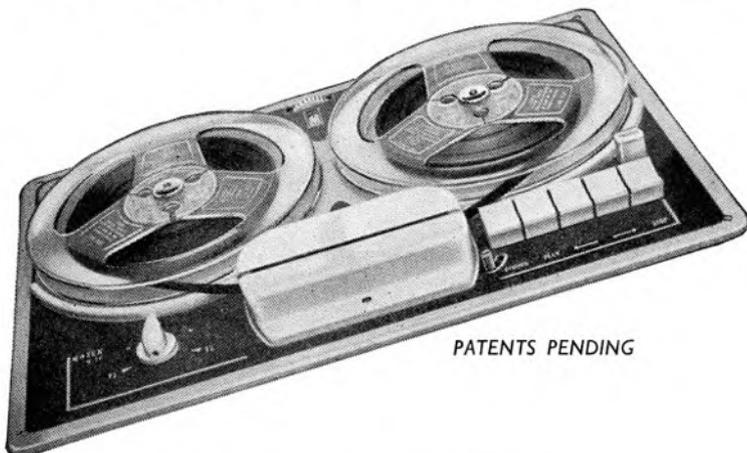
- ★ Improved record/playback head gives frequency response from 40 c/s-12,000 c/s at 7.5 i.p.s. Precision balanced flywheel and capstan assembly reduces wow to a minimum.



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

21 GNS

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



PATENTS PENDING

More and more manufacturers are incorporating the new Motek K10 tape deck in their machines. Motek's quality and reliability make Motek the first choice of manufacturers and enthusiasts.

**MODERN
TECHNIQUES**

Write for the Motek K10 leaflet

Wedmore Street, London, N.19

Tel.: ARChway 3114

LISTEN BEFORE YOU LEAP



THOSE of us who know little about decibels and flat frequency responses might not raise our eyebrows at the facts and figures describing the much-talked-about new WyndSOR "Victor" portable. Those who are genned up to translating the specification into words and music are not surprised that the "Victor" sounds better than some tape recorders nearly twice the price. But make no mistake if you are about to plunge: the WyndSOR "Victor" is a quality-all-the-way portable, so beautifully designed and executed as to bring professional-sounding recordings within the reach of the most non-technically-minded amongst us.

Mark these following features and ask yourself how does WyndSOR do it at the price.

* frequency responses:—

7½ i.p.s.—50 to 15,000 c.p.s. better than ± 3 dB.

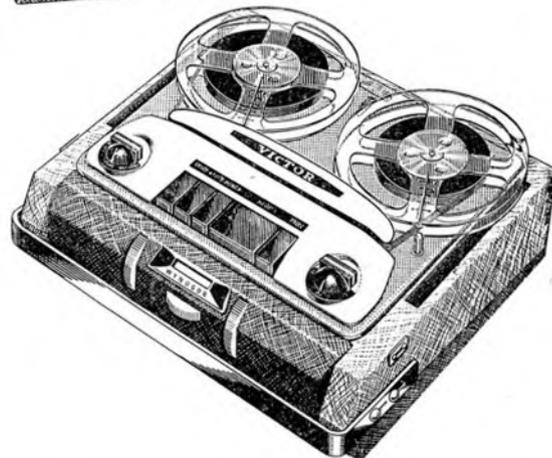
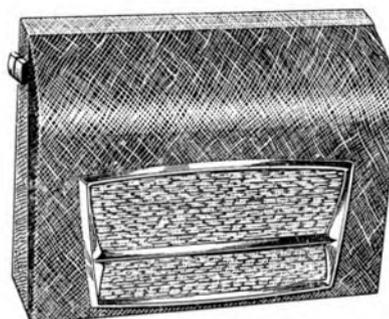
3¾ i.p.s.—50 to 9,000 c.p.s. better than ± 3 dB.

1½ i.p.s.—50 to 5,000 c.p.s.

- * full frequency equalisation at all speeds.
- * 10" × 6" elliptical speaker in detachable lid.
- * up to 8 hours playing time on one D.P. tape.
- * monitoring through its own speaker with independent control.
- * finger-tip controls closely grouped.
- * mixing facilities for mic and gram/radio inputs.
- * additional output with automatic speaker cut-out.
- * facility for use as an amplifier.
- * three independent 4-pole motors.
- * unique styling in two-tone grey with gilt fittings.
- * twin tracks * pause control * tone control.
- * guarantee: 12 months (valves 90 days) and the name of WyndSOR.

And how do they do it? By the experience that ten years manufacture of quality tape-recording equipment only can bring. By design-creation only after intensive market research and nation-wide trade inquiries, so that WyndSOR tape-recorders virtually sell themselves, without sales-force, without large advertising campaigns, without exhibiting at you-know-where, and with minimum servicing requirements after sales. All these overheads are conspicuous in the price by their absence.

If history is anything to go by, widely publicising the "Victor" would overwhelm the WyndSOR factory. WyndSOR policy is never to sacrifice quality for quantity and the fact is that there were never enough of the "Victor's" predecessor, the "Viscount", to satisfy the demand. So now is the time for all good enthusiasts to inquire at WyndSOR dealers or to send postcards (clean variety still preferred) to the modestly proud makers for the names of nearest stockists. There is nothing more annoying than hearing a WyndSOR just after buying an ordinary tape recorder.



The WyndSOR "VICTOR" complete with crystal microphone, 1,200 feet of tape, and a spare jackplug, is only 45 guineas

WYNDSOR RECORDING CO. LTD.

(Contractors to H.M. Government)

**WyndSOR Works,
2 Bellevue Road,
Friern Barnet, London, N.11**

Telephone: ENTerprise 2226/7

Telegrams: Wyndreco, London

Two Years Guarantee

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

MODEL R 30/R 40

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



TECHNICAL SPECIFICATION

The R.40.

$1\frac{7}{8}$ ips 70—4,500 \pm 3dbs.

$3\frac{3}{4}$ ips 60—9,000 \pm 3dbs.

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

15 ips 40—20,000 \pm 3dbs.

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

Separate record amplifier.

Push-pull bias erase oscillator for low tape hiss.

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

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

FURTHER FACTS

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

MODELS

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

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

★

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

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

Fully illustrated literature available on request to—

REPS (TAPE RECORDERS) LTD.

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

Phone: Acorn 4141

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

Mr.....
.....
.....

the TAPE RECORDER

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★

EDITORIAL

AS noted in the Editorial column of our sister journal, *Hi-Fi News*, the Calendar has its dates set against this year when it comes to reporting the London Audio Fair. This May Number is scheduled for delivery almost as the exhibition doors open at the Russell Hotel, owing to the dates of the Easter Holiday. It will therefore be impossible for us to carry any news reports of the Fair until our June number is published (see date below), and this means an inevitable time-lag of some three weeks. We are very sorry, but there was nothing we could do about it!

We also take this opportunity for announcing that "Hi-Fi Year Book" will be available at the end of April (a few days after the publication of this number of *The Tape Recorder*, and will not be on sale at the time of the Audio Fair, as has been customary in recent years. The decision to defer publication by one week was primarily a "defensive measure". Each year, since 1956 when it was first published, we have endured a period of editorial torment, waiting for Budget Day to see whether the Chancellor of the Exchequer had sabotaged months of painstaking work by a few crisp words on Purchase Tax. Though all U.K. Tax figures in *Hi-Fi Year Book* are given separately, for the particular benefit of our readers who escape them, any tax "adjustments" could easily render complete Directory Sections useless in terms of price information, and could cause both dealers and customers unlimited trouble throughout the year. Last year we were caught napping, but fortunately the reductions in Purchase Tax were on an overall percentage basis which made it possible to calculate the changes. This year, we are glad to note, there were no changes.

New models of tape recorders were still being announced as our final pages of *Hi-Fi Year Book* were amended for press; and so a useful point has been gained by our revised publication date. As the Year Book now appears, we think that it represents the most complete and up-to-date survey of the market that it is possible to offer. Some idea of the growth of the industry can be gained from the fact that we have had to increase the sections dealing with tape recorders from 30 pages last year to 40 pages in this 1960 edition, excluding the pages which deal with tapes!

With this annual survey we have thus been able to bring the picture up to date, as it appeared at mid-April 1960. With regular monthly reports in *The Tape Recorder* we hope to keep all our readers posted with accurate information on all new products, so supplementing the basic information contained in *Hi-Fi Year Book*. In the meantime, please await the report of any Tape developments that are unleashed at the Audio Fair. You will find all the details in our June number!

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COVER PICTURE

SOUND, as applied to cine, is ideally covered by our front cover this month, and in scenery and weather which should not now be more than a few weeks off! The apparatus in use on this location makes a fine combination—given the interest and the £. s. d. wherewithal. Bolex 16mm camera with variable speed shutter and reflex viewing. EMI battery driven portable, model L2. This is, in point of fact, the identical equipment used by the author of the present series in *The Tape Recorder*, though the picture is of the Kinocrat film unit who have recently made many successful 16mm documentaries.

NEXT MONTH



THOUGH delayed, as explained opposite, our *Audio Report* will be appearing in the June number. The other main features will include a further instalment of James Moir's series *Reviewing Tape Recorders*, Part 4 of E. D. H. Johnson's series on *Parabolic Reflectors*, *Tape Recorder Workbench*, Reviews of recorded tapes and equipment, and *Readers' Problems* answered. All the usual features will be there, including pages of news and pictures, and a further article in the popular series "Sound and Cine". In view of rapidly increasing sales, do please place a firm order with your supplier and so avoid disappointment.

The Tape Recorder for June—On Sale May 27.

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).



HERE AND THERE AND EVERYWHERE

The picture on the left shows Mr. H. U. Meier, Paris Correspondent of Radio Berne, with the Nagra portable which he uses for his reporting. His tapes are mailed or flown to Berne, where they are edited and used for broadcasts. As noted in the news story below, tape has yet to "catch on" in France, where its popularity is virtually negligible, compared with the tremendous interest in the U.K. The 1960 Hi-Fi Year Book has had to increase its Tape Recorder sections by many pages in order to take in all the new models. Pages 174-175 of this magazine are also devoted to new instruments.

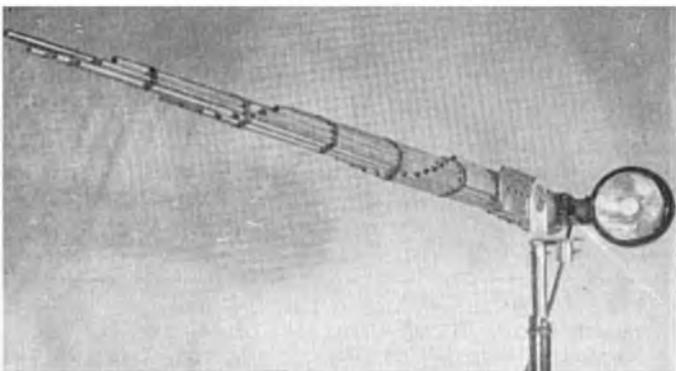
THE second annual "Audio Fair" was held in Paris at the *Palais d'Orsay* hotel from Friday to Wednesday, March 18th to 23rd inclusive. It differed from our London Audio Fairs in several major respects. First, it opened each day at 5.00 p.m. and closed at 10.00, with the exception of Saturday and Sunday, when it opened at 3.00. Second, instead of our "booth system," in which the main exhibition hall is divided into individual units, the static exhibits at Paris were right around the walls of the large hall (one-time ballroom) with no attempt at partitioning. Third, so far as the primary interest of this magazine is concerned, tape exhibits were a long way down the scale of popularity.

Tape has yet to catch on

Tape recording has yet to storm the French bastions. What we saw there was very good, but there was very little of it. Philips and Grundig were well represented, of course, on their usual international basis; but the British makes seemed to be limited to Simon and Vortexion. However, at this point on the popularity graph, it would probably be too early for any large scale plans for invasion! T-Day is still in the future in the Frenchman's heart. He is far more concerned to learn about the mysteries and the advantages of "Hi-Fi"—or, as he pronounces it, "Hee-Fee".

Other makes of recorders on view included the American *Webcor*, and (unknown to our market) the *Filson-Epsilon*, *Melovox*, *Berlant*, *Polydyne*, and *Wollensak*. MSS tapes were prominent.

The most interesting "tape applications" in the whole exhibition



Can you guess what this is? If not see page 173.

were in reporting. Journalists used them. The television division of RTF (the French BBC) used them, in conjunction with cameras, for collecting material for the TV broadcast about the Exhibition. So did a representative of a South American broadcasting organisation. So did Radio Berne, the Swiss organisation.

Some details of the Nagra

Our photo shows Radio Berne's Paris reporter with his portable *Nagra*—a very neat and versatile instrument which is deservedly most popular for this type of work. It measures about 1 ft. × 6 ins. × 4 ins., takes 5-inch spools, records at 7½ i/s, replays through built-in speaker or via a speaker outlet, incorporates a level meter—and is clockwork driven. One winding seemed to last for about 4 minutes, which is ample for average reporting. The quality of the sound is excellent.

It was a good show. Its full and correct title: "*Festival International du son, Haute Fidelite, Stereophonie*".

Royal microphones

MANY readers must often have wondered, as we have, about the microphones used for Royal Occasions. What are they like? Who makes them? How have they changed with the passing years and the rapidly moving technical progress? Many of these questions were answered unexpectedly for us by the arrival of a photograph from EMI, which was taken at the recent conference of Public Address Engineers. There, some of the specially made, personal microphones, used by members of the Royal Family, were displayed. It was the first time for many years that the beautifully finished instruments had been seen together, and we have great pleasure in reproducing the photograph here.

With each microphone is an engraved silver plaque giving details of the ceremonies for which it was used. In the centre, at the back of the display, is the earliest microphone made for King George V. Beside it, to the left, is its decorated, protective outer case. Was it perhaps from this microphone that some of us, as children heard that fine regal voice announce: "...I declare this Exhibition Open..." from Wembley in the middle twenties? Then, to the left again, is the model which superseded it; and opposite, on the right, is Queen Mary's microphone, from which that also much-loved voice used to reach us.

In front are the microphones of another Royal generation—on the left, that of the present Queen Mother: on the right,

HERE AND THERE AND EVERYWHERE *cont.*

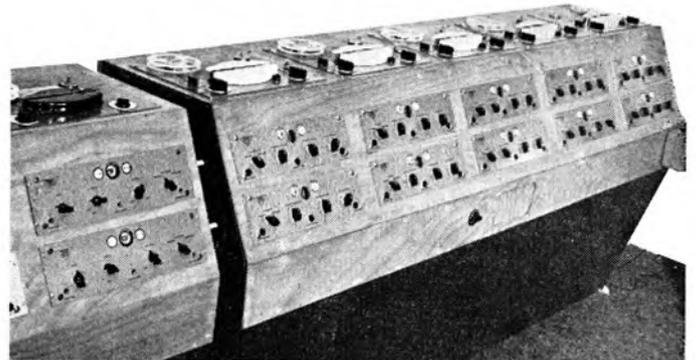
that of the late King George VI. This is indeed an historic and unique collection; and, thinking back over the years, what memories of great occasions these instruments bring back. They are now in the care of The Gramophone Company Ltd., at Hayes, Middlesex.

Religious Talks—On Tape

THE demand for religious talks, for broadcasts and for mailing to individual people, groups and societies, is growing very rapidly—so much so that the copying of the tapes has proved a serious problem to some religious bodies. To give an idea of the size of the job that faces one such body, refer to the photo on the right. It shows a part of one console of a pair, built by a firm of Blackpool engineers for multi-channel high-speed copying. The firm, Benfell Limited, have built in five Brenell decks and ten amplifiers to each console. All decks can be stopped and started together.

Double Speed—Both Tracks Together

The master recordings are first made at the $7\frac{1}{2}$ i/s speed, and in the standard, 2-track sequence, i.e. top track first, then turn for second track. But by using "stereo" recording on the copying "slave machines" of the consoles, the duplicates are copied in one session—top track forward, lower track backward. Double-speed copying is achieved by replaying the $7\frac{1}{2}$ i/s master on a master stereo instrument running at 15 i/s. It is the outputs from the two tracks at 15 i/s which are fed, stereo-wise, to the slaves; and the speed of the recording slaves is $7\frac{1}{2}$ i/s. Thus, with two consoles running together, each with five decks, ten tapes are copied at each operation; and the resultant tape speed is, of course, $3\frac{1}{2}$ i/s—the speed which is found on nearly all recorders in all countries.



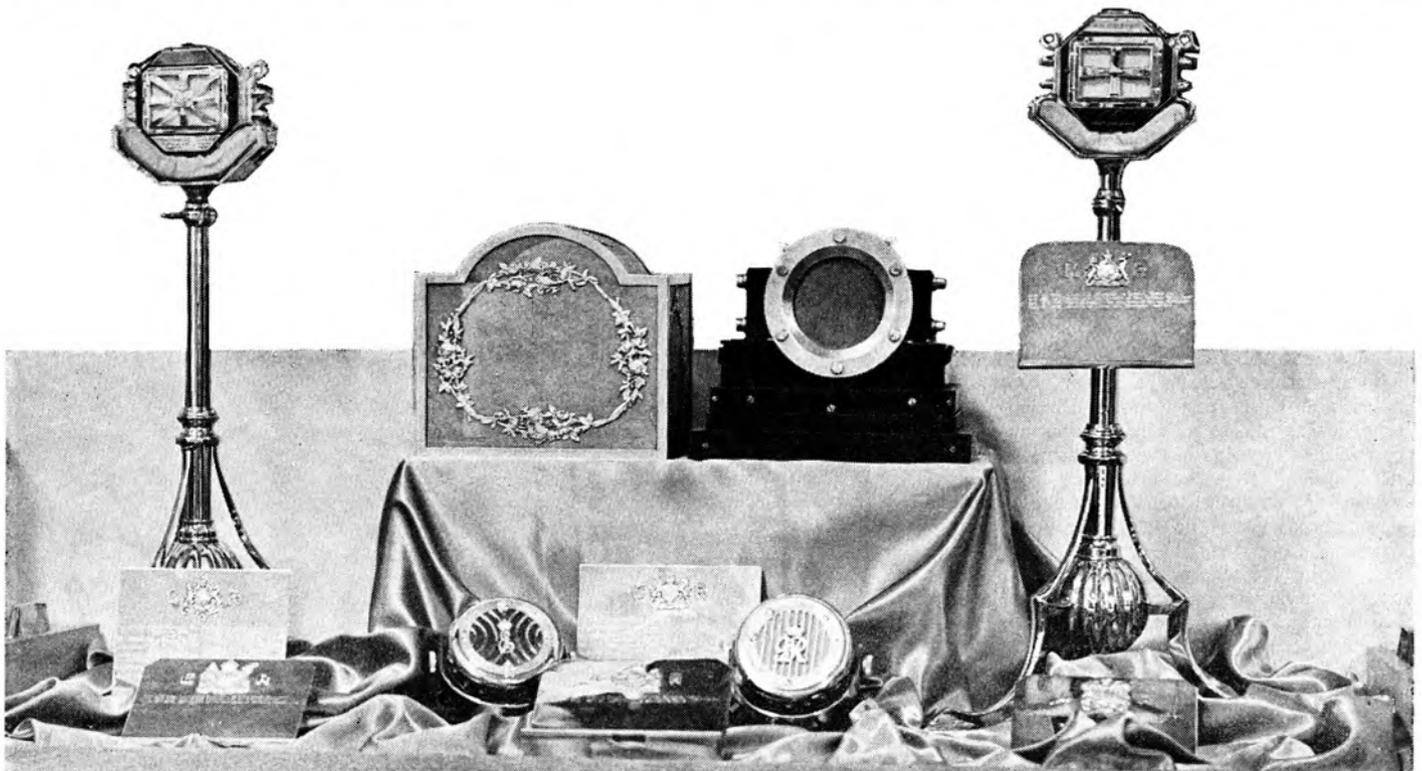
A section of the 2-console tape-copying installation built by Benfell Ltd., of Blackpool. Each console comprises 5 Brenell decks, and 10 amplifiers.

Do not Miss This at the Fair!

ONE of the tape highspots at the Russell Hotel is likely to be the first showing of the International prizewinning documentary colour film, *The Magic Tape*. Made specially for BASF, it won 1st prize and 3 awards at Berlin, and an 'oscar' at Rouen. It runs for 30 minutes.

E.A.P.—Wrong Price.

E.A.P. Tape Recorders ask us to point out an incorrect price in their advertisement on page 114 of the April *Tape Recorder*. The correct price in 65 guineas, and *not* 59 guineas as stated.



TAPE, AS OTHERS ARE USING IT



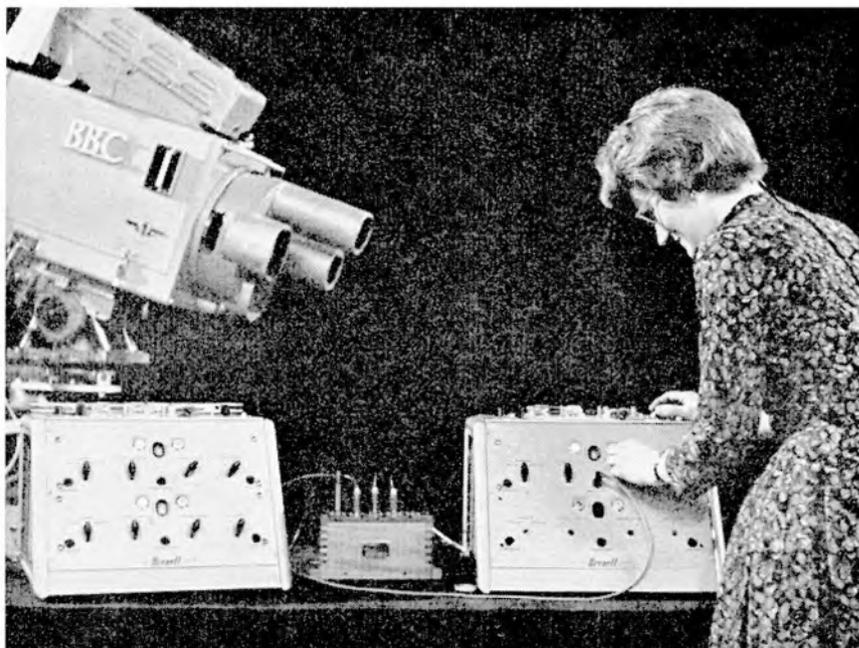
Listeners to Radio Luxembourg will know the EMI programme and that company's new vocal group, the England Singers. Here they are (left to right) Hazel, Julie and Betty, with disc jockey Ray Orchard, plus a Clarion, making a personal recording for friends back in Yorks.

Talking Book Supplement

NEWS of a very bright idea has just reached us from Amsterdam. It is a "talking supplement" to a recently published encyclopaedia. The author, Mr. van de Werken, decided to illustrate his work with animal pictures, but went a stage further and published their voices as well! With camera and Grundig TK 30 he visited the animals and recorded them. When he had collected sufficient material, he edited the tapes and had a disc made. This was then pressed in the normal way, and packaged to go out with his book. The name of the work is the "Artis" Encyclopaedia. Two of the photographs are reproduced on the opposite page, and show the author at work interviewing a nest of guinea pigs and a member of the Cat Family. Readers of our sister Journal, "Hi-Fi News", will find another study on the front cover of the May number.

Tape and Electronic Music

DAPHNE ORAM, one of the judges in our New Music competition, and one of the country's leading lights in the comparatively new field of electronic music, recently gave television viewers a chance to see a few "trade secrets" when she appeared in the BBC *Sound in Vision* programme. Many of our readers doubtless watched this fascinating subject, but for the benefit of those who missed it, here is a picture and a few notes about the programme. Brenell Mk. 5 tape decks, plus a variety of capstan sleeves, enable her to obtain the very small changes of frequency that she often requires for her work. She showed the use to which everyday sounds can be put for constructing *Musique Concrète*. Sine waves, Square waves and White Noise are also used, as produced by electronic generators. These audio sounds are then slowed down, speeded up, superimposed on one another, cut, re-pitched, blended and edited. Three tape decks are normally used, but sometimes even more are necessary. Daphne Oram has made this her career, and has produced many successful sound tracks for documentaries and TV programmes.



Tape Club News

Mr. L. Summerfield Turner has been appointed Secretary of the newly formed **Bedford Tape Recording Group**. Although the group has no formal club organisation such as a committee or subscriptions, it is organised to carry on all the normal functions and activities of a tape recording club. Their first objective is the development of a personal message service at the Bedford hospitals, and they are well on the way to achieving this. However, they would like some assistance, and a few more machines with varying speeds and portability. So if any Bedford tape recordist would like to join in and help, would they please write or 'phone the secretary at 131 London Road, Bedford. Tel.: Bedford 68537.

At the last meeting of the **Bournemouth & Poole Tape Recording Club**, a tape from club member Anthony Townsend was played. Mr. Townsend has the enviable job of working on a private yacht in Monaco and the coloured slides he sent along with his recording did much to enhance the sound picture. During the same meeting, a tape entitled "Mrs. Doll's Diary"—the daily happenings of a fireman's wife—was enjoyed by members. Although this was their first attempt at recording, we gather that Mr. and Mrs. K. J. Ward made an excellent job of the production. The first club dinner and dance was held on March 29th and proved so enjoyable that it was decided to make it an annual event.

The redoubtable Henry Hopfinger of the **Coventry Tape Recording Club** is to be congratulated on increasing the number of club members by distributing leaflets among retailers in the town. Henry came to the fore again when his Telefunken was used to record a tape to send to the San Francisco Tape Recording Club. Club members were recently invited to meet, and interview, four Cuban journalists who were visiting the city. They chatted and exchanged views for about twenty minutes, and once again it fell upon Henry's shoulders to take care of the recording. A directory of members for 1960 is to be issued in the near future, and as well as names and addresses, details of equipment owned by each person will be given.

TAPE, AS OTHERS ARE USING IT *Cont.*

The **Middlesbrough Tape Recording Club** have now taken over their own room at the Middlesbrough Settlement Community Centre. Plans include dividing the room into a workshop and studio, and these premises will be available between Monday and Friday. Since October 1959 the Hospitals Group have produced a monthly programme and "broadcasts" to one hospital have been achieved using the existing radio relay circuit. This is a trial service and it is hoped to serve all the local hospitals by means of the closed circuit of a local radio relay firm. Current activities have included a demonstration of 4-track stereo and monaural recorders by Mr. Buckingham of Technical Suppliers Ltd., talk on power packs by club Chairman Don Allison, and a feature tape on "Our Town."

Corporal Pete Rogers has been appointed new Secretary of the **R.A.F. Tape Recording Society** due to the demobilisation of Mr. R. L. Restall. Since the Society was founded early in 1959, membership has grown to nearly fifty strong, with members stationed throughout the world—from Australia to Singapore. Membership is open to all ex-members and serving ranks of the R.A.F., the Commonwealth and N.A.T.O. Air Forces, and at present there is no subscription fee. One member, Mike Beville, owns a small printing press and professional disc-cutting machine, and has offered both services to members. They are hoping to start their own hospital service soon and tie up with other societies doing the same good work.

Our good wishes for a speedy recovery go to Mike Brown, Secretary of the **Rugby Amateur Tape Recording Society** who was recently confined to hospital.

Visiting members of the **Stoke Newington Club** joined the **Walthamstow and District Tape Recording Society** on a "Night out" at the Walthamstow bus and trolley depot, where they interviewed drivers, conductors and maintenance men about the changeover from trolleys to the new Routemaster vehicles. A detailed account of the occasion appeared in the Walthamstow Post. A copy of this tape is to be given to the borough library for their records.

At their last meeting, the **Warwick and Leamington Amateur Tape Recording Society** entertained members of the Coventry Tape Recording Club, and the presentation of competition tapes of *Musique Concrète* formed the major item in the programme. Six tapes were submitted for the competition and the judge, Mr. Tyson, M.Brit. I.R.E., considered Mr. Terry Draper's to be the best. He was awarded the Society's silver cup (donated by Mr. T. Wells), and a spool of magnetic tape. To make his prizewinning tape, Mr. Draper had combined parts of the sounds made by his two young children striking an empty vase and a champagne glass, the ticks of two clocks, and a few notes from a music box. Then, by careful rhythmic repetition of those extracts of sound in varying order, he presented a pleasing "musical" item.

Miss Dorothy Harris has now started "The first Tape Recording Club in Eastbourne." Prospective members can contact her at 12 Victoria Mansions, Terminus Road—telephone: Eastbourne 2771.

The Hon. Secretary of the **Exeter Society for the Blind**—Mrs. T. M. Hayward—would appreciate a volunteer "tapespondent" in either Weymouth or Stockton. Anyone willing to help, please write to Mrs. Hayward at The Social Centre for the Blind, South Street, Exeter.

Mr. W. J. Lloyd, the acting Secretary of the **South Manchester Tape Recording Club**, would like to hear from any South Manchunians who wish to join this recently formed group. Please write to Mr. Lloyd at 13 Edge Lane, Chorlton-cum-Hardy, Manchester, 21.



Mr. van de Werken, author of a recently published Dutch encyclopaedia, interviews some of the animals which illustrate his book. The recordings of their voices, made with the Grundig, were later transferred to disc.

The newly elected Secretary of the **Harrow Tape Recording Club**, Mrs. Toni Fisher, states that meetings are held every Thursday, at 7.30 p.m. in the Labour Hall, Wealdstone, Middlesex. Members, who to date have compared their own "assorted" tape recorders, are most anxious to broaden the circle. If you are interested in joining, please write to Mrs. Fisher, 5 Gloucester Road, North Harrow, Middlesex.

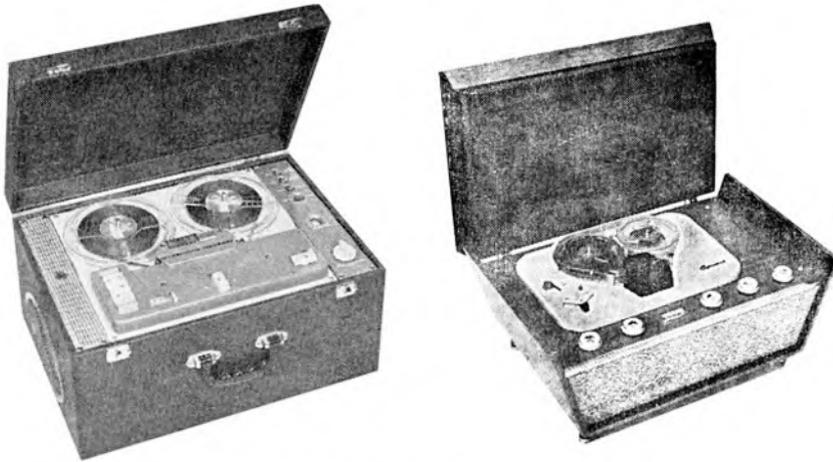
Mr. D. T. Dean wishes to form a Tape Club in **High Wycombe**. So enthusiasts in South Bucks, please contact Mr. Dean at "Brightwell," Wycombe Road, Holmer Green, High Wycombe, Bucks. The indefatigable Mr. Dean is the proud owner of a Sound Belle recorder, and would be more than pleased to tapespond with the owner of a similar machine.

The **Grantham & District Tape Recording Club's** Chairman proposes the formation of a national and/or international stereo recordists club. He suggests that activities could include tape discussions on stereo mixer units; multi-mic. 2 channel stereo; multi-channel stereo; and actual stereo recordings undertaken by members. The proposed name for this club to be World Stereo Recordists Association.

Did You Guess? The photograph on page 170 is of the Standard Telephones and Cables "Machine-Gun" microphone. It is highly directional, and is used together with its spotlight for locating echoes in buildings.

AND STILL THEY COME

— MORE NEW RECORDERS



Symphony Tape Recorder (top left)

THE Symphony general purpose tape recorder uses the Truvox Mark 5 Deck, and the Truvox type K amplifier. The operating speeds are $7\frac{1}{2}$ and $3\frac{3}{4}$ i/s and there is a magic eye level indicator. The signal to noise ratio is at least 45 dB, and wow and flutter is better than 0.2%. In addition to the portable version illustrated this recorder may be obtained in the Record Housing Nordyke Cabinet. Price £56 14s. Manufacturers: Symphony Amplifiers Ltd., 16 Kings College Road, London, N.W.3.

* * *

Simon Minstrelle (top right)

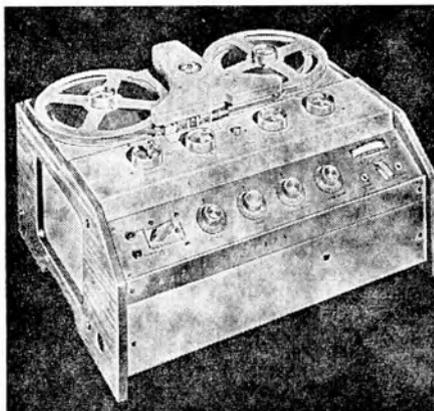
THE Simon Minstrelle breaks away from the conventional general purpose tape recorder styling. Although light enough to be termed a portable—it weighs $27\frac{1}{2}$ lbs.—it is designed primarily as a table model and is housed in an attractive wooden cabinet on 4 squat feet. Other features which may be regarded as unconventional are the built-in microphone (which can, however, be by-passed by the simple operation of plugging in an external microphone), and the use of the Garrard magazine loading deck. This deck has been described previously in *The Tape Recorder*, and operates at the single speed of $3\frac{3}{4}$ i/s. There is a magic eye level indicator, and facilities for mixing and straight-through amplification. The dimensions are $18\frac{1}{2} \times 11\frac{1}{2} \times 8$ ins., and the price is £40 19s. Manufactured by Simon Equipment Ltd., 48 George Street, London, W.1.

* * *

*

**New Multimusic
Tape Deck
Incorporated
in Model A
Recorder**

*



WE gave details recently of the new Multimusic tape deck, and have just received advance information of the first of the Reflectograph recorders to incorporate it. To be known as the Model A, this machine is extremely flexible and simple to operate, while achieving professional performance.

As the photograph shows, detachable wooden sides are fitted in lieu of a cabinet. When the recorder is built into a console or

other furniture, these sides may be removed completely. Alternative enclosures will also be available, and the standard professional width is employed to facilitate rack mounting. Direct drive is taken from a heavy duty synchronous motor, so that instant start and stop are possible.

A metal foil actuated automatic stop is included, and open access to the heads facilitates tape editing. Fast wind in either direction occupies only 45 seconds for 1,200 feet of tape. There are separate record and playback amplifiers (and heads), incorporating bass and treble tone controls, a new type of level meter, and a Tape/Input switch to allow immediate comparison of the incoming and recorded signals. Wow and flutter total less than 0.2 per cent. RMS, and the frequency response is $40-10,000$ c/s ± 2 dB at $7\frac{1}{2}$ i/s and $40-7,500$ c/s ± 2 dB at $3\frac{3}{4}$ i/s. The signal to noise ratio is 50dB (unweighted). Red and green indicator lamps are associated with the record/playback switch, and a safety button protects accidental erasure. The tone controls operate on playback only, and have red spots to indicate the settings for CCIR response (or NARTB on special order). The price, with half track erase, record and playback heads, one way operation, and 3 watt amplifier is £99 5s.

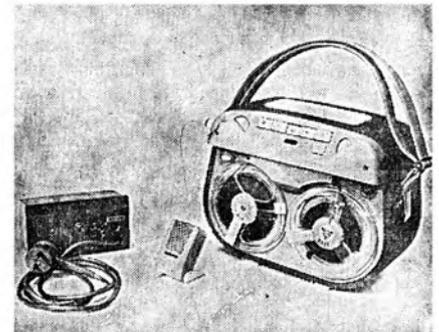
Write for further information to **Multimusic Ltd., Maylands Avenue, Hemel Hempstead, Herts.**

* * *

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**The Butoba
Battery
Portable
(Weight 12lb.)**

*

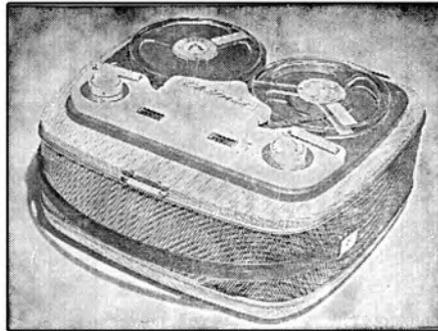


AN interesting newcomer to the ranks of battery-operated portable tape recorders is the Butoba. The operating speeds are $3\frac{3}{4}$ and $1\frac{7}{8}$ i/s, giving a maximum playing time of 2×2 hours on Long Play tape at the slower speed. There is push-button operation of Record/Replay, Fast Forward, Fast Rewind, and Stop; and Tone and Volume controls. Separate input sockets are included for microphone (200 ohms, 200 microvolts) and radio (100 Kilohms). The frequency response is quoted as $50-13,000$ c/s at $3\frac{3}{4}$ i/s, and $60-5,000$ c/s at $1\frac{7}{8}$ i/s. The amplifier delivers 1.2 watts to the built-in loudspeaker, and there is an auxiliary output rated at 100mV for connection to a radio or external amplifier. Four ordinary 1.5 volt flashlight batteries are required for the motor, and a further four for the amplifier. The operating life is 20-40 hours. A convertor is available, so that the recorder

AND STILL THEY COME

- MORE NEW RECORDERS

cont.



Chitnis KM22 Recorder (top left)

may be run from AC mains or a car battery. There are two motors, the outside dimensions are $9\frac{1}{2} \times 12 \times 6$ ins., and the weight is 12 lb. including batteries. The price is £72 9s., plus £7 7s. for the moving coil microphone.

The Butoba is a German importation, and is distributed by **Denham and Morley Ltd., Denmore House, 173/5 Cleveland St., London, W.1.**, who will gladly supply more information.

TWO versions of a tape recorder which is entirely new to this country are announced by **Chitnis Electronics, 1 Long Acre, London, W.C.2.** The German deck runs at $3\frac{3}{4}$ and $1\frac{1}{2}$ i/s and accommodates $5\frac{3}{4}$ in. spools. There is a magic eye level indicator and an outlet from the pre-amplifier stage. The Chitnis KM22 is a standard 2 track model, price, with dynamic microphone, £56 14s. The KM33 is a 4-track version and costs £65 2s. Stereo recorders are also promised. Write to the above address for further details.



*
**P.a.R.
Electronics
Announce
The New
Allegro
Recorder**

Elizabethan Major (top right)

THE Elizabethan recorders have earned a considerable reputation through such models as the Essex, Avon, and Princess. Just announced is the new Elizabethan Major, which incorporates a number of features more usually associated with semi-professional machines. A new style meter is employed for level indication and the extra large amplifier produces 6 watts push-pull output. There are two built-in loudspeakers, a 10×6 in. main unit and a tweeter. The frequency response extends to 20,000 c/s at $7\frac{1}{2}$ i/s. The deck is the Collaro Studio. Overall dimensions are $15\frac{1}{2} \times 16\frac{3}{4} \times 9$ ins. Weight 32 lbs. Price, with tape, £68 5s. Write for details to: **Messrs. E.A.P. (Tape Recorders) Ltd., Bridge Close, Oldchurch Road, Romford, Essex.**

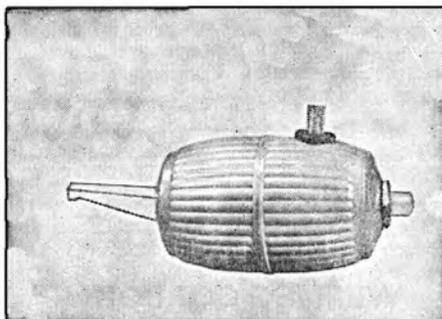
THE Allegro is another new recorder which employs the Collaro Studio Deck. It provides a surprisingly versatile set of facilities at an economical price. These include separate bass and treble controls, superimposing, automatic muting, pause, and magic eye level indicator. The amplifier produces 3 watts and the loudspeaker is a 9×5 in. elliptical unit. The dimensions are $15 \times 15\frac{1}{2} \times 9$ in., and the weight is 24 lbs. Price, complete with crystal microphone and tape, £40 19s., from **P.a.R. Electronics, 7 Avery Row, Mayfair, London, W.1.**

*
**For The
Protection of
Portable
Recorders
A New Line
in Waterproof
Covers**



A RANGE of Protective Covers for portable tape recorders is soon to be available, of which the photograph is an example. These covers are water-proof and have a wrap-round zip fastening. The base is reinforced, and the microphone pocket has its own zip fastener and name panel. The price for the large cover necessary for a Grundig TK60 is £3 17s., and the prices are scaled down according to size so that, for example, the Fi-Cord cover is priced at 19s. 6d. The manufacturers are: **A. Brown & Sons Ltd., 24-28 George Street, Hull, Yorkshire.**

*
**The
Cinesmith
Depolarizer**



THE advantages of using a depolarizer for the periodic demagnetisation of recording/play back tape heads have several times been discussed in this magazine. The Cinesmith Depolarizer is designed for the purpose, and will effectively reduce noise and other troubles associated with magnetisation of heads. It is guaranteed for 12 months, has an extended pole-piece at one end and a push button on/off switch at the other. The retail price is £1 15s. Enquiries to **Cinesmith Products, Regent Street, Barnsley, Yorks.**

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FREQUENCY RANGE 60-16,000 cps at 3½ ips and
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Press button controls. Extra-sensitive braking and tape tension control system. Recording head with ultra-fine gap. Indirect fly-wheel drive. Fast rewind, quick stop button. Digital counter. Automatic tape-end stop. Connections for earphones, remote stop/start control and extension speaker. In attractive lightweight Styron Case.

52 gns (excl. microphone)

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FOUR TRACKS provide a playing time of 12 hrs. 40 mins. from one 5½" DP tape. Two speeds with frequency response of 30-16,000 cps at 3½ ips and 30-9,000 cps at 1½ ips. D.C. heating of valves. Transistorised pre-amplifier stage. Four tracks facilitate perfect superimposition. One track may be monitored through earphones while the other track is being recorded. Simultaneous playback of both tracks together or either track separately.



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TDR

Readers' Problems

Unwanted Superimposition

Dear Sir: In a brief reply to editorial comment on the letter by the lady from Malvern (in the Feb. issue) I would like to mention that I too have experienced the rather odd happening (at first-sight) of superimposition on a second machine.

A friend of mine in London sent me a reply on a 3 in. spool I had first used this same spool, the result was that my recording was audible on my machine. We overcome this amazing situation by using a 5 in. spool and each using one track exclusively. This has been the arrangement for about twelve months now and has given trouble-free recordings ever since.

No doubt you will receive many letters on this subject but perhaps my suggestion that Miss H. J. M. F. uses the above idea will be of some help.

Yours faithfully, J. K. Smith, 3 Kelso Road, Fairfield, Liverpool 6.

Tapes and the Customs

Dear Sir:—The idea of "exchanging languages" by means of tape recordings interests me, but can you please tell me if one is likely to run into any difficulties with, say, the French and German customs on the outward transmission by post and by the English customs when tapes arrive from abroad. What is the smallest tape spool that one can purchase?

Yours faithfully, H.W.G., Parracombe.

Corresponding by means of tape does not usually involve any Customs complication, certainly if you are proposing only to exchange small "message" spools—these are 3 inches in diameter, and the smallest available. There are a number of interesting points in connection with Customs, however, which we think worth mentioning. Tapes bought abroad must be declared on passing through Customs, and will be liable to import duty on entering this country. The rate is 10 per cent. of their purchase price, and it will help to present an invoice or shop receipt to show the cost at the time of buying.

Another point concerns taking a tape recorder and accessories abroad. In this case it pays to take along with you a prepared statement of the origin and type of recorder, etc., details of your journey, number of tapes, etc. This is a particularly useful precaution if you happen to possess a recorder of foreign origin—Grundig, Stuzzi, Telefunken, etc.—and may simplify your passage through Customs in both directions. To return to your original question on sending tapes by post, perhaps readers would like to weigh in with advice from their own experience.

Matching Decks and Amplifiers

Dear Sir:—I was very interested to read in the January issue of W. T. B. of Slough's problem, and your reply. If you would allow me I should like to relate my experiences.

In the late summer of 1957 I purchased from a well-known firm in London a completely assembled and tested tape recorder comprising a Truvox Mark IV deck and a Mullard Type A amplifier. Previous to the purchase I had bought the firm's "Home Constructors Manual" for the amplifier, and had also obtained a copy of Mullard's Book "Circuits for Tape Recorders" so that if necessary I could service the amplifier. The firm in question are most emphatic in their advertisement that you must state with which deck you wish to use the amplifier. This is because of the complexity of high or low impedance record/replay heads used together with high or low impedance erase heads, and both heads have to be correctly matched to the

output of the oscillator valve to obtain the correct recording bias voltage on the record head with the consequent minimum of distortion.

I am working on the assumption that W. T. B. has the correct amplifier for the Collaro Deck and that, like myself, he has a Type A amplifier. Like W. T. B. I seemed to suffer from loss of high frequencies and again like him I have obtained most useful tips from reading *The Tape Recorder* and *Hi-Fi News*, including the high frequency boost circuit on playback that he had described. I tried altering the "peaking" point of the high frequency pre-emphasis network in the recording circuit because, quite frankly, I was trying to get a higher response at the lower ($3\frac{1}{2}$ i/s) speed, but results were worse instead of better.

Eventually I discovered my mistake. I was always recording with the magic eye level indicator just not closed, and was consequently over-modulating the tape and getting self demagnetisation of the higher frequencies. Let me explain this further. Messrs. Mullard in my copy of their book quote, under the heading "Recording Sensitivity", a recording current of 200 micro-amps at 1 Kc/s. My Truvox record/replay head requires a recording current of 100 micro-amps approximately.

Messrs. Mullard also state that the magic eye just closes when a signal of 20 Volts RMS appears at the anode of the recording output valve to drive the (presumed 200 micro-amps) recording current through the bias rejection circuit and the record head. I have always preferred to record with the magic eye just not closed, so as to get a sensibly constant tape modulation for a variety of recordings and so avoid constant alteration of the volume control on playback. After experimenting I found that a high stability 200K resistor inserted at the point where the bias rejection filter "meets" the grid circuit of the EL84 valve did the trick. It helped to swamp the effect of the impedance of the record head at differing frequencies, it drastically reduced my recording current and up went the high frequency response. I have pushed the high frequency response up a little higher on occasions by recording at $3\frac{1}{2}$ i/s with the equaliser switch in the $7\frac{1}{2}$ i/s position, like you suggest in your reply, and then playback with the equaliser switch in the $3\frac{1}{2}$ i/s position.

I have no details of the recommended recording current for the Collaro Mark III deck but it has high impedance record heads as has my Truvox.

Another factor which has to be taken into account is the Azimuth adjustment of the record head. To test for alignment you require a test tape and an oscilloscope. Failing the possession of these, seek the aid of your hi-fi dealer.

Yours faithfully, C. C. (Plymouth).

Thank you for your interesting reply. There are very few problems in matching a deck to an amplifier which cannot be resolved by patient trial and experiment. Nevertheless, as your letter confirms, there are enough variable quantities to deter anyone who lacks the necessary technical knowledge. In such cases, a complete recorder is the best buy.

Making the Parabolic Reflector

Dear Sirs:—Congratulations on publishing a first-class magazine. The article on designing and using a reflector is something which I have waited for since No. 1 issue. However, getting the parabolic reflector made is easier said than done. I have spent hours writing, calling, phoning, and not one firm can, or will do the job for me. Can you please inform me of any firm who will produce a 20-inch parabolic reflector for a reasonable figure? With anticipatory thanks,

Yours faithfully, R.V.A., Chesham.

We do not know of anyone prepared to supply the 20-inch reflector as described in E. D. H. Johnson's series of articles, but no doubt this letter will produce offers of help. Romagna Reproducers Ltd. have intimated to us that they could produce the reflector section ready for fitting of the damping material and accessories, but the price could be kept to a competitive figure only if a reasonably large run was shown to be required.

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building and using a reflector

PART 3 INCREASING YOUR MOBILITY

By E. D. H. JOHNSON



Showing the author (right) using the parabolic reflector to record bird songs on a recent expedition in Spain (photo Eric Hosking).

UNLESS you are very fortunately situated, with a large garden in which many types of bird habitat are represented, the limitations imposed by the mains cable will soon be felt. With the extra scope provided by the parabolic reflector, the songs and calls of the more familiar garden birds will soon be recorded and you will feel the necessity to venture farther afield. In Britain today one is seldom far from electricity mains, except in the remotest areas, and it is surprising how many species of birds can be reached simply with the aid of a few hundred yards of rubber-covered cable of comparatively modest capacity.

The average recorder places a load of little more than a hundred and fifty watts on the mains, at the very maximum, and there is no appreciable drop in voltage over distances of three to four hundred yards. If there is a drop, and it can be ascertained by using a voltmeter at the recorder mains input, whilst it is running, compensation can be made by setting the mains transformer tapping to a lower figure. If this is done one must, of course, remember to revert to the normal voltage setting when using a short cable.

Continuous earth needed

When using long mains leads in the field, great care must be taken to ensure that all connections are good and that insulation is sound. The polarity must be correct at the recorder, and the switching must be in the "live" side, with the earth connection continuous throughout the cable. As an additional safety precaution an earth pin should be connected to a suitable part of the recorder chassis. Particular care must be taken when using the equipment in damp or dewy conditions, and all joints in the mains cable should be protected from the intrusion of moisture. For obvious reasons the recorder itself should be kept under cover whenever possible.

Extension cable is best kept on wooden drums in units of fifty yards, with flat three-pin connectors, and if considerable lengths of it are likely to be used often it is as well to have some means of winding it rapidly on to the drums by hand. Before going to the expense of obtaining great lengths of cable, however, it is advisable to give serious consideration to the question of running the recorder from a car battery, via a suitable vibrator unit, with which I shall be dealing shortly.

No matter how one's power is obtained or how mobile the equipment, extra microphone cable is an essential at a very early stage in one's career as a bird recordist. If, as I have earlier suggested, you have equipped yourself at the outset with a low impedance microphone and, if necessary for your recorder, a suitable matching transformer, it is comparatively simple to add extra cable of the right type. But here

a little care is needed if some of the pitfalls are to be avoided. Always it must be borne in mind that you are dealing with quiet, often distant, low energy sounds which are usually of high frequency. This may necessitate high settings of the gain control of the recorder and any unwanted noise will, under these conditions, become alarmingly obvious. It is therefore imperative that extraneous noise should be kept to an absolute minimum.

With microphone extension cables of the wrong type it is often possible to pick up the most exasperating noises, from common mains hum to the Third Programme. The system I now use has proved itself beyond reproach in all circumstances, but there will, of course, be experts who will tell you that all you need is a large roll of twisted flex and some insulating tape. It may work in your case; it certainly did not in mine!

My microphone cable is of the twin-feeder type, with two insulated conductors and an outer copper braid. Being plastic covered, and of fairly small diameter, it is easily housed in a length of one hundred yards on one of the drums sold for power tool extension cables. This drum has a convenient handle for rapid rewinding, and a recess in one of the flanges takes the connector at the attached end. The most suitable connectors are the three-pin Continental type and great care must be taken to ensure that the soldered joints are well made and that the earth connection to the braid of the cable is continuous throughout its entire length, through all connectors, from the microphone to the input socket.

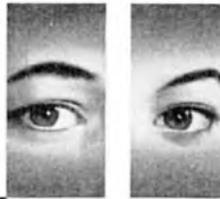
Cable drums

About two hundred yards is a convenient maximum length of microphone cable, although this can be extended in ideal conditions. It is best arranged on two drums, one with an unbroken hundred yards and the other with two fifty-yard lengths. The connectors should be arranged so that the drum remains near the recorder as the cable is pulled out to the microphone position. The twenty-foot cable described last month, containing the matching unit, is then plugged into the socket on the drum. It is essential to ensure that the braid is connected to earth as near to the recorder as possible, and at no other place. The most convenient place for this connection will probably be at the input to the matching transformer, since the output is likely to take the form of a co-axial cable.

The earth-pin, mentioned earlier as a safety precaution, now assumes a new importance in ensuring that the background noise is kept to a minimum. The soil surrounding it should be thoroughly damped with salt water to increase its conductivity.

The use of long microphone leads does tend to introduce the disadvantage that it is difficult to control the recorder from the

All eyes on the



Garrard

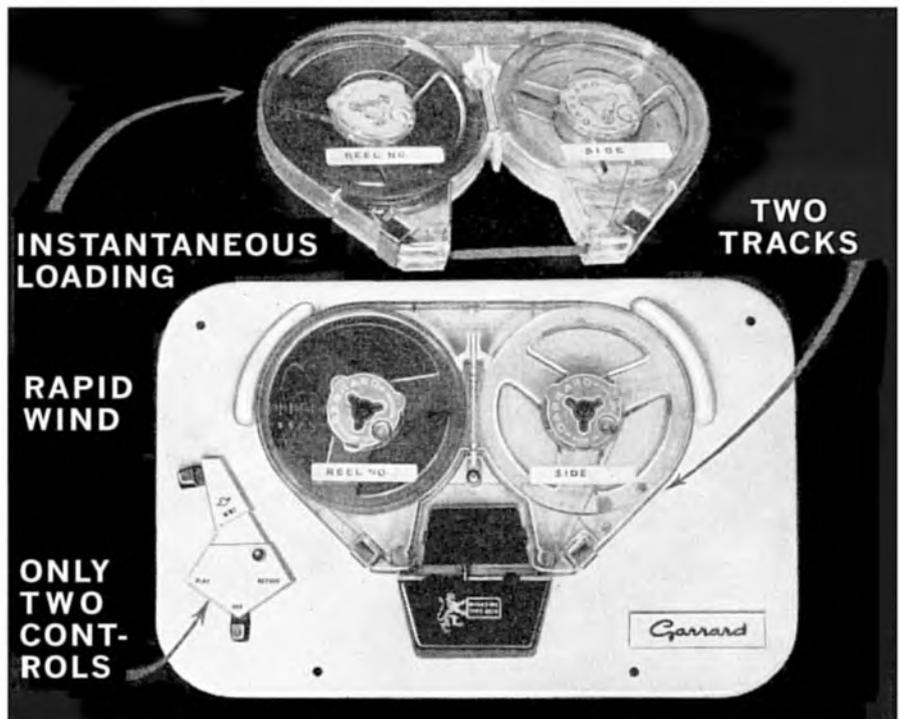
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parabola without an assistant. In practice, however, it is surprising how much of your work will be carried out at about the same setting of the volume control, and it can safely be left to take care of itself whilst you direct the reflector. Also, it must be remembered that the parabolic reflector is not the answer to all bird recording problems and there will be many occasions when the microphone will have to be placed close to a nesting bird at a time when it is of the utmost importance that the operator and his equipment shall be as far away as possible.

Ultimately, of course, one must achieve the maximum of mobility, if not complete portability. Until such time as a battery portable machine of sufficiently high performance is introduced at a price below a hundred pounds, the best possible compromise for the amateur is to run a good mains machine from a converter unit in a car. The most convenient source of supply is a vibrator converter delivering 200/250 volts A.C. from a 12-volt car battery.

The vibrator

Such a vibrator usually consists of a small metal box, approximately $9 \times 7 \times 6$ inches housing the components, and having external sockets for input and output and an on-off switch with terminals for remote control. For its size it is rather heavy, so I soon fitted mine with a leather attache-case handle, which I bolted to the top of the casing with self-tapping screws. The input lead should be as short and as heavy as possible, so I limited its length to six feet and soldered two large crocodile clips to the ends for connecting to the terminals of the car battery. In practice, I found later that its length could be extended considerably, but the performance may become unstable if an excessive amount of cable is used. For the output cable I used twelve feet of cab-tyre flex with a suitable connector for attaching it to the existing lead of the recorder.

When recording, I laid the vibrator on the ground beside the bonnet of the car, connected the clips to the battery and ran the output cable to the boot where the recorder was placed. Another twelve feet of thin plastic covered flex with a drop-switch on the end was connected to the remote control terminals of the vibrator so that it could be switched on and off from the recorder position. The aforementioned earth-pin and a bottle of salt water complete the equipment, and they are even more important when working with a vibrator.

Under the floor

This arrangement is suggested as being satisfactory for your initial experiments. It keeps the battery leads short and the vibrator away from the recorder, where it might cause hum if placed too close. The layout of your own car will probably suggest other and more convenient arrangements. My vibrator is now permanently housed in a fully enclosed recess which I found under the floor of my station-wagon. It is ventilated and protected from shock by a wrapping of foam rubber. I have run heavy cables through fuses to the battery terminals, and the output and remote switch leads are taken under the floor to two 2-amp 3-pin sockets in a convenient corner near the back door. The socket for the remote control is switched and a 2-amp 3-pin plugtop is shorted internally in such a way that the vibrator cannot be switched on unless it is inserted. This gives additional safety, and also ensures that it is not tampered with by unauthorised persons. In running the cables and wires below the floor or chassis of the car great care must be taken to guard against chafing which might cause dangerous short circuiting. If in any doubt at all as to your ability to do this properly, have it done by a qualified automobile electrician.

With this equipment one can travel with everything ready for instant action, after the earth pin has been put down. A few further refinements can be added to suit individual requirements; the reflector could be mounted, when travelling, on a ball-and-socket joint attached to the roof-rack, and an extra battery could be carried, fitted with suitable handles, for those occasions when you have to get to places which are inaccessible to the car and out of reach of your extension cables and parabolic reflector. Next month I shall begin a series of accounts of experiences in the field with the equipment I have been describing.

LETTER FROM NEW YORK

THIS month I would like to concentrate upon some of the smaller news items from Trade and Consumer periodicals. To give you a full picture of all that is happening over here is most difficult in the space of a single column, and I hope that maybe you will be able to put the pieces together to form your own outline if I do this every so often. So I will start in with one or two quotes from *Audio Times*, which is always on the ball when it comes to news.

This from "Electricraft," one of Seattle's largest component dealers: "It's tape all the way, from here on out, and four-track tapes are replacing two-track tapes in this firm's stock. Business is up 20 per cent. over last year and the future looks good. We have discontinued buying two-track tapes except for a handful of exceptionally outstanding ones. By this I mean not over 20 in a total library of 1,000 two-track tapes are outstanding enough to keep on order with four-track on the market."

I see from your recent *Hi-Fi News* that you give space to Hi-Fi Furniture and mention "Packaged Hi-Fi" as sold in America. So how about this, still quoting from *Audio Times*: "Furniture is becoming more and more of an important factor in sales. Even though components may be built-in, the customer wants to pick out speaker cabinets to match his existing furniture. We carry many different kinds of woods and finishes in a large selection of styles, and are constantly building our stock. Complete systems sold at Electricraft range from \$300 to \$2,600 or more. (About £105 to £910.—Ed.). For pre-recorded tapes the firm uses Bell tape decks that play into booths, so that the customer can hear a tape before selecting it. For future expansion headphones are being considered so that more people can listen at the same time. We have sold more stereo tapes every year of our existence, and tape is still our first love. We believe that in the long run, the durability and higher quality of tape will prevail. We will continue to expand our stereo tape library, as we believe the future is there."

From what you tell me, you have still to see the two-track tape market established in England. From what I have seen here that should be good business when it gets going. As you know, Ampex and Orr Industries recently merged. John Leslie, manager of Orr and a vice-president of Ampex, estimated 1949 business for magnetic tape industry sales at \$40 millions, and predicted \$100 millions by 1963. He said that magnetic tape sales had been increasing at "a dramatic rate" for the past few years.

Back to your "Hi-Fi Furniture Supplement" for a moment. To show you how important this rates over here, firms are marketing cabinets in kit form to cover almost all ideas that individual customers can think up. "Artizans of New England" are advertising "Knock-Down-Flat" kits with patented connector joints which enable constructors to build up audio cabinets with professional miter-joints. The choice of woods includes fine veneers of teak, walnut, koa, etc. It's an idea, believe me!

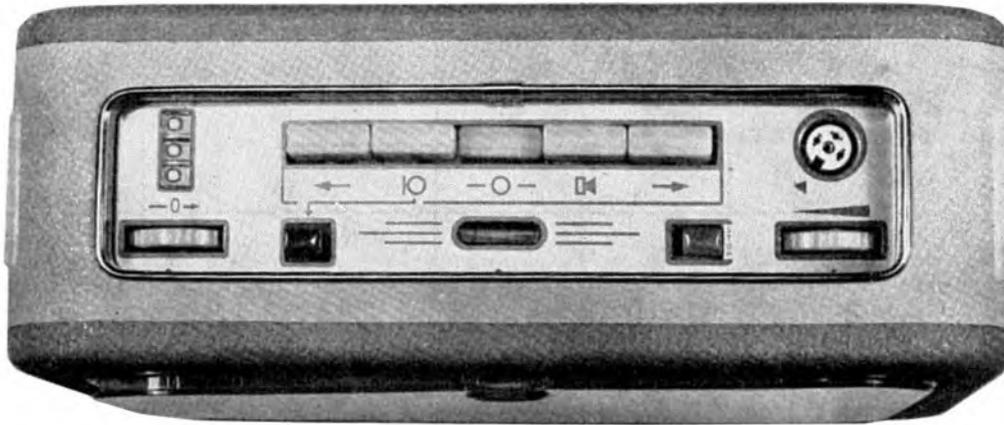
Finally, as my space seems to be running out, here are a few words from Herman "Hy" Post, President of Robins Industries Corp, which may answer a few unspoken fears on your side of the ocean, too! "When one really gets down to the roots, less and less reason exists for delaying the purchase of a tape recorder. Present machines and tape are of such quality as to return more lasting fun and pleasure than could be obtained from many other entertainment activities, even at double the price. Tape recorders in their present form are destined to be with us for many, many more years. True, speeds have varied . . . but all the indications are that $\frac{3}{4}$ -inch tape at $3\frac{3}{4}$ and $7\frac{1}{2}$ inches-per-second will always be with us . . ." *Yours sincerely,*

"Just got back from the
1960 Audio Fair."



FIELD TRIALS OF BATTERY PORTABLES

No. 6 THE STUZZI-MAGNETTE



* Close up to show the controls. The top row of 5 push buttons and the two lower buttons are operated as itemised on the Table on the opposite page. Other facilities are the 3-digit position indicator (left), the level indicator (centre), and the volume control (right).

A GLANCE at the Technical Specification of the Stuzzi-Magnette indicates that this is a battery-operated machine which sets out to rival the performance of many mains recorders. The present Field Trial was accordingly made a few degrees more stringent than usual, since it was realised that potential Magnette users are looking for something above the average—after all, battery and mains tape recorders are available for less than half the price.

The reviewer's household had just welcomed an *au pair* visitor from Germany when the Stuzzi was received, and the recorder was seized upon as a useful way to practice the mutual learning of languages. To begin with, solo readings were recorded, both in English and German, to be commented on at length when played back. The critic in each case controlled the playback and, by using the pause button, could interject comment and correct mistakes as the reading progressed. It might be argued that a mains recorder could have been equally useful here, but the ease with which the Magnette was passed from person to person (and even carried off to bed by our visitor) justified the use of a battery portable.

Readers should be warned, however, that this recorder is not capable of being completely mastered by a novice in one easy lesson. Push-

button controls are employed throughout, and for practically every operation it is necessary to push more than one button. For example, it has been arranged that pressing the centre *Off* button automatically engages the *Pause* control (i.e., moves the *Pause* button to the "hold" position). Therefore, operating the *Record* or *Playback* button causes the motor to run all right, but the tape remains stationary until until the *Pause* button is slid sideways.

Controls Fairly Complex

In the case of *Recording*, there is the usual safety catch, so that altogether three controls must be operated. For fast *Rewind* or *Wind Back*, the appropriately arrowed button is depressed, plus the *Off* button. The exact timing and pressure to be applied also takes a bit of getting used to, and while this will not worry most people after practice, it certainly makes one's first attempts a bit hit or miss. As a family *aide memoire* I compiled the table of operations shown, and this was generally found to iron out all doubts.

Most of our early recordings were made at too high or too low a level. Two factors contributed to this; firstly, our lack of familiarity with the Exclamation Mark type of level indicator, and secondly, the edge-type volume control which looks the same at whatever setting it is adjusted to. Admittedly, the latter fault is common to the majority of volume controls, but even a dot on the periphery of a knob would be better than nothing. As it is, one has to wind the control fully off and then rotate it through an arc which memory suggests will correspond to about the right volume for the particular type of recording—or carry out a trial recording by reference to the magic eye. As I have suggested, we found that our interpretations of the latter's readings were not very successful at first. Within the family circle we relied on a pencil mark on the volume control, to be placed central for speech through the microphone, and at about $\frac{1}{3}$ for recording/playback through the hi-fi equipment.

On the question of actual quality of recordings on the tape, the Magnette was found to be highly acceptable. As a special treat to the English/German learners, their voices (usually played back through the Magnette's small built-in speaker) were relayed through the full hi-fi set-up. In fact, two speakers were employed (as for stereo) and the voices, apparently coming from a point mid-way between the loudspeakers, were very life-like indeed. Still greater realism was obtained using an expensive low impedance microphone, and the slight mismatching (30 ohms to 200 ohms) appeared not to matter.

The German visitor's attendance at a nearby riding stables gave scope for testing the Magnette's mobility, and produced a number of



Showing the speed change button (left) and battery compartments.

FIELD TRIALS OF BATTERY PORTABLES cont.

No. 6 THE STUZZI-MAGNETTE

interesting recordings. Simply walking amongst the horses and riders, with the recorder slung from one's shoulder in its ever-ready carrying case, it was possible to obtain an excellent overall picture of activity. I then stood by the gate as the file of horses passed from soil to tarmac surfaces, and the effect on the recording was quite marked. (Except for a few ricochets and revolver shots, we now have all the necessary sound effects for making our own recorded Western!)

Remembering some television shots in which Pat Smythe gave a running (or jumping?) commentary as she took a horse over a series of jumps, we tried strapping the Magnette on to a rider, with the microphone threaded up through his sleeve and clipped on to his chest. But the bumps and rushing noises as the microphone and its cable rubbed against clothing—not to mention the jogging of the recorder itself—produced a recording which might have been anything from an earthquake to a boxing match! Of course, the B.B.C. use a radio microphone with a tiny transistor transmitter which is picked up by a receiver attached to the sound equipment, and the actual microphone casing is of the noiseless material specially developed for cutting down clothing noises on hearing aids.

Table of Push-Button Operations

Function	X X X X X X X X X X	Remarks
Off	. . X	
Playback	. . . X	Slide pause button to left
Record	. X . . . X . . . X	Move green button forward. Slide pause button to left
Straight-through Amp. X	Watch for feedback
Fast Rewind	X . X	Arrow button, then Off
Fast Wind On	. . X . X	Arrow button, then Off

All the above recordings were carried out at the higher speed of $3\frac{3}{4}$ i/s, which gave more than 20 minutes playing time per track on the 4-inch spool of long play tape.

Changing to the $1\frac{1}{2}$ i/s speed involves manipulating a knob on the motor casing itself, accessible by unfastening the back flap of the recorder, and needs a little practice before it can be performed smoothly. You can just about see which speed has been selected, without taking off the back, by looking through the covering grille.

Threading of the tape, and changing spools are easily accomplished. A very good feature is the fitting of plastic nuts on the spool spindles.



A visitor to London is interviewed using the Stuzzi-Magnette.

This keeps the reels safely in position however the recorder is tilted, and makes a vertical position most convenient. The grouping of all controls on one end also suggests that the machine should normally be used upright.

Standard flat 4.5 volt torch batteries are fitted into plastic compartments at the rear—two each for amplifier and motor supplies. The housing itself does not give a great impression of robustness, but was found to be perfectly satisfactory in service. A minimum operating life of 30 hours is specified, but this is based on continuous recording and will usually be just about doubled in practice. There is an effective battery "state-of-charge" indicator, which consists of a small Maltese cross electromagnetically turned to mask white or black whenever the capstan motor is running satisfactorily.

To sum up, the Stuzzi-Magnette is eminently portable, but no facilities have been omitted or skimped in order to produce a vest-pocket job. The size and weight are accordingly greater than any encountered in these Field Trials so far, but 8 lb. is not excessive for most purposes. In any case, this model will make a special appeal to the "one-machine" man, whereas some battery recorders are more appropriate to a user who also has a mains machine.

Technical Specification

Battery Complement: 4 × 4.5 v. torchlight batteries. **Battery Life:** 30-100 hours. **Two Motors.** **Transistors:** OC 360, 3 × OC 304, 2 × OC 308, OC 30. **Diodes:** OA 70, OA 85. **Magic Eye:** DM 71. **Tape Speeds:** $3\frac{3}{4}$ and $1\frac{1}{2}$ i/s. **Frequency Response:** 80-9,000 c/s at $3\frac{3}{4}$ i/s, 80-4,000 c/s at $1\frac{1}{2}$ i/s. **Recording Sense:** Top track, left to right. **Inputs:** Microphone 200 ohms, telephone adaptor or radio by extra lead provided. **Output:** Feed for headphones or external amplifier 400 mW. **Maximum Spool Size:** 4-in. **Fast Forward and Rewind:** Approximately 2 minutes for 450 ft. long play tape. **Position Indicator:** Three-digit type. **Straight-through Amplification Price,** with moving coil microphone, tape, carrying handle and transcription cord: £

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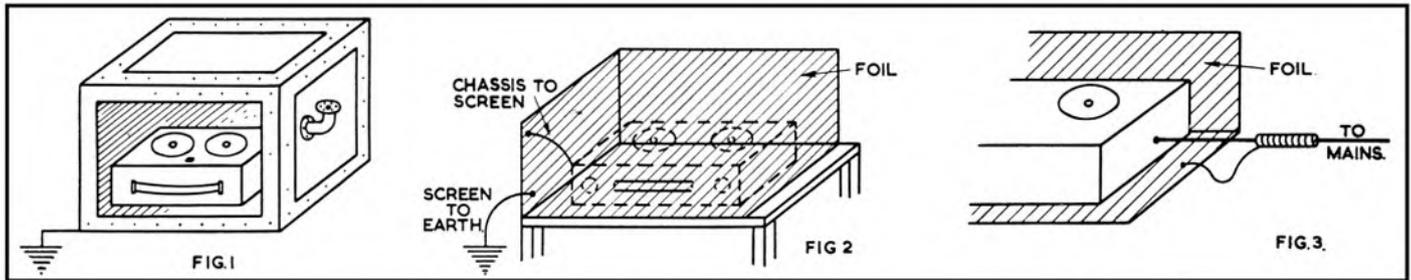
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Curing TV interference



TO the amateur tape enthusiast, RF "off the leash" can be a veritable nightmare. I know. Mine lasted six weeks. It all began one Saturday when I transferred myself and my possessions from a N.W.6 basement to a S.W.17 attic. Being in dire need of rest and relaxation after this exhausting work, I lit my pipe, opened a bottle of beer and plugged in my Regentone recorder. And that's when the trouble started, for, as the recorder warmed up, I found to my astonishment that I was radiating the Television Service of the B.B.C.

Thinking the machine had been damaged in transit, I unscrewed the deck and feverishly explored the dark, mysterious interior. But everything appeared to be in order; all wires "going somewhere"; the valves and other sundries firmly in their respective mountings. Resetting the deck in its case I tried again—with the same result.

Next, seeking to clarify the situation in my mind, I made a few simple, rather uninspired, tests and drew up a brief summary of what seemed to be the important factors.

(1) Recorder picking up TV signals . . . presumably from a nearby transmitter; (2) Signal divided into two parts: (a) Voice or music, and (b) a loud "buzz," the pitch of which varies according to the brightness of the picture being transmitted; (3) Signal is affected by gain and tone controls and is at maximum strength with the recorder in the "replay" position.

Perhaps I should explain that I am in no way an authority on RF or electronics in general. Twelve months ago I came within the very lowest bracket of the "Average Domestic User" category, and even now, although I do know the difference between "i/s," "c/s," and "dBs," I wouldn't know a "mfd" or a "pfd" if I saw one. It was not surprising, therefore, that my unaided efforts to lay this "ghost" were unsuccessful.

I soon discovered that covering the input sockets with an earthed aluminium plate had no effect, and that earthing the recorder chassis only strengthened the "buzz" part of the signal. It was time to seek advice, and of this there was no lack. It ranged from the sublime . . . "Why not sue the B.B.C., Old Chap?" . . . to the (for me) technically impossible . . . "Try detuning the oscillator, Old Boy." One genius suggested 100 per cent. shielding, to be attained by keeping the recorder in an empty water cistern (Fig. 1), whilst another idea entailed wiring a couple of capacitors in the mains supply lead. This last I tried but without success.

The next experiment consisted of semi-shielding, accomplished by lining the table and the walls of the corner in which the recorder stood, with aluminium foil . . . the sort sold for domestic and culinary purposes at a few shillings per roll. I found that by connecting the chassis to the foil and the foil to earth (Fig. 2), the intruding signal was reduced by perhaps 50%.

It was a suggestion that the mains supply lead should be shielded that led to the final solution.

As shown in Fig. 3, the screen mentioned above is utilised but is not now connected to earth. A 12 inch cardboard tube is covered with aluminium foil, and slides along the mains lead. The tube is connected to the screen by 12 inches or so of single flex, and its actual position along the mains lead varies slightly according to time of day and prevailing weather conditions.

It would seem that this set-up gives capacitance; the two capacitor "plates" being the tube and the mains lead. The wire connection is effectively a small inductor; the two . . . tube and connection . . . acting as a series resonant tuned circuit which, when "tuned," short circuits the HF signal from the mains lead to the screen.

It will be found that the same treatment must be given to PU or radio input leads—for some reason I am not troubled by the microphone lead—and to the L/S extension lead. In the latter case, there is no danger of affecting the audio output, as the TV signal is contained in a band of frequencies at approximately 45 Mc/s (45,000,000 c/s), and with the wanted frequencies spread between, say, 20 c/s and 10,000 c/s, effective ratio is at least 45,000 to 1; an ample margin.

Thus, after much fumin' and cussin', head-scratching and nail-biting, the sun shines again. And it could have been worse. As a friend said . . . "Y'know it *might* have been the commercials".

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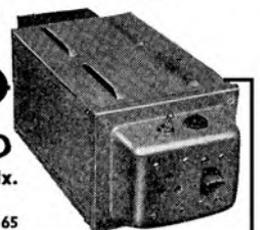
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Practical suggestions for the tape handyman _____ by A. Bartlett Still

No. 12. CURING WOW AND FLUTTER

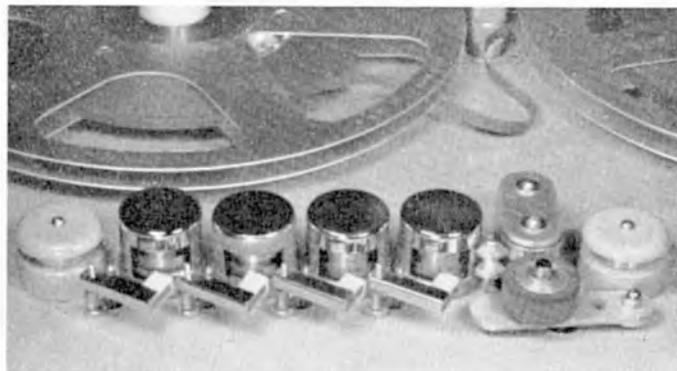
LAST month I tried to give some idea of what this business of "wow and flutter" is all about, and I pointed out that it all boils down to inconsistent speed of the tape past the Record/Playback head. I did then refer to the playback only, and of a perfect recording; but my readers will doubtless have realised that if a recording is made under these conditions, and then replayed, the position is further complicated. If the inconsistencies were to match exactly, the replay would be perfect, if they ended up in exact opposition, the result would be twice as bad! Somewhere between the two lies the normal result.

It is very difficult to find out just how good or bad your machine is by playing normal programme material. A sustained single frequency note is far better. Those who like to invest in a frequency tape, such as the E.M.I. TBT1, will find a whole range of frequencies well recorded. But a lot can be discovered by recording the BBC 1 Kc/s tuning signal, which is radiated for several minutes before the start of programmes. Try a recording at each of the speeds your machine may have, since each speed is equally important from this point of view. You would also be well advised to ensure that you record at a level some little way below full modulation, we don't want the issue clouded by undue distortion.

Listen critically

Replay the tape, at not too loud a level, in a quiet room, and listen carefully and critically. If you cannot detect any warble or change of pitch, replay the slowest recording at the fastest speed and listen again. If you are still satisfied, you can chalk up your machine as inside about 0.25%, and you need read no further.

Should you feel, however, that your machine does not pass this



"... bring a pencil up to the capstan while it is running."

test, and you would like to find out why, you will have to follow certain principles of diagnosis.

The movement of the tape past the heads is initiated and controlled by a number of rotating parts—motors, capstan, pinch roller, spools, etc. By and large, it can be said that eccentricity of quite a small order on *any* of these moving parts will cause trouble. Perhaps a simple example will help. Let us consider a machine having a tape capstan $\frac{1}{2}$ in. in diameter. At a tape speed of $7\frac{1}{2}$ i/s the capstan will turn at about 9.5 times a second. If the capstan were knocked $\frac{1}{1000}$ of an inch out of truth it would introduce flutter at a rate of 9.5 c/s with an amplitude of nearly 1.6% peak to peak! While it is unlikely that you could see 1 thou. of eccentricity, the secret of our diagnosis lies in the figure of 9.5 c/s. If you can relate the frequency of any wow or flutter signal, to the rate of revolution of any part of the machine, *nine times out of ten that part is the cause of the trouble.*

I said that you could not see the eccentricity of the capstan in the example above. If you bring the sharp point of a pencil up to it while it is running, holding it steadily and coming forward slowly until it just touches, eccentricity of a very small degree will show up by the pencil mark being on one side only. Your hand may not be all that steady, so do it several times to see if you always get the pencil mark on the same side. Assuming that dirt is not the cause of trouble, you will have to consult the makers about any metal part found to be eccentric, with a view to replacement.

Should the Pressure Roller seem to be the faulty item, see that it is clean; and if need be clean off any tape oxide with detergent before taking more drastic action.

Warped spools

Two quite common causes of excessive wow can be mentioned. Warped tape spools—so that the flange bears upon the unreeling tape during each revolution—can cause the loading on the capstan assembly to vary, with consequent tape slip. The remedy here is obvious. The second concerns the pressure roller again. If the pressure applied is not sufficient to grip the tape fully, slip will occur. Increasing the pressure slightly with the fingers will show whether a more permanent adjustment of this nature should be made.

Machines have been known to the writer wherein excessive head wear causes flutter. It is difficult to see the reason for this, and only by replacing the heads can one be sure of it as a cause, but it can be borne in mind.

One final word that will doubtless get me into trouble! The average tape recorder dealer has graduated from radio and T.V. His knowledge of things mechanical is not great (after all, it has never needed to be!), and I do, therefore, believe that trouble such as we have been discussing is best referred to the Service Dept of the manufacturers—at least until they write and tell you to see the dealer. Should you find a dealer to whom this does not apply, he is worthy, not only of your business, but also of your recommendation.

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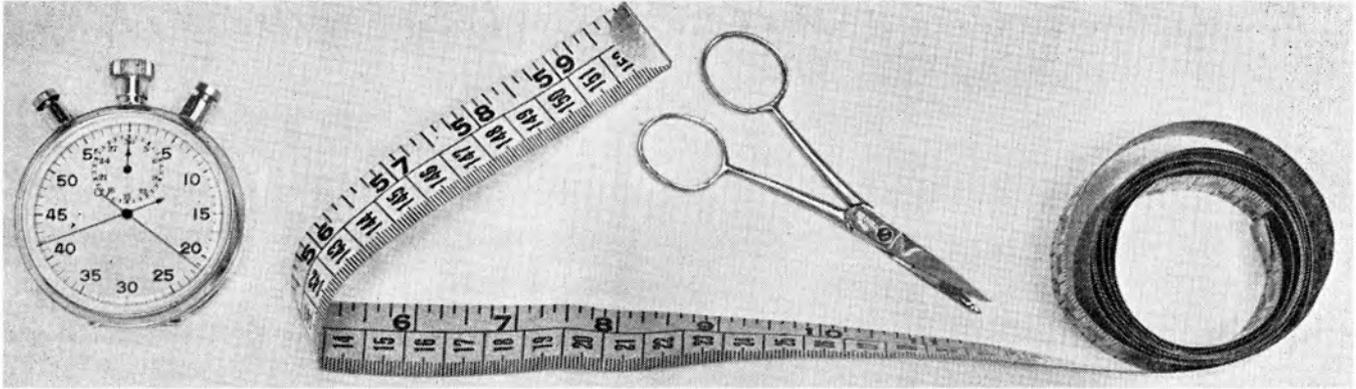
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editing with stop watch, tape and scissors

THE first article of this series suggested the making of a "Cue Tape", to save repeated re-plays of the film. This tape—a complete running commentary of all that is on the film, plus accurate time announcements of key points—can be used in conjunction with a set of cue sheets, so that a written record exists for the planning of commentary, sound effects and music.

The second article described the method of planning, writing, reading and recording the commentary. The next stage is the production of a sound track to link up with the film.

As the work deserves fairly close accuracy from this point on, the reader is strongly advised to buy a stop watch. It is a good investment, anyway, for anyone who is seriously interested in working with a tape recorder. Simple stop watches can be bought, new, for as little as £6; and very fine "ex Govt." used watches are available from the better class "Surplus" shops. £5 5s. 0d. will buy a continuous movement, split centre-seconds model. For £9 10s. 0d. there are really excellent 3-button models, in which the 1st centre seconds hand can be stopped and restarted, while the 2nd centre seconds hand can be stopped and released as required, while the centre button will "fly back" either the 1st, or the two together.

The seconds hand of an ordinary watch can be used, but the work is far more tedious and awkward. The other essentials are (1) a pair of scissors, (2) a tape measure—and preferably one which runs from 0 to 60 inches on one side, and backwards from 0 to 60 on the other. Finally, a tape splicing block and splicing tape, and a spare reel of blank, or erased tape.

SOUND AND CINE YOUR SOUND TRACK — PART 3

Assuming now that the film runs for 10 minutes, and that the recorded commentary has a total running time of 5 minutes, the problem ahead is basically simple. The 5 minute tape has to be extended in length to run for 10 minutes; and the exercise is to splice in lengths of blank tape between the sections of commentary. For the purpose of this article the $7\frac{1}{2}$ i/s tape speed is also assumed—the speed approximating to the 24 frames sound speed of a 16 mm. projector. For those who use 8 mm. film at 24 f/s, the same rules apply, with the figures divided by 2.

Begin with the cue tape and the cue sheet. Note the exact interval between the beginning of the film and the point at which the first piece of commentary should begin. Note also the exact interval from the beginning of the film to the point at which the second piece of commentary should begin.

Next, refer to the timing remarks on the commentary script. Assume that the first piece of commentary begins at zero + 10 seconds. Splice a leader to the blank tape. Run, say, 30 seconds of tape on to the take-up spool. Cut it, and splice in a short length of coloured leader, so that it provides you both with a possible starting point, and also a margin of safety to prevent the irritation of constant re-threading on rewinds. Using the tape measure, cut the (magnetic!) tape at 75 inches. Remove the spools.

Place the commentary spools on the machine. Turn the tape past the heads until the first syllable of the commentary begins. Leave an inch for safety and splicing, and cut. Or, if you prefer it, mark with a piece of splicing tape and wind on until the last sound of the first piece of commentary dies away. Mark that, too. Then lift the commentary spools from the machine. Cut out the length of commentary. Splice the beginning to the tail of the 75-inch length of blank. Splice the tail end of the commentary to the severed end of the spool of blank. Operation one is complete. Test it, using your watch.

Assume now that the second piece of commentary should start at zero + 20 from the beginning of the film. And assume that the first piece of commentary ran for 5 seconds. You need 5 more seconds of silence. With tape at 7.5 inches per second, $5 \times 7.5 = 37.5$ inches. So measure off that amount from the last splice, and repeat the procedure. It is advisable to keep a "Zero + 10: Zero + 40: Zero + 65 in. record running on your cue sheets as you proceed, in addition to the section-by-section timing of commentary and silence. This gives you a double check, and it also reduces the chances of any muddle.

After you have completed say a quarter of the sound track, run it through on the recorder, timing each section accurately as it runs, using the centre seconds buttons of your watch. Then, with these times carefully noted on the cue sheet, against the picture items you have previously noted, place the "Cue Tape" on the recorder and check the announced time with the sound track times.

With all the foregoing work, and with any subsequent tests, be sure that the recorder has been thoroughly warmed up by running at room temperature for about 30 minutes. This is, of course, most important. When you have completed your sound track of commentary, warm up both projector and recorder. Thread them up. Start them at Zero and note the results. To avoid the need for 3 hands, start your watch on the first syllable of commentary, and pencil down any inaccuracies on the Cue Sheet as the sound and film run together.

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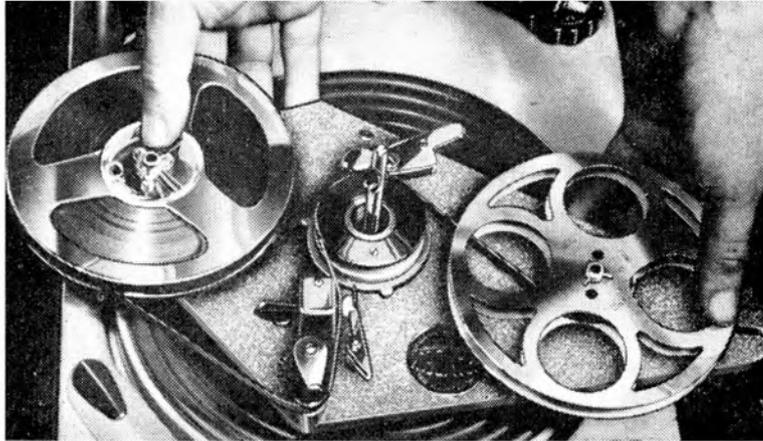
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★**Sibelius.** *Pelléas and Mélisande*, Incidental Music, Op. 46. *At the Castle Gate; Mélisande; The Three Blind Sisters; Pastorale; Mélisande at the Spinning Wheel; Entr'acte; the Death of Mélisande.* The Royal Philharmonic Orchestra, conducted by Sir Thomas Beecham, Bart. H.M.V. SBT 1255. 47s. 6d. 27½ mins.

Analysing the Beecham magic has long been something of a national or international pastime; not being much use with a hockeystick, I remain quite happy on the touch-line. Without recourse to adulation, this performance is as near sheer inspiration in its root meaning that mortals can hope to achieve. The phrasing alone is enough to make one adjust all previous standards of musicianship.

The recording is good, if on the mellow side; not a bad thing in this case. Thomas Bedwell

Arne. *The Cooper*, comic opera in one Act, adapted by Joseph Horowitz. Ann Dowdall (sop.), Eric Shilling (bar.) and Duncan Robertson (ten.), with the Intimate Opera Company, introduced and conducted by Antony Hopkins. Saga STF 4003. 40 mins. 55s.

Being an Irishman, I am allowed a certain latitude in these matters; in this particular case, while I would earnestly recommend those who have the faintest regard for 18th Century music to beg, borrow or steal this, I would think twice or more before I went out on a cold wintry night for a stage performance. On the other hand, that may not seem quite so Irish; for *The Cooper*, despite its inherent simplicity and charm, is no opera as we have come to know the word; indeed it is rather an exercise for a few friends in the drawing-room, or failing that, the gramophone or recorder.

It would be hard to gauge its effectiveness on the stage from the stereo recording. With just the three characters and a small chamber orchestra, a rigid barrier is set between Colin the apprentice and Fanny the ward on the left, the reasonably villainous Cooper Martin on the right and the orchestra in the middle—so much so that one might be listening most of the time to a concert and not a stage performance. Episodes like the arrival of Uncle Jarvis' letter, which causes a good deal of hearty swearing, are made for stereo, with voices appearing from all over the stage in the flurry. What is more, much of Mr. Hopkins' most able direction is wasted, as the voices, when segregated so severely, are never able to blend properly in duets and trios. Doubtless the engineers had good reason for all this, but it seems a pity.

The recording itself is good, though on the close side and lacking in resonance more generally. The voices are well served on the whole, except for Miss Dowdall's high notes, and the whole has been flawlessly edited, so that the performance bounces along merrily without inelegant gaps or pre-echo. The tape of course has one great advantage over the disc: after the first hearing, the spoken introduction can be painlessly removed.

★**Sullivan.** Overtures to *The Mikado, The Yeoman of the Guard, Iolanthe, Ruddigore.* The Philharmonia Orchestra, conducted by Charles Mackerras. H.M.V. SCT 1513. 7½ i/s. 55s.

This performance, which, apart from one e.p., is only available on stereo tape, is a landmark in more respects than one. Translating lofty thoughts into words is a mug's game at the best of times; here I would simply recommend any with a stereo deck to obtain by fair means or foul, and play, very loud and with plenty of treble boost, late of a Sunday evening, when full of the good things of life, and then again first thing on the Monday morning. Any performance and recording which stands up to this treatment will repay close study.

Suffice it that Mackerras and his merry band are on excellent form, with most beautiful precision and ensemble. Apart from a touch of pre-echo before *Ruddigore*, and 20 bars "stocktaking" in the middle of same (Toye, not Sullivan), no further comment.

Mark Taynor and his Western Band play in Hillbilly and Cowboy style. 20 numbers. Music on Tape No. 70-7163. 3½ i/s. 49s. (70-71127. 7½ i/s. 69s.).

As the title might suggest, this is jolly stuff, of the variety one might expect to hear when retreating from Waterloo station of an evening. Listening for an hour to this requires no imagination and less effort, though the persistent sharpness of the solo violin (intentional, I think) becomes tedious after a while. The material is moderately monotonous, each number being curtailed prematurely for some good reason, but old chestnuts crop up in odd shapes and sizes. Harmless, and pleasantly cacophonous.

Leo Chauliac plays Classical Piano Music. 8 numbers. Music on Tape No. 8867. 7½ i/s. 39s. (8833. 3½ i/s. 29s.).

An important principle is at stake here. A vast amount of what has come to be called "classical" music, for want of a better term, was originally written as background music for particular occasions; most of it has survived on its own merit, naturally, though an appreciable amount owes its existence today to the hysterical or long-haired reverence accorded by the minority who should know better. All this means, in effect, is that one should really judge classical music on its own merits alone, and if it happens to stand well in the background, leave it there.

Unfortunately, Mr. Chauliac is not your man in this field. His programme here, which ranges from the Adagio from Beethoven's *Sonata Pathétique*, via the odd Chopin waltz to Toselli's *Serenade*, is ill-planned, badly executed, and shockingly recorded. He wanders through quite oblivious of the composers' intentions; not a bad plan, some may say, but granted only on the assurance that the fresh music created is music, and recognisable to the ear as such. No more need be said, except that when he reverts to his own field, as in the Toselli *Serenade* and an *Intermezzo* by Provest, the results are most enjoyable.



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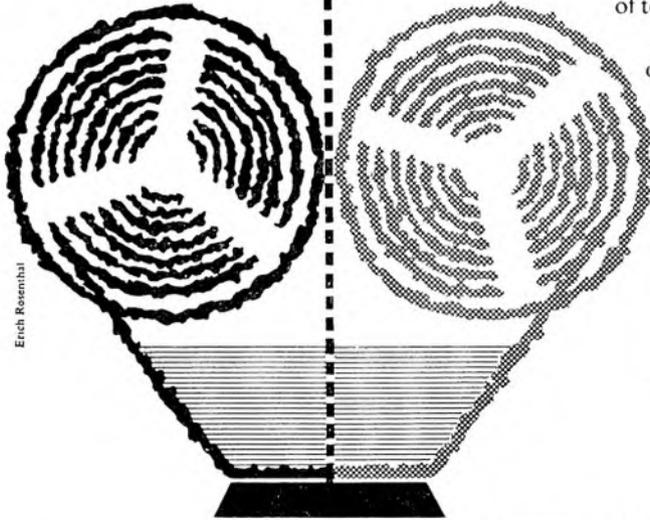
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EQUIPMENT REVIEWED

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**E.M.I.
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 TRANSPORTABLE
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 TR52**



★

Manufacturer's Specification: Tape speeds: $7\frac{1}{2}$ and $3\frac{3}{4}$ i/s. **Frequency response:** 50-10,000 c/s at $7\frac{1}{2}$ i/s, 50-6,000 c/s at $3\frac{3}{4}$ i/s, both ± 2 dB. **Wow and flutter:** less than 0.25% at $7\frac{1}{2}$ i/s. **Crosstalk:** -45dB. **Spool size:** $8\frac{1}{4}$ inch max. **Inputs:** two separate amplifiers each with 600 ohms and 30 positions, and switched bass cuts at 0, -5, and -10dB. V.U. meter and monitoring switchable to compare input and recorded quality. Stereo and mono recording and playback. **Dimensions:** 20 x $17\frac{1}{2}$ x $13\frac{1}{2}$ in. **Weight:** 80 lb. **Price:** £285. Manufactured by **The Gramophone Company Ltd., Hayes, Middlesex.**

★ * *

A GLANCE or even a close study of performance specifications is rarely of much value in indicating the performance of a tape recorder for, as with many other products, the less scrupulous manufacturer prepares his specification after looking at his competitors claims and hardly bothers to take measurements on his own machine. This is the real disadvantage in presenting technical data to the public, for a good sales manager can easily improve the performance even if the designer finds it difficult. There are many machines at prices below £60 with a performance that, judged solely on advertising claims, appears to be superior to the tape recorders used by professional recording engineers.

Varied facilities

However, specifications are of value in indicating the facilities provided, for this leaves little scope for the sales manager's inventive genius. In some respects the facilities provided by the TR.52 are unusual even in professional machines. It is a two track recorder, but the "electronics" include two separate record and replay systems with the switching sufficiently flexible to allow one track to be used for recording while the other track is being used to replay some previously recorded programme.

The V.U. meter can be switched to check the bias erase, the incoming signal, signal being recorded, or signal going out to line. An internal monitor speaker can be switched to check the incoming signal, the signal being recorded, or the outgoing signal. A monitor amplifier having an output of 3 watts drives the monitor speaker, but the performance is sufficiently good to justify the use of a high quality external speaker where the space is available. Separate output jack sockets, transformer coupled into the output stages, provide a maximum signal of about 7 volts across 600 ohms from each replay amplifier. Microphone equalization is introduced by a three position switch in each channel giving a loss of 0 dB, 5 dB and 10 dB.

Constructionally the TR.52 is unusual in that five separate electronic chassis are provided, interconnected through plugs and sockets that allow the individual units to be withdrawn and replaced in a couple of minutes in the event of a failure. This is undoubtedly an expensive technique but it is invaluable in professional work.

There is space for two $8\frac{1}{4}$ in. spools, the tape path between them being indicated by white lines on the surface of the deck.

This is a useful idea for the tape path is somewhat unusual. Distorted spools are the rule rather than the exception, but as an aid to dealing with this problem, a flanged guide pulley is mounted to control the height of the tape as it enters the take-up spool, a knurled knob providing height adjustment. This is one of the small refinements that assist in obtaining low values of wow.

The head assembly is also unusual for it contains no less than six heads. It has been noted that there are two separate record and replay systems allowing two tracks to be recorded simultaneously. This necessitates two erase heads, one half-track head erasing the top track and the second a full-track head erasing both tracks. These are followed by two record heads and two replay heads to allow the signal being recorded on the tape to be continuously monitored while recording is in progress. The head assembly cover carries two controls, a small lever which selects full-width or half-width erase and a knob which moves the tape on to the replay heads during high speed winding to facilitate cueing.

In front of the deck is a small sloping panel carrying all the monitoring controls and, as already indicated, the monitoring facilities are unusually thorough. A centrally mounted V.U. meter can be switched to read the input signal, the signal being recorded, or the signal leaving the recorder, a separate switch allowing either channel to be monitored. On the right hand side of the control panel are further switches that allow the monitoring amplifier and speaker to be switched to either channel to check ingoing and outgoing signals or the signal at the recording head.

Operation is facilitated by grouping all the signal controls
 (Continued on page 195)

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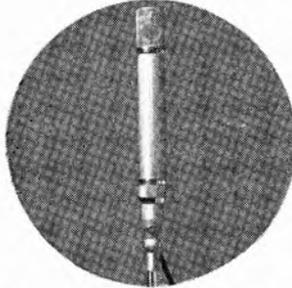
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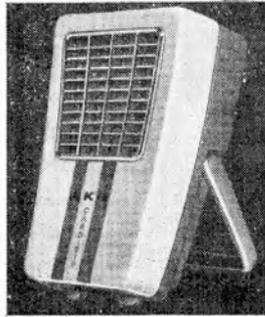
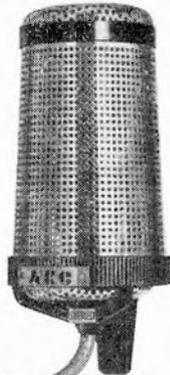
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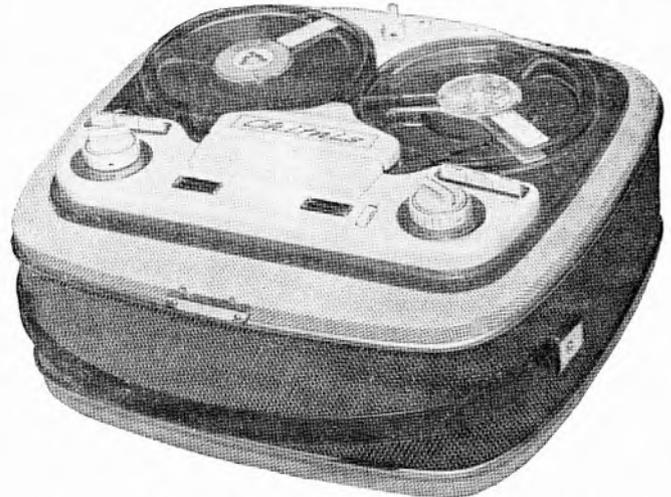
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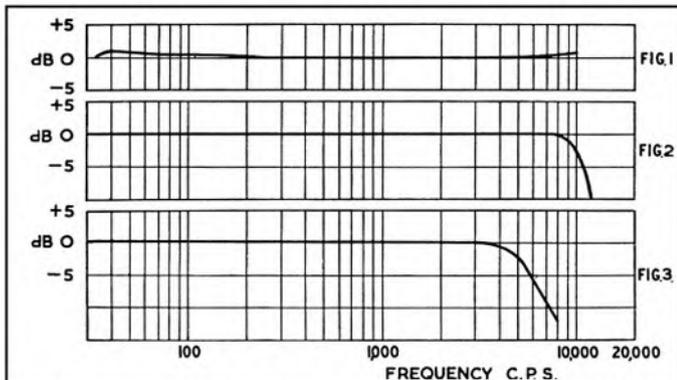
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TR52 REVIEW—(continued)

on another small panel in the front of the machine. This carries two input and one output jack socket for each channel, together with the recording level and replay level controls, the jacks, knobs and switches in each channel being arranged in one vertical line. The two input sockets for each channel allow the use of a low impedance microphone coupled in through a screened and balanced transformer, and for a signal to be taken in from a 600 ohm line through a balanced transformer,



but the two signals cannot be mixed through the controls provided. A separate input pre-amplifier ensures that there is sufficient gain for any ordinary microphone, only 100 microvolts being necessary to load the recording amplifier fully.

Separate pre-set gain controls on all the record and replay amplifiers allow the relative gains to be set to ensure that the signal output from the recorder is the same as the signal input when record and replay gain controls are set to the same positions.

Test results

The machine was put through the standard test routine with the following results.

Frequency Response: When replaying any of the commercially recorded tapes the replay response only is involved. Both channels were checked, using the E.M.I. professional test tape SRT.13, the response of channel 2 being shown in fig 1, though channel 1 did not differ from channel 2 by more than 1 dB at any point in the frequency range, and in fact the two response curves were within 0.5 dB over practically the whole range. The performance was not quite so good when recording and replaying, the result being shown in fig. 2. It will be seen that the frequency range is not particularly wide, but within the range it is remarkably smooth, an aspect of the performance which is given too little weight in current advertising claims.

There is no standard recording characteristic for a tape speed of $3\frac{3}{4}$ i/s, and E.M.I. make no wild claims for an ultra-wide response at this speed, but in fact the figure of -3 dB at 40 c/s and 8 Kc/s claimed was not met in the test machine as the curves of fig. 3 show.

It may be a significant comment on current advertising that neither of the professional machines recently tested had a frequency response comparable in bandwidth with many domestic machines, though both showed lower fluctuations within the range than the domestic machines with greatly improved signal to noise.

Signal/Noise Ratio: The ratio of the measured signal at the 2 per cent. distortion point, to the noise remaining after wiping a fully modulated tape, is shown in Table 1. The values are particularly good and would no doubt have been several dB higher if the tape had been as fully modulated as is usual in domestic machines where higher distortions are tolerated.

Wow and Flutter: Wow and flutter were measured for two conditions at each tape speed. When replaying a commercially recorded tape the total wow and flutter is substantially that due to the replay machine, for the wow in studio machines is very low in comparison. To simulate this condition the wow and flutter was measured using a 3 Kc/s tape recorded on a studio-type machine. When recording and replaying on the same machine the drive disturbances appear twice, once on record

and once on replay. This condition is obtained by recording and replaying a 3 Kc/s tone on the machine under test. Both sets of figures are quoted in Table 2, from which it will be seen that the performance is remarkably good. An aspect of this that is not shown up by the quoted figures, is that the total wow and flutter varies very little as between the start and end of a reel, nor did it exhibit any great variation from instant to instant.

General Comments: Sound quality is soft and smooth without a trace of harshness and is easy to listen to for long periods. As might be expected from the S/N figures, background noise is

Table 1		Table 2	
Signal/Noise Ratio		Wow and Flutter	
$7\frac{1}{2}$ " /sec.		$7\frac{1}{2}$ " /sec.	
Unweighted	48 dB.	Replay only	Flutter .06%
Weighted	60 dB.		Wow .08%
			Total .1%
$3\frac{3}{4}$ " /sec.		Record and Replay	Flutter .06%
Unweighted	46 dB.		Wow .12%
Weighted	58 dB.		Total .14%
		$3\frac{3}{4}$ " /sec.	
		Replay only	Flutter .08%
			Wow .08%
			Total .12%

exceptionally low. Sound quality when recording and replaying is very good indeed, no doubt due to the low values of wow, flutter and harmonic distortion.

Mechanically the machine is quiet and free from any undue vibration, even when rewinding at high speed. Most users would undoubtedly prefer push-buttons to knobs, particularly on the high speed wind and record-replay controls which are a little on the stiff side.

The TR.52 has a professional performance, but it will also appeal to the amateur who appreciates the degree of perfection achieved and can afford the rather high price.

J. Moir

(Reviews continued overleaf)

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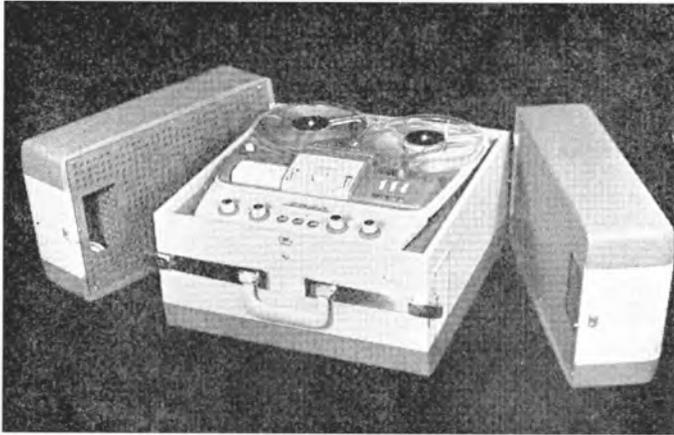
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The Grundig TK.60 Stereo Tape Recorder

Manufacturer's Specification: Tape speeds: $7\frac{1}{2}$ and $3\frac{3}{4}$ i/s. Frequency response: 50-15,000 c/s at $7\frac{1}{2}$ i/s, 50-10,000 c/s at $3\frac{3}{4}$ i/s, both ± 3 dB. Wow and flutter: less than 0.2% at $7\frac{1}{2}$ i/s. Spool size: 7 inch max. Outlet available from pre-amp. Magic eye level indicator. Stereo and mono recording and playback. Detachable loudspeakers. Dimensions: $27 \times 17\frac{1}{2} \times 12$ in. Weight: 54 lb. Price: £134 8s. Manufactured by Grundig (Great Britain) Ltd., 39/41, New Oxford Street, London, W.C.1.

THE TK.60 is one of the few tape recorders with facilities for stereophonic recording and replay, and at the same time incorporates in the machine two power amplifiers to drive the loudspeakers. Even the loudspeakers are included, the two units being clipped on to the sides of the recorder cabinet so that it is easy to detach them and mount them spaced well apart, preferably in two corners of the room.

The complete unit including loudspeakers is inconveniently transportable, the weight being about 60 lbs., but of this total, the two speakers account for about 15 lbs. Neglecting the speakers, the overall size of the recorder is $15\frac{1}{2}$ in. \times $16\frac{1}{2}$ in. \times $10\frac{3}{4}$ in. and the weight about 45 lbs., quite an achievement to get so much high quality equipment into this space and weight. The two speakers add another $9\frac{1}{2}$ in. to the width when clipped on to the recorder. The case is plainly but attractively finished in two shades of grey plastic, with lacquered brass clips and locks and the lid can in fact be locked, an advantage when there are children in the house. As is now common, the lid can be lifted off its hinges to give unrestricted access to the deck but there are no storage clips inside the lid to take spare spools.

The deck layout is substantially the same as that of the TK.35 reviewed in the February 1959 issue of *The Tape Recorder* with some extra controls for the stereo facilities. A stereo/mono switch, balance control, additional sockets and extra input and output switches have been added. Indicator lights are provided to show whether "Stereo" or "Mono" is in use and the usual Grundig facilities of "Instantaneous Stop" and "Superimpose" are added.

Each clip-on speaker has a five foot plastic extension lead terminating in a multi-pin plug to fit sockets in recessed panels in the side of the machine, but additional three-pin sockets have been added to take separate 5 ohm external speakers. The performance of the recorder is so good that it fully justifies two external speakers of much higher calibre than those supplied with the machine. At the back of the machine are two small recesses covered by spring loaded covers. One recess encloses the mains socket and a socket for a remote control unit, and the other houses the mains voltage selector, fuses, gram and diode input sockets and a socket providing a signal of about half a volt across 4-7 K from each channel. These allow separate high power amplifiers to be used when necessary. Apart from these two input sockets in the rear, there are three sockets on the front taking left and right microphones while the third allows any of the special stereo microphones to be used. These are of several types, the most elegant being a combination of a cardioid and a figure of eight unit in a single housing for M/S stereo recordings.

Though test machines are always run for a couple of months in domestic use before taking any instrumental tests, it is more logical to present the objective test results before discussing subjective reactions to a machine.

Frequency Response

Frequency response of both channels was measured using E.M.I. test tape SRT.13 but as they differed by less than 1 dB in any part of the range, only the response of the left hand channel is shown in Fig. 1, though this is given for the two extremes of the top and bass tone controls. The difference between the two channels could easily be corrected by the balance control which introduces a differential of about 1 dB per division.

Fig. 2 indicates the combined record and replay characteristics for "maximum bass" and "maximum top" positions of the replay tone controls. The control positions giving the flattest overall response are not indicated in the Instruction Book.

Fig. 3 indicates the combined record and replay response at a tape speed of $3\frac{3}{4}$ i/s, and while this is naturally not so good as can be achieved at the higher tape speed, it is still very satisfactory.

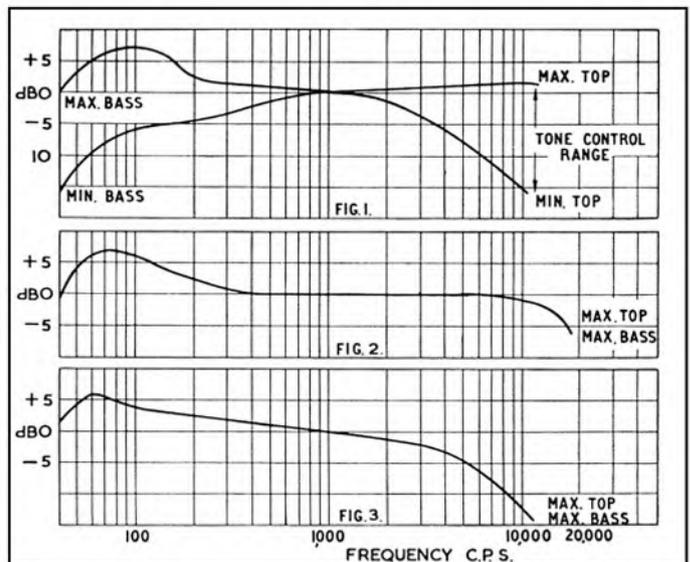
Signal/Noise ratio

Table 1 lists the measured signal/noise ratios, the figures being the ratio of a 1 kc/s signal recorded at full modulation as indicated by the magic eye, to the noise remaining after the signal has been erased on the machine. A figure of 40 dB is claimed, though it is not indicated whether this is the weighted or unweighted value. Though an unweighted value of 40 dB was barely attained on test, it was handsomely exceeded by the measured weighted figure. The reel of tape supplied with the machine was extremely noisy, a run through the machine on "Record" but without any input signal, reducing the tape noise by about 10 dB.

Table 2 indicates the measured values of wow and flutter, a G-B. Type 1740 meter being used. The figures obtained are better than those claimed in the Instruction Book, careful listening tests confirming the measured values.

Cross-talk

One of the limitations on the performance of a stereo disc is cross-talk between channels. Having two entirely separate tracks, stereo tapes are relatively free from this particular trouble. A pickup that has a cross talk ratio of better than 20 dB is outstanding, whereas



the TK.60 had a figure of 50 dB, though it fell a few dB below this at the top of the frequency range. As this was the combined record and replay cross-talk, it is obviously no problem in a good tape recorder.

Subjective reactions

The machine ran very smoothly and quietly with very little mechanical vibration. Spooling was good, the tape being wound evenly and tightly even when using the high speed wind or rewind. Rewinding

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1,800 feet of tape took approximately 3½ minutes with the tape running in either direction. The brakes were good, though they left about a couple of inches of slack tape when the tape transport was stopped with only a few feet of tape on the left hand spool. This is an acid test of a drive system and one that some professional machines fail.

This is a good tape recorder for either monophonic or stereo tapes. I have noted previously that many stereo reproducers are little better than two loudspeakers on a single output, though I do not know just how this result is achieved. The performance of the TK.60 replaying commercial stereo tapes was very satisfactory, the virtual stage extending over all the space between the loudspeakers. Images were

Table 1		Table 2	
Signal/Noise Ratios		Wow and Flutter	
7½ in./sec.:		7½ in./sec.	Flutter 0.1%
Unweighted ...	37 dB.		Wow 0.05%
Weighted ...	54 dB.		Total 0.11%
3¾ in./sec.:		3¾ in./sec.	Flutter 0.14%
Unweighted ...	36 dB.		Wow 0.09%
Weighted ...	52 dB.		Total 0.16%

relatively sharp and well defined and the overall stereo impression was excellent, a view that was shared by another couple of expert listeners who happened to hear the machine on test. The undistorted volume available from the two (nominal) 4.5 watt output stages was surprising. Using a couple of Goodmans Sherwood enclosures, it was far more than adequate for a 18 ft. × 14 ft. room, even for a family that "likes it loud."

With the two clip-on loudspeakers supplied, the performance was less satisfying, understandable in that these speakers occupy less than one sixth the volume of the two Sherwoods. It is debatable whether the purchaser of such a good stereo reproducer would be satisfied with the restriction in performance imposed by the use of such small speakers. From this point of view, and with portability in mind, it might be more useful to market the tape machine as one package, with the two speakers as a separate optional package. Where portability was paramount the purchaser would probably use the two small Grundig speaker units but where sound quality was of more importance, he would undoubtedly choose larger speakers.

Microphones for stereo

To anyone with experience in monophonic recording, a stereo tape recorder opens up a fascinating new field for experiment. Microphone placing for monophonic recording is more art than science and the determination of the optimum position for stereo recording is an even more intriguing problem. Two Grundig GCM/3 capacitor microphones were supplied for test but though they are good and very reasonably priced units, their near omni-directional polar diagrams make them somewhat less than optimum for stereo use. Two bi-directional ribbons are capable of much better performance but the connoisseur will probably choose one of the cardioid/bi-directional combinations designed specifically for stereo use.

The TK.60 is a high priced product and a purchaser with this sort of money may well be in doubt about the conflicting merits of a high priced monophonic machine of professional grade and a domestic stereo machine of the TK.60 type. For me there is no doubt that the overall sound quality from a stereo machine of this standard is superior to that from a professional grade monophonic recorder.

In short, a very good buy, particularly if you manage to persuade Grundig to supply it without the small speakers. **J. Moir**

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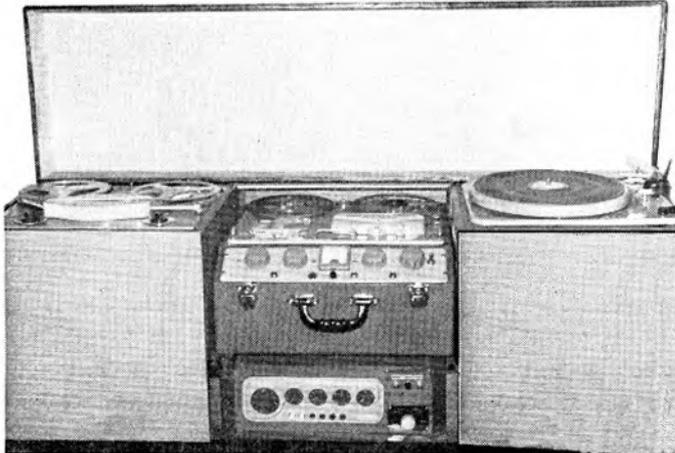
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our readers write

. . . about being a fanatic

From:—Wemyess Craigie, 6 Saint Giles Street, Edinburgh, 1.

Dear Sir:—I have been a reader since the first number, and I still enjoy the Magazine immensely. For some time now I have been wondering if you might be interested in publishing one or more of the enclosed photographs of my equipment, which I have



just recently fitted into a cabinet of my own design and building. In case you are, here are the details of the equipment:—

(1) Brenell Tape deck (on the left) for playback only, mainly used for copying from tape to tape, coupled to the main amplifier via a specially built tape-head booster pre-amplifier. (2) Ferrograph 4A tape-recorder, which can be easily disconnected, and slid out to make recordings outside the house whenever necessary, in the normal way. (3) Jason Prefect switched VHF tuner, coupled to main amplifier. (4) Quad main amplifier (actually situated below the record-turntable) coupled of course to its: (5) Quad control unit (6) Lenco transcription turntable with Goldring 600 head with diamond stylus (7) Special switching arrangements for tape and radio units together with main switch.

The loudspeaker unit, separate, is not shown: this is a Golden Wharfedale mounted in an infinite baffle cabinet set in a corner window. The total cost of the equipment including the cabinet comes to well over £200, not including ancillary gear such as two microphones, mixer unit, tape-splicing gear: and some 130 tapes, LP and standard, to say nothing of an LP collection of over 300 10 in. LPs, 200 12 in. LPs, and 1,000 78s and 45s.

Does this make me an enthusiast? My long-suffering wife thinks I am: in fact, she uses the term hi-fi fan: but I think she uses that word in its elongated meaning: fanatic!

With all good wishes for the continued excellence of the magazine.

Yours sincerely

. . . about unravelling

From:—L. F. Taylor, 17 Cascade Avenue, Muswell Hill, London, N.10.

Dear Sir:—On the second evening after buying a tape recorder, I was listening to a recording of some piano music made direct from the radio the previous evening. I was listening to the playback through an extension speaker in another room and was feeling very disappointed with the considerable wow, when suddenly the recording ceased. Assuming that the tape had broken, I dashed into the other room to find that the tape had indeed broken, but right at the beginning of the recording, not at the moment when it ceased. The tape had been driven past the replay head without the assistance of a take up spool, and I was confronted with about 1,000 ft. of tape coiled all over the floor, one loop of which had jammed the spool into stopping.

I decided that any attempt to unravel what appeared to be a hopeless tangle, would only make matters worse, so took a chance

and pressed the rewind button. To my relief the whole of the tape was automatically picked up and rewound on to the original spool. As I wanted to record something else immediately after this incident I attempted to splice the break in the tape with EMI C.A. tape jointing compound, but found that this would not bond the two pieces of P.V.C. tape. In desperation I tried a spot of 'Uhu,' the only other adhesive to hand. I was pleased to find that I made a completely noiseless joint. Perhaps one of your experts would like to tell me if this joint is not likely to be the permanent one I think it is.

Yours sincerely

Most tape users will have experienced this trouble with tape coiled all over the place, or may have deliberately spooled on to the floor in assembling edited tape programmes. As you have discovered, it often pays to leave well alone, and spool back. In the case where the tangle will not undo easily, fast rewinding may be impracticable, and the alternative of taking up at 7½ i/s etc. is terribly slow. In such a case we have often placed the reel on a gramophone turntable and re-spooled in that way. The Uhu joint will not be permanent and some gum may be pushed out on to adjacent turns of the spool.

* * *

. . . about tape in Canada

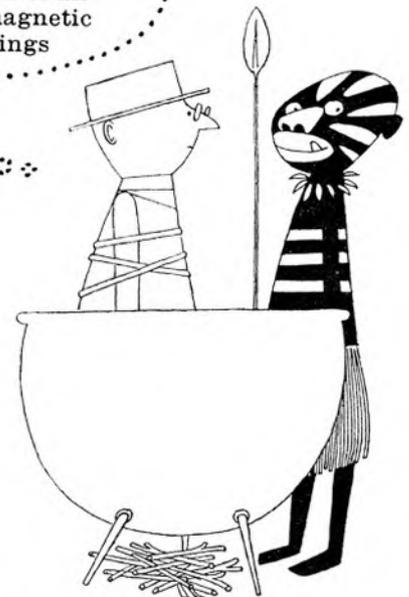
From:—Gerald E. Bryan-Smyth, Apt. 24, 6 Park Place, Westmount, Montreal, Canada.

Dear Sir:—I am receiving your magazine regularly, and, as an Englishman, I am most interested to see how the tape recorder industry, and Hi-Fi are developing in England. However, I am writing to you in the hope that you can fill me in on several points which I do not quite understand.

Over here, there are many different tape recorders available from single motor, (4 pole) two head, single speed units to mach-

(Continued overleaf)

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READERS' LETTERS—(continued)

ines having 3 sync. motors, 3 heads, 10½ ins. reels, etc. Each manufacturer here makes his own recorder completely, as opposed to the evident British system of everyone using the same deck then constructing their own amplifier to go with it. (I am thinking of the ubiquitous Collaro).

Although such British machines as Ferrograph, Vortexion and Brenell are seen over here, I see no mention made of American machines in England. Why is this . . . ? . . . though in my opinion, only the large American Ampex recorder can compete with the Ferrograph! Also, why aren't British manufacturers making their own decks?

Here, on quality machines, (all going Stereo like mad for recording and playing) three heads are fitted and two separate amplifiers: one for recording and one for playback, allowing one to monitor directly off the tape. (Some machines have four and five heads for superimposing on a recorded tape by placing a replay head before the erase head, and feeding the signal through a mixer to the record head, with the second signal). Echo effects can also be obtained with these machines. Are there any British machines incorporating these features, at the same time having wow and flutter figures round about 0.15 per cent. at 7½ i/s?

I own an Ampex model 600 machine that records ½ track at 7½ i/s only. Drive is by a single synchronous motor and, despite this, wow and flutter are down to a genuine 0.17 per cent. It has an eight valve amplifier incorporating (1) a low impedance mike amplifier, (2) a high impedance line amplifier which can be electronically mixed, and (3) a playback pre-amplifier high impedance. A V.U. meter is fitted which works on all functions, so that a comparison can be made between the signal going on to the tape and that coming off it, by a two-way switch.

The sound man is well catered for here (there's a lot of junk thrown his way too!) and I wonder if you would let me know the answers to my questions. Should you, or any of your readers be interested I would be only too glad to record a tape and go into more details of the things that are being done with tape on this Continent.

Finally, please publish this letter if you feel that it will interest readers, and let people know that I shall be happy to "tape-pond" at 7½ i/s, half track, 1,200 or 1,800 ft. reels. (The 8¼ inch reel is unknown here as they use the 10½ inch size.)

Yours truly

It is quite possible to obtain British tape machines which incorporate facilities such as "comprehensive check" i.e., continuous monitoring, mixing, and superimposition. However, the extra heads and amplifiers are naturally not fitted in the inexpensive domestic models. We are glad to hear that British tape recorders are to be found in America, and feel sure that the best representatives will give a good account of themselves. American equipment has not so far been available in this country due to the existing import restrictions, but these are in process of being relaxed. For example, a range of Ampex recorders has just been announced by Rank Cintel Ltd. In this connection, we feel that your comparisons of British/American machines were a little unfair, e.g. the Ampex 601 is priced at £295! (Editor).

. . . about tape control

From:—A. Fisher, 311 Brithweunydd Road, Trealaw, Glam.

Dear Sir:—Several articles dealing with the labelling and identifying of tapes have been published in your magazine and all of them suggest writing the list of contents on either the leader tape or the reel. This is all right as long as each side of a reel contains only a limited number of items. If however, short pieces e.g. songs, arias are recorded on a 7 inch reel L.P. tape, the list will be too long to be written on tape or reel and I would like to describe the way I have built up a record library, enabling me to find any recording in a matter of seconds.

(1) Each reel is fitted with two transparent pockets about ½ × ¼ inch, stuck on both sides of the reel with sellotape. Numbered cardboard inserts are slid into the pockets in the following way:—

1st. reel: Inserts No. 1 & 2. 2nd. reel: Inserts No. 3 & 4, and so on.

In other words, each side of every reel has its own insert number. When the first reel, insert 1, has been played, it is no longer necessary to wind the tape back from the take-up spool to the first reel. All that is required is to remove both inserts from the now empty first reel and insert them into the pockets of the full reel. This by the way, is now wound to play No. 2 without rewind. It may happen that No. 2 is not played immediately, the reel will thus be put into its box which is marked with the same numbers as the reel insert numbers, in our case No. 1/2, and will only have to be rewound if No. 1 is to be replayed at the next occasion.

(2) The next step is to build up a card catalogue. Each card refers to the recordings on one particular reel and is split up into two sections showing the two insert numbers of the reel with all the essential information.

(3) In addition, an alphabetical index is installed, referring to the composer's name and/or the type of music (Symphonies, Concerts, Operas, Arias), and against each entry is shown the above mentioned insert number only.

If e.g. the Mozart Don Giovanni Overture is required, the item will be found in the alphabetical index under "M" and the insert number may be 7. The card 7/8 is now looked up and shows that the Don Giovanni Overture is on insert 7 and starts on, say, counter number 250. The reel No. 7/8 is now fast wound to counter number 250 and ready for playing the Overture.

This system has proved very useful over a long time and can be recommended to all serious users of recorders.

Yours faithfully

... more about unusual tape speeds

From:—H. D. Ainger, 6 Learmonth Gardens, Edinburgh, 4.

Dear Sir:—Owners of the versatile Gramdeck may or may not know that:—at 78 Gramophone r.p.m. the tapes turn at $7\frac{1}{2}$ i/s, at 45 Gramophone r.p.m. the tapes turn at 4.33 i/s, at $33\frac{1}{3}$ Gramophone r.p.m. the tapes turn at 3.20 i/s. This is when working at 50 c/s. It is interesting to know that a recording done at 45 r.p.m. if played back at 60 c/s will, as near as darn it, be at $3\frac{3}{4}$ i/s and is good for speech and music. I use this 45 r.p.m. speed when communicating with a cousin in the Royal Navy whose tape recorder has to be used at 60 c/s on board ship. Results are excellent. He records back at $3\frac{3}{4}$ i/s (60 c/s), and I play back at 45 r.p.m. on the Gramdeck and the difference in cycles is taken care of in the playback.

Perhaps the only disadvantage of the Gramdeck is its inability to play or record at exactly $3\frac{3}{4}$ i/s (the popular speed). This difficulty can be easily surmounted in a very simple way. Here are the instructions:—(1) Remove turntable of gramophone; (2) Find main turntable driving spindle and locate thereon the segment which gives $33\frac{1}{3}$ r.p.m.; (3) Go to the medicine cupboard and find a roll of very thin, very flexible (most important) very sticky finger tape of the waterproof variety. I use a product called "Sleek"; (4) Cut a small

(Continued overleaf)



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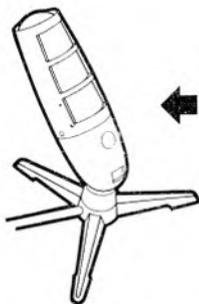
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OUR READERS WRITE—(continued)

strip the exact width of the $3\frac{1}{2}$ segment of the main driving spindle. The strip will be approximately 1 in. long.

Wrap this strip very carefully round the $3\frac{1}{2}$ segment and make sure there is no crease. Knead in the end so that there is no protrusion (this is why it must be flexible). This will add about $1/32$ nd of an inch to the diameter of the $3\frac{1}{2}$ driving segment and will increase the speed of the turntable to 39 r.p.m. If you refer back to the table given at the beginning, and do a bit of simple arithmetic, you will find that 39 r.p.m. gives you a tape speed so near $3\frac{1}{2}$ i/s that results are excellent on speech and music.

Similar experiments can be tried at other speeds, but the one illustrated is probably the most useful because it is thought that most Gramdeck users will, normally, use 45 r.p.m. (4.33 i/s) as this speed provides excellent tape economy and, anyway with a transcription turntable, there is no discernible wow. This leaves 78 r.p.m. ($7\frac{1}{2}$ i/s) for any super special recording and the $3\frac{1}{2}$ (3.20 i/s) is kind of spare. Finger tape it as described and you will have a real use for this last speed.

Now for the immediate criticism. It won't last and the finger tape will wear at once. You are wrong! The degree of pinch between the main driving spindle through the idle driving disk and the turntable edge is so slight and the pressure on the (waterproof) finger tape is so slight that it lasts (its easily renewed anyway once you have calculated the length of finger tape which results in 39 r.p.m.).

Mark your turntable, check revolutions with a watch, and adjust the amount of finger tape to give 39 r.p.m. or whatever other speed you want. An improved method is, obviously, to fit another main driving spindle with segments giving usual driving speeds, but one of the leading manufacturers to whom I wrote could not supply. Necessity is the mother of invention. *Yours faithfully*

* * *

... about threading tape

From:—Wm. A. C. C. Smith, 73 King's Road, Windsor, Berks.

Dear Sir:—Apropos Peter D. Turner's recent letter concerning tape threading, I find myself in complete agreement with his sentiments. However, the majority of your readers (especially the "morons") may be grateful for an extremely simple, yet efficient—or so I find it—method devised by myself to render tape-threading *really* effortless, and to prevent even the most ham-fisted from chewing the ends. The method is as follows:—

Fold the last half-inch of the tape (leader) back upon itself. Cut approximately half-inch of jointing tape and place the leader centrally and cross-wise on it. Fold the ends of the jointing tape down over the folded leader, being very careful to align the folds of the jointing tape with the edges of the leader. Press down. It will now be found that this stiffened end will prevent the tape from sliding out of the spool slot, and virtually eliminates the necessity for holding on to the end for two or three revolutions in the case of BASF, Emitape, and similar type spools, and is 100 per cent. successful for Hublock spools. *Yours faithfully*

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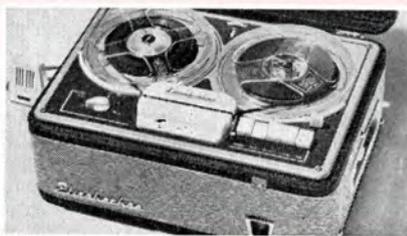
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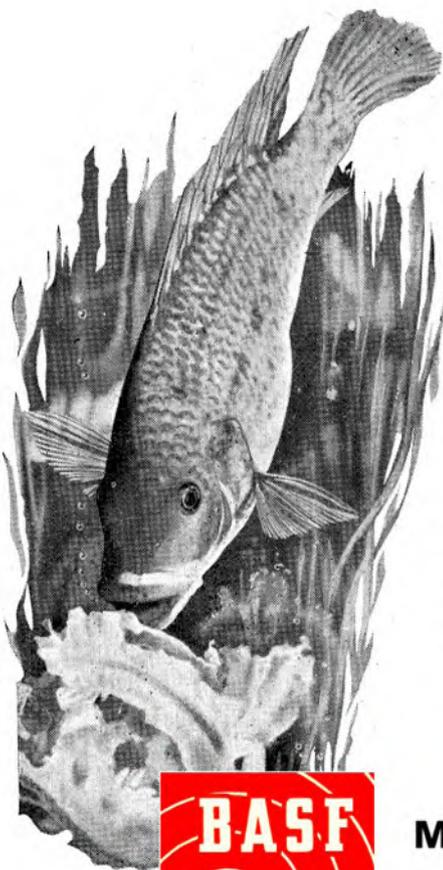
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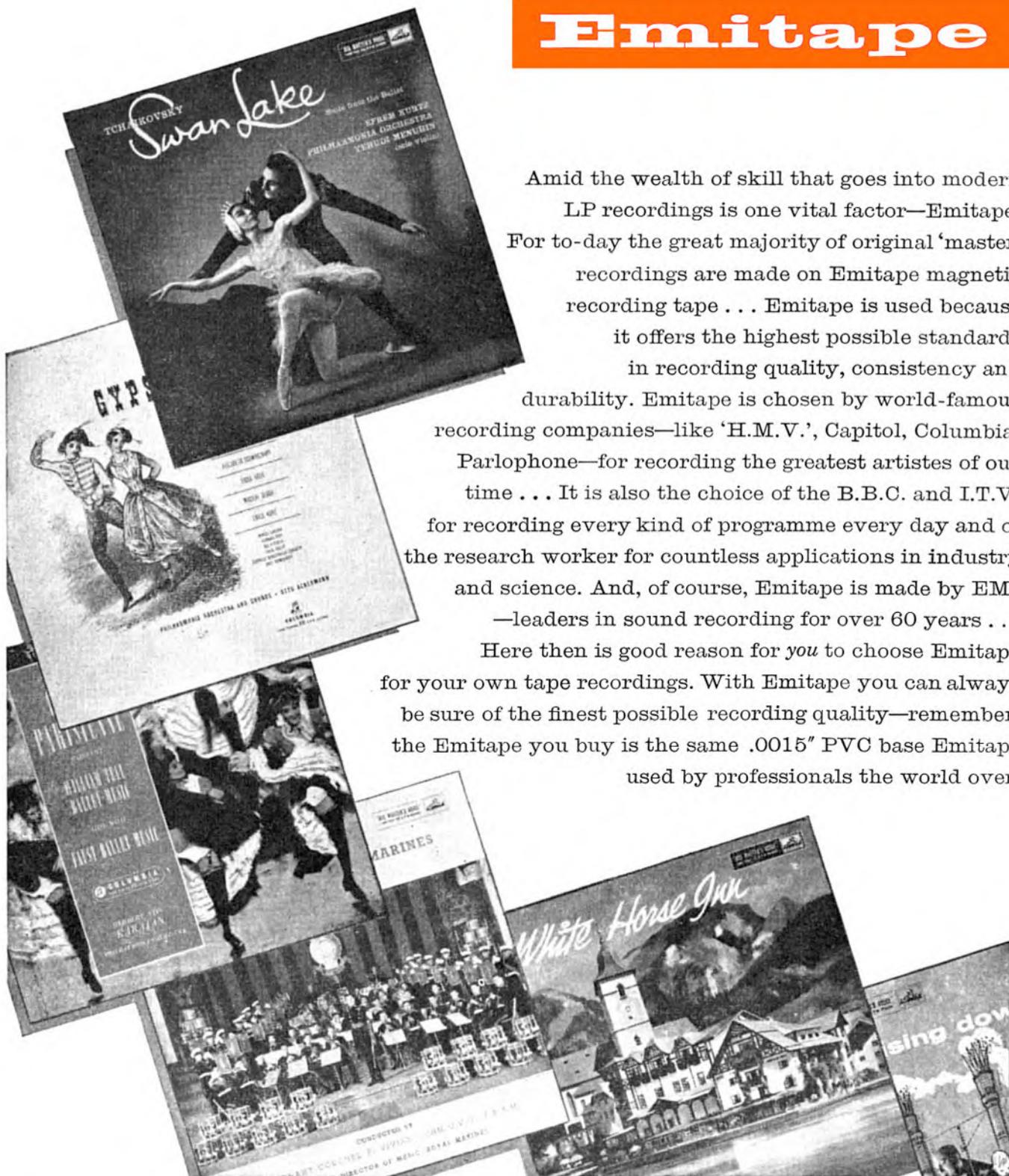
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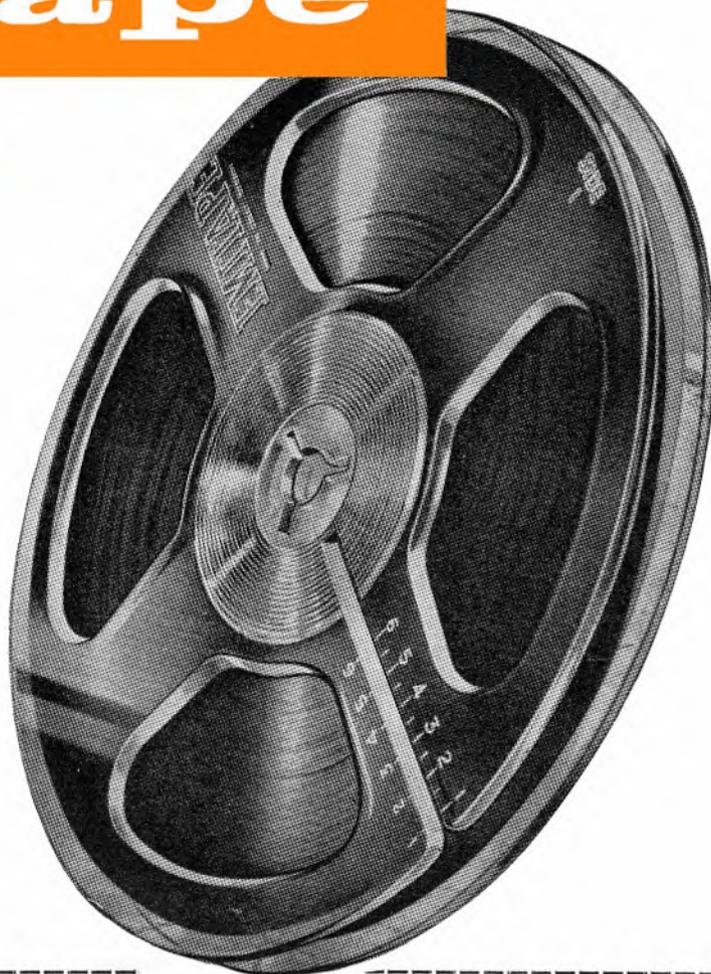
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