

# TAPE

RECORDING MAGAZINE

JULY 1962

1/6



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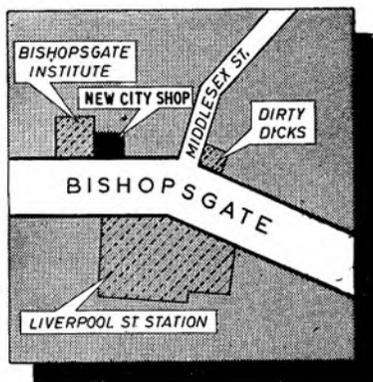
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**MARK 5: 64 GNS**



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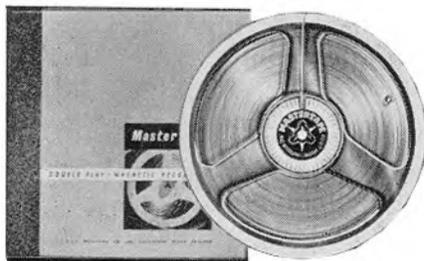
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# TAPE

RECORDING  
MAGAZINE

Vol. 6

No. 7

July 1962

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COVER PHOTOGRAPH: A recording engineer of Livingstone Recordings Ltd., prepares the Nagra IIIb battery recorder for a recording session in the field, using a highly directional American microphone. The story of the manufacture of this unique recorder is told on page 19 of this issue.

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FLE 1455

**EDITORIAL**

**ADVERTISING**

Editor,  
R. DOUGLAS BROWN

Assistant Editor, FRED CHANDLER

Advertisement Manager,  
MISS PAMELA DURHAM

# THE EDITORIAL VIEW

IF, in addition to a battery recorder, you want some reading matter to take with you on holidays, there is no shortage this year. I have been browsing through a heap of new books and booklets which have dropped on my desk during the past couple of months.

The most interesting of them, inasmuch as it breaks new ground, is Fred Judd's *Electronic Music and Musique Concrete* (Neville Spearman, 16s.). The only thing I have against this book is its price—sixteen shillings for 92 pages is a bit steep. Enthusiasts who want to experiment in a new field, however, will doubtless find it well worth the money, for it is full of severely practical advice and the presentation, including lavish illustration, leaves nothing to be desired.

Mr. Judd is a prolific writer, for he has also produced "*Tape Recording for Everyone*" (Blackie, 10s. 6d.). This is at the opposite extreme; it is another simplified introductory guide to tape recording: straight-forward and comprehensive, but with the accent on a technically-minded enthusiast's interests.

Mr. G. R. Pontzen, of Lustraphone, has written a very useful short guide to *Microphones* (United Trade Press, 3s. 6d.). This is a reprint of three articles dealing with the various types and characteristics of microphones, their design and construction, and their practical applications. It is surprising how many tape enthusiasts are content to remain almost ignorant about microphones they use. Mr. Pontzen has provided them with the means to inform themselves in a couple of hours' reading.

John Borwick has performed the same service in regard to speakers, with his

## BRITISH AMATEUR TAPE RECORDING CONTEST 1962

THE closing date for entries is June 30. If you have not already done so, complete your entry immediately and post to British Amateur Tape Recording Contest, 7, Tudor Street, London, E.C.4.

Judging will take place during July and the results of the British Contest will be announced in August.

The panel of judges will include:  
**MICHAEL INGRAMS**, famous television producer and script-writer;  
**JOSEPHINE DOUGLAS**, TV personality who has been associated with the Contest since its inception;

**TIMOTHY ECKERSLEY**, Assistant Head of Central Programme Operations (Recording);

**JOHN BORWICK**, well-known author, journalist and broadcaster on audio topics.

**ALAN STABLEFORD** and other representatives of the Federation of British Tape Recording Clubs—which is closely associated with the sponsorship of the Contest—will also take part in the judging, with the Editor of "**TAPE RECORDING MAGAZINE**."

Next month we shall announce the exciting programme which is being arranged for the Contest winners.

The best British tapes will, as usual, form the national entries in "**CIMES**"—the international contest—which, this year, takes place in Strasbourg in October.

*Loudspeaker Guide* (Focal Press, 7s. 6d.). Again, too many users know too little about their equipment. Mr. Borwick starts with a skilful explanation of the nature of sound, describes the principle of speaker reproduction, describes and discusses the various types, gives a great deal of practical advice on their use, offers interesting and valuable thoughts on "the listening room" and ends up this *tour de force* with some hints on home construction of a speaker cabinet.

In the same series of Focal Sound-

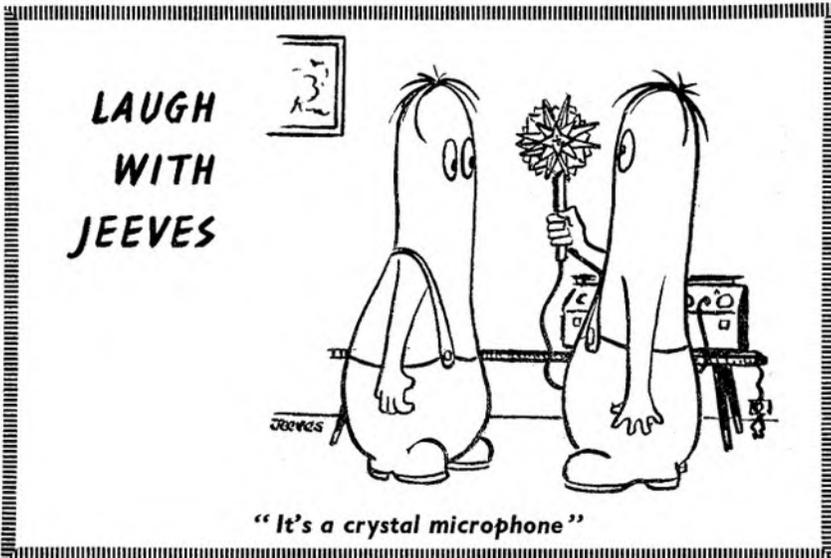
books there are two other new titles: Frederick Purves' *Bird Song Recording* and H. Woodman's *The Dramatape Guide* (each 7s. 6d.). This latter, subtitled "How to produce play readings on tape" should be invaluable to drama and play-reading groups making their first acquaintance with tape, as it summarises conveniently a great deal of information which might take a long time to acquire by trial-and-error methods.

Finally, a book which provides further evidence of the importance of reproduction equipment in contemporary life. John Cain's *Talking Machines*, published at 10s. 6d. in the Methuen's Outlines reference library intended for school-children. This is a handsomely-produced volume, eschewing technicalities, telling simply and enthrallingly the story of recording and reproduction—disc and tape. An old story, no doubt, but this account will reach a new audience, and should do its job well.

A BRIGHT idea from our American contemporary, *Tape Recording*: let the children act and record the parts from their favourite comic strip. I guess some care needs to be taken in selecting the best strips, in which the words in the "balloons" will be sufficiently explanatory of the action.

With a little ingenuity, using daily paper strips, it should be possible to work out a party game for adults!

THE EDITOR



# "POP" TAPE ISSUES BY E.M.I.

## Sinatra or Shapiro at 3 $\frac{3}{4}$ ips

FOR the first time, tape records by the biggest of current pop music stars are on sale. Albums by Cliff Richard, Frank Sinatra, Ella Fitzgerald and Shirley Bassey are among the first issue of a new E.M.I. 3 $\frac{3}{4}$  ips series. All are big sellers in the LP disc versions.

Important film sound-tracks are represented by *The King and I* and *Gigi*. From the theatre is the London cast recording of Rogers and Hammerstein's *Sound of Music*. Included, too, is BBC-TV's *Black and White*

### Special Report

by

DON WEDGE

*Minstrel Show*. They are issued in mono only. Most cost 35s.; the equivalent discs sell at 34s. 4 $\frac{1}{2}$ d. Two—Sinatra's *Songs for Swingin' Lovers* and *The King and I* cost 38s., a half-penny cheaper than the comparable disc.

The first batch went on sale on June

15. Monthly editions will begin in September.

All but one of E.M.I.'s labels are involved except the new Stateside, which was launched the same day. In addition to H.M.V., Columbia and Parlophone, there are records from the firm's American subsidiary, Capitol, and its main U.S. licensors—M.G.M. and Liberty. An omission is Mercury, which is now owned by Philips of Holland.

They are the first tapes released by E.M.I. since October, 1959. Officials conceded that the first issue was experimental.

"We don't yet know who we are catering for", said marketing manager R. N. White. "We considered more than 500 records and tried to pick a mixed bag of 18 for the first issue."

E.M.I. estimates that there are now more than one million tape recorders in use in this country. There was sufficient 3 $\frac{3}{4}$  ips machines—owned by teenagers in particular—to launch a major series of pop tape discs.

There was also the problem of pirating. The provision of tapes by important artists should reduce this.

Several of the records are relatively new. All were chosen because the disc versions are currently big sellers irrespective of when issued. In the older group is *Songs for Swingin' Lovers*, Frank Sinatra's biggest selling LP. Issued in 1956 it sold enough in the first few weeks to enter the singles hit parade. E.M.I.'s biggest selling disc LP's have been film sound-tracks. *The King and I* represents this group. It was also first issued in 1956.

Providing contrasts are the Jimmy Shand band's *Step We Gaily* and the Sadler's Wells Theatre's *Orpheus in the Underworld*, but the emphasis is on the sort of artist who features in the current hit parade.

The early hits of Connie Francis, Bobby Vee and Johnny Burnette figure in their records. The last two were not issued on discs until this spring. Released only in December was *The Young Ones*, the sound-track of the record-breaking Cliff Richard film. Helen Shapiro's *Tops with Me* was another 1962 issue. There are also albums by Peggy Lee, the Acker Bilk band, Adam Faith and The Temperance Seven.

This emphasis on current pops is new to the British tape market. E.M.I. was the first to issue music on tape here in September, 1954. At first issues were 7 $\frac{1}{2}$  ips mono only. Stereo tapes followed in October, 1955. There was some pop issues, but almost all were standards, most of the issues were classical.

The last were released in 1959, but E.M.I. has continued to supply most titles, both mono and stereo. Because of its outstanding stereo recording quality Beethoven's *Fidelio* by Klemperer conducting the Philharmonia Orchestra with Christa Ludwig and Jon Vickers as soloists has just been issued on tape. E.M.I. regards this as a special issue and does not plan to resume issuing new titles at 7 $\frac{1}{2}$  ips on a regular basis.

## Teamwork tapes the train

A RACE against time and the elements to record history in the making was the task faced by Decca recording engineers earlier this month.

The occasion was a "Farewell to Steam" on June 2, when British Railways organised the longest ever excursion run in the history of the railway, and the last non-stop steam run from London to Edinburgh. The train was the "Aberdeen Flyer" headed by *Mallard* the engine which holds the world speed record (125 mph) for steam engines.

Peter Handford, instigator of Transacord, the train-sound recording company, travelled with the 250 train enthusiasts on the trip with a Ferrograph 88 and E.M.I. TR52; A.K.G. microphones and a Vortexion Vibrator, to make 7 $\frac{1}{2}$  ips stereo recordings of the journey.

Many of his recordings have been issued on the Argo label, and Mr. Harley Usill of Argo decided to supplement Mr. Handford's equipment with a track-side unit. His parent company, Decca, supplied one of their studio units. This comprised Ampex recorders running at 15 ips, an E.M.I. RE321 battery portable, plus transistor monitors modified by Decca. Their microphones were A.K.G. D 19's.

The problem of how to record the train's departure from King's Cross and its arrival in Aberdeen ten hours later with only one recording unit, was solved by Decca Navigator Co., who laid on one of their demonstration planes to fly the unit north.

The ex-Spitfire pilot was provided with an exact running schedule of the "Aberdeen Flyer" and from this worked out a series of 'interceptions' based on various departure times from Biggin Hill. These allowed the Argo unit to strip down their equipment at King's Cross and cross London to the aerodrome.

After some heart-in-the-mouth traffic stoppages, the unit was finally airborne. With the aid of the Decca Navigator system they eventually spotted the train on schedule just north of Darlington. The plane then made three runs over

*Mallard* for the benefit of a BBC *What's New* cameraman who had asked for a seat on the plane.

The Argo unit arrived in Aberdeen well before the train only to find that the power supply was DC current. They brought into use their rotary convertor designed to meet such contingencies and the arrival, though marred by the train driver's over-enthusiasm with his whistle opposite the microphones, was fairly successful.

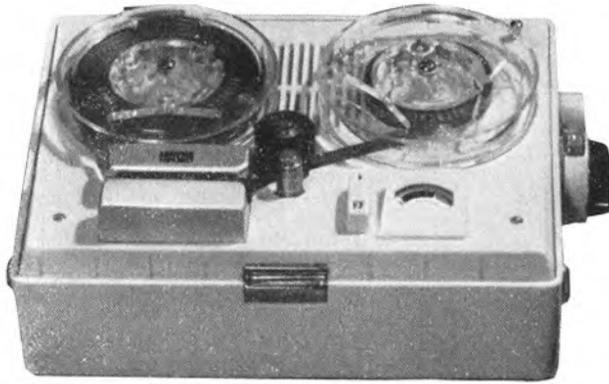
The return journey down the west coast provided Peter Handford with some of the best train sounds he has yet recorded, and a long-playing disc record of the "Aberdeen Flyer" will now become part of the Argo/Transacord series. They will be released later this year in both mono and stereo versions.

Details of their earlier releases are available from Argo Record Company Limited, 113, Fulham Road, London, S.W.3.



The Argo unit recording at King's Cross

# PORTABLES on PARADE



Hitachi TRQ-370

**O**F all the developments that have taken place in domestic recording equipment during the past five years none has been more startling than the emergence of the domestic battery portable machine.

Such lightweight portable recorders operating from their own, self contained power supply as were available five years ago were almost exclusively owned and operated by professional recording engineers. It was most unusual to find such a piece of equipment in the hands of the amateur. Today, however, the picture is completely reversed and the professional user is definitely in the minority.

Never was the phrase "prices to suit all pockets" more true than when applied to these machines, in fact, the choice of equipment available is as comprehensive as the range of its prices which vary from about £12 to very nearly £300. The chief difficulty with which any purchaser is likely to be confronted is now one of decision as to which machine to buy.



Aiwa TP-30

A favourite question which has been put to me many, many times is "Which is the best battery machine?" There is no answer to this poser, any more than there is for those searching for the "best" car or the "best" camera. Some battery machines do some jobs better than others and all machines can do no more than compromise in different ways. The right machine for the individual depends entirely upon individual requirements.



Butoba MT7

Price is obviously a factor that everyone will wish to take into account. Apart from this there are a number of other equally important considerations. In my opinion a battery portable machine should be in every sense truly portable; I want a piece of equipment I can, if necessary, carry for hours across rough and difficult country without too much of a strain. Others, less energetic, might



Dokorder PT-4K

perhaps be content to transport their machines by car, then physically carry them only a few hundred yards. Their

**S**INCE we first published a survey on battery portable tape recorders some five years ago, the situation has been transformed out of all recognition. At that time the cheapest available battery recorder cost over £80, and it was one of only two then available.

Now there is a wide and exciting range to choose from, as the details on pages 20 and 21 of this survey will show. There are popular models costing well under £30, there are a number of high-performance machines between

choice of available machines is very much wider than mine.

Competition in this market has been so fierce that today we are offered a number of transistorised battery operated portables that provide virtually the same performance as mains operated equipment. Among their features are all the facilities of a standard recorder, fast wind forward and back, a reasonable quality built-in loudspeaker and a tone control system. Some of these are very economical to operate, even on their dry cells. The intention of the manufacturers is that they will be



E.M.I. RE321

used at home in place of standard equipment having, as an additional convenience, independence of mains power supply. Others can be fitted with a mains adaptor unit at an extra cost.

What are the proper uses of a battery machine? The professional will tell you that he only uses a battery machine under those conditions where it would not be possible to make use of mains equipment. The basis of this principle is that standard equipment will invariably give a better quality recording than the smaller portable version. Even some amateurs

# PORTABLES on PARADE

£40 and £70, and there are some superb professional quality recorders at higher prices.

In this article DENYS KILLICK takes a look at some of the models currently available and provides a guide as to what to look for when selecting machines. Elsewhere in the survey S. M. WHEATLEY writes about the series of Emiguides concerned with outdoor recording; and another correspondent pens the back-stage story of the fabulous Nagra IIB recorder.

will go to the lengths of running their mains machines from 12 volt converters fed by motor car batteries in order to adapt them for outdoor use, thus preserving the maximum quality in their recordings.

It would seem at first glance that the designers of battery operated machines intended to replace mains equipment are misguided in their endeavours to do what is apparently the impossible. This is not necessarily so, however. Although their standards of quality may fall short of the demands of the purist, battery portables are often sufficiently good to satisfy even a discriminating domestic user.

When the professional is out recording in the field he uses clean, virgin tape, and is not in the least concerned about playback facilities. As a result most of the purely professional-type machines have either no playback facility or it is present only to a limited degree. They are regarded purely as recording instruments and the tapes they produce are taken back to the studio or base for subsequent reproduction on standard equipment. Typical is the E.M.I. British made



**Executive Model 600**

RE321. This is the latest version of the world-famous L2 recorder, operating now on a transistorised circuit and having its own built-in monitoring loudspeaker.

The original L2 had no audio out-

**Stuzzi Magnette**

put at all and even this latest model still dispenses entirely with the erase head so it is essential to use only clean tape on the machine. A separate replay head and amplifier enables the recording to be properly monitored in the field and a quoted frequency response of 60-10,000 cps is achieved at the single tape speed of 7½ ips. The price, as might be expected, is relatively high, £124, but my own reservations regarding this machine is that the physical weight is 17½ lb. I feel



**Fi-Cord 202**

it should be regarded as transportable rather than portable.

Also in this class of professional equipment are the Nagra, selling at just under £300, offering first-class recording facilities on spools up to seven inches in diameter, and weighing about 20 lb.; and a newcomer to the field, the Sony 1.E.M. This latter machine, manufactured by the famous Sony Corporation of Japan, records full track at 7½ ips and accepts spools up to five inches in diameter.

Its most unusual feature lies in the tape transport system which is driven by a clock-work spring mechanism. At the time of writing full details of this machine's performance are not available, but the manufacturers themselves state that the motor has a running time of four minutes only on one wind. Having handled one of the



two machines at present in this country I can say I was most impressed with the high engineering standards of its construction and it doubtless has many specialised applications warranting the outlay of its purchase price, £208 19s. It weighs 11 lb.

The three machines so far mentioned, are in the highest price bracket, but they all have their limitations so far as amateur use is concerned. The solution to the problem. "What machine shall I buy?" does not lie in merely acquiring the most expensive available.

The Philips EL3585 battery portable recorder is a most interesting machine at the other end of the price scale, selling at 24 guineas. Running at a single speed of 1½ ips it does produce



**Grundig TK1**

some surprisingly good recordings and the playback quality through its own built-in loudspeaker is remarkably good. A carrying case is really necessary before seriously using the machine out of doors. The six U2

*(Continued on page 16)*

# PORTABLES ON PARADE

(Continued from page 15)

batteries can be replaced by a mains supply unit at an extra cost of five guineas, if required. Easy to operate and light in weight, I would regard this as being an excellent machine in those cases where price is of more importance than quality.

Grundig offer their TK1 at 29 guineas. This records at 3½ ips thus obtaining a slightly more extended frequency response than the Philips model. If I had to choose between



Midgetape 400

these two machines I would be more influenced by ease of operation and listening tests carried out with the two machines side by side rather than the quoted figures in the respective manufacturers' specifications.

There are a large number of machines available within the price range £40 to £70; one of the newest is the Loewe Opta Optacord 412 at 45 guineas, first produced in Germany in October and only available in this country since the beginning of the year:

Accepting 4½-inch diameter spools and recording at a tape speed of 3½ ips the manufacturers claim a frequency response of 50-12,000 cps. Attractively styled as a flat case with carrying handle it weighs 9½ lb., and



Miny 401

is designed for either battery or mains operation without the need of purchasing an additional mains unit. Playback through its own built-in loudspeaker does reveal a surprisingly wide tonal range and the over-all operation of the machine appears to be quiet and efficient. The distributors did tell me that in aircraft tests the machine had been subjected to forces of up to 3g without having any effect whatsoever on either the tape transport or electronics circuitry. Anyone requiring a machine of rather better



Nagra III B

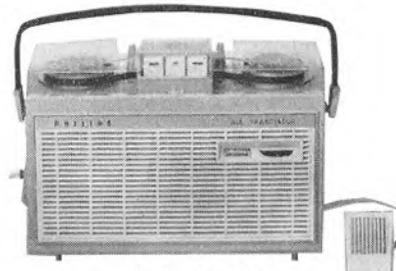
quality would be well advised to investigate the possibilities of this model.

At a higher price still we come to the Butoba MT5, accepting five-inch spools and having two recording speeds, 1½ and 3½ ips. At the higher

speed the frequency range is quoted as 50-13,000 cps, and at 1½ ips as 60-5,000 cps. The owner of a Butoba does indeed have all the advantages and facilities that might be expected to be found on a modern, mains operated machine of good quality, but the physical weight goes up to 12 lb.

For quiet efficiency in operation this machine is probably unbeatable, and it does have the added advantage that a mains adaptor can be bought as an accessory in order to conserve the batteries. I like the quality of its recordings, its playback amplifier and loudspeaker, and the push-button operated deck. I am not so keen on having a tone control operating during recording, neither do I like its bulk or its weight but that is simply because I am looking for extreme portability.

This brings me to the Fi-Cord IA, a machine about the same price as the Butoba, but very much smaller and lighter. Once we return to miniaturisation it immediately becomes apparent that something must be sacrificed. In this case, although paying as much money as for the last machine, there is no fast wind facility



Philips EL3585

in the true sense of the words, and although a playback facility is included it is intended only for monitoring purposes rather than entertainment value; owing to smallness in size the spools shrink to 3¼ inches in diameter.

The machine operates at two speeds, 7½ and 1½ ips. A frequency response of up to 12,000 cps is claimed at the faster speed. It should specially be noted that this description applies only to the Fi-Cord IA, a machine which I'm sorry to say is now no longer in production having been replaced by

**VENNER**  
14 DAY  
CLOCKWORK  
TIME SWITCHES  
IDEAL FOR TAPE  
RECORDERS  
**29/6** P & P  
3/-

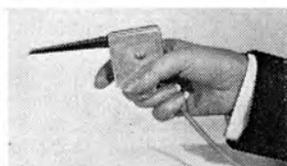
AUTOMATIC CONTROL over radio and/or tape recorder. Will switch ON/OFF or OFF/ON once every 24 hours at any manually pre-set time. Minimum time lapse 30 minutes. It has a current rating of 1 amp sufficient to carry radio and/or tape recorder. Complete with key and mounting bracket. Used but in perfect condition. Fully guaranteed.

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THE WAL D-MAG, head demagnetiser, long nylon covered probes £2 10s. 0d. WAL GAIN transistorised pre-amplifiers, Mono £5, Stereo £7 10s. and Hi-Gain (latter CCIR equalised) - £7 16s. THE WAL BULK Eraser - £7 18s. 6d. Available from all leading dealers. (Wholesale include T.D. & B. London, and A. C. Farnell, Leeds).

**WELLINGTON ACOUSTIC**

**LABORATORIES LTD., Farnham, Surrey (Fnhm 6461)**



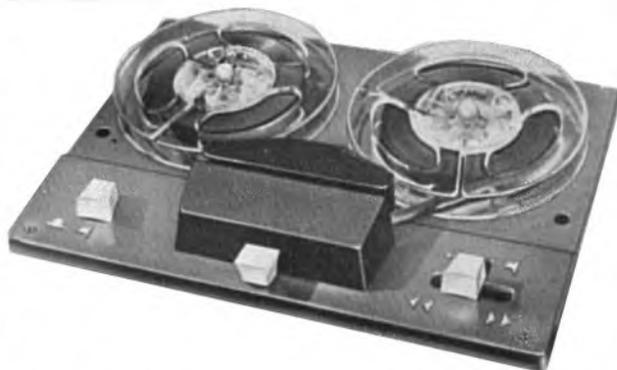
## New deck for battery portables

A NEW tape deck, designed for use with battery portable tape recorders, is announced by B.S.R., manufacturers of the popular Monardeck.

Their new unit employs two speeds,  $3\frac{1}{2}$  and  $1\frac{1}{2}$  ips. Accommodating four-inch spools, it provides a playing time of 32 minutes per track using standard play tape (450 ft.). Rewind is achieved within two minutes. Wow and flutter figures are given as 0.2 and 0.3 per cent rms respectively.

The top-plate of the new TD4 deck measures  $8\frac{1}{2}$  x  $6\frac{1}{2}$  inches. The depth below the mainplate is  $2\frac{1}{4}$  inches, and above is  $1\frac{1}{4}$  inches. The cut-out size is  $8\frac{1}{2}$  x  $5\frac{1}{2}$  inches.

Birmingham Sound Reproducers Ltd., Powke Lane, Old Mill, Cradley Heath, Staffordshire.



the new Fi-Cord 202. The 202 does have fast wind facilities in both directions together with a number of other refinements, but as a result has had to be completely restyled and it is now bigger and heavier than the 1A. It is sad to hear of the demise of the 1A. In my opinion it was one of the finest battery portable machines of its kind ever made, combining high quality recording with extreme ease of use; its weight was no more than  $4\frac{1}{2}$  lb. But it must be borne in mind that it really could be included in the professional

The models I have selected to discuss here have been chosen simply because they are representative of machines of their kind; I have not had the space or time to refer to others which may be taken as being at least as good value for money. It cannot be stressed too strongly the importance of knowing exactly what kind of recordings are going to be made before deciding which is the best machine to use. Ownership of existing mains equipment and private transport facilities will influence the final decision.

Since the basic use of the battery portable tape recorder is to take live recordings in the field it necessarily

follows that having once acquired a machine the quality of the resulting recordings can only be improved by improving the quality or suitability of the microphone. A discussion of different types of microphones is outside the scope of this article but as a last word I should like to offer this thought. If a portable machine is bought with the intention of using it for serious recording work then not only must the impedance at the microphone input fall within one of the



Sony EM1

class being primarily a recording instrument, not intended for playback. Its successor, the 202, accepts spools four inches in diameter, records at  $3\frac{1}{2}$  and  $7\frac{1}{2}$  ips, and can be operated from an accessory mains adaptor unit. The 1A certainly had its faults (there's no such thing as the perfect battery recorder!) but the 202 will have to be very good indeed to warrant its additional weight and bulk. I shall be saying more about the practical uses of this new machine in some of my future Special Assignment articles.



Steelman Transitate



Uher 4000 "Report"

generally accepted standards, but the plug and socket connection used should also be of a standard type and sufficiently robust to permit interchangeability of microphones and leads.

The ownership of the equipment I have described can open up entirely new horizons for the enthusiast; there's nothing more thrilling or exciting than securing good quality actuality recordings out in the open air under difficult conditions.

FOR  
BEST RESULTS  
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**ferrania**

MAGNETIC  
RECORDING  
TAPE



NEW  
**FI-CORD**  
**202**

**PORTABLE  
 BATTERY/MAINS  
 RECORDER**

*so much in so little space*

**The FI-CORD 202 offers all these features:**  
 2 speeds— $7\frac{1}{2}$  and  $3\frac{3}{4}$  • Standard 4" spools •  
 Vu-meter • Fast forward wind • Fast rewind  
 • Resettable counter • Manual and automatic  
 volume control • Built-in loudspeaker • Ex-  
 tension speaker socket • Low and medium  
 input sockets • Socket for remote control •  
 Safety record switch • Easy-load battery cas-  
 settes • Battery warning lamp • Mains input.

FI-CORD 202, the new portable battery/mains  
 high fidelity tape recorder, has been developed  
 after years of exacting tests in the Fi-Cord  
 laboratories. It is a worthy successor to the  
 famed FI-CORD 1A, used internationally by  
 broadcasting companies during recent years.

FI-CORD 202 is for the most exacting profes-  
 sional and equally for the enthusiastic amateur  
 demanding the highest professional stan-  
 dards. It incorporates all the practical advan-  
 tages of a full-size recorder in a small,  
 light-weight machine.

FI-CORD 202 gives you high fidelity recording at  
 your fingertips—whenever you wish, wherever  
 you go.

**AND the FI-CORD 202 weighs only  $6\frac{1}{2}$  lb,**  
**measures  $9" \times 6\frac{1}{2}" \times 4\frac{1}{2}"$ .**



**Price: 66 guineas,** including long life mercury  
 batteries and tape.

**ACCESSORIES INCLUDE:**  
 Carrying case, choice of microphones, power  
 packs for mains and car.

Write for fully illustrated brochure and address  
 of nearest stockist to:

**FI-CORD INTERNATIONAL**  
 40a Dover Street, London W1. HYDe Park 3448

# The man who makes the Nagra

UNIQUE among the many tape recording factories of Europe, which extend from the mammoth plants such as Philips in Holland and Grundig in Germany to some of the little back shop operations of Britain, is the neat, modern four-storey building of the firm of Kudelski, in Switzerland.

Nestling in the foothills beneath the vineyards and but a few hundred yards from the shore of Lake Geneva, the firm of Kudelski operates in a clean building overlooking the broad expanse of the lake and the snow-covered Alps beyond, along the French shore. The firm is but a few minutes' bus ride east of the resort town of Lausanne in the little village of Paudex.

The success of this company is a tribute to the ingenuity and devotion of a young Polish refugee and his determination to make no sacrifices to popular

demand, nor fall short of perfection in the engineering and reproduction of his product.

Stepan Kudelski fled Poland with his family as the German army overran their country. They came to France but soon had to move on again as the Germans advanced into this country also. Finally, they took refuge in Switzerland.

Here the boy studied electronics until, in 1952, on a site not far from the present factory, he set up business.

Since then, he has been experimenting, manufacturing and designing electronic equipment of every type. But his most impressive success to date is his Nagra tape recorder, a small, light but compact portable, which can be operated by its own power or from the mains and which has satisfied the highest standards of broadcasting and recording techniques.

Working with a staff of seventy, Kudelski is now turning out about a hundred Mark III Nagras a month; but this is nothing like the figure demanded.

The manufacture of these instruments is unique in many directions. Much of it is done on a part-time basis by local inhabitants of the village, or the wives and relatives of full-time employees—at home. They take the necessary parts, transistors, etc., from the factory and are able to make their pocket money without having to leave their children.

In order to meet the demands of professional machines and yet produce something which was portable and light, great care had to be observed in its design. The proposed recorder was constructed for recording companies and broadcasting stations wishing to record events in the field without a lot of heavy equipment. The running had to be silent and speed absolutely stable, and excessive size or weight would render the machine impracticable.

After much experimentation, Nagra III emerged.

Instead of using the conventional high-speed motor controlled by a centrifugal governor and transmitting movement to a capstan by some form of friction, the recorder uses a low-speed electrodynamic motor, stabilised by a servo-amplifier.

This recorder is not for the mere amateur. First of all because of the usual long delay in obtaining supplies and also because of its high cost. In Britain, the price is over £250 without batteries or microphones.

Many well-known organisations own these machines, including UNO, UNESCO, and the World Health Organisation, along with every important broadcasting system from the BBC to the Yugoslav stations. And the manufacturers proudly list as private owners such varied individuals as Billy Graham, Prince Rainier, Yul Brynner and Benny Goodman.

The Nagra is not the only electronic instrument produced by this Swiss company. Mr. Kudelski is experimenting now with a six-track recorder for the manufacture of stereo gramophone records; and not the least interesting of his products is the HR3A micro transmitter which is no larger than a packet of cigarettes but can transmit a signal as far as 100 yards when used under unfavourable conditions, such as in a city, or up to six miles under favourable conditions in open country.

One of the uses for which this is designed is in film production or open-air theatrical performances. An actor can carry a lapel microphone and the signal from this transmitter, and those of other artists, can be fed into a mixer and then to a common amplifying and loud-speaker system or a tape recorder.

*Jim Wheatley's*

## BATTERY RECORDER NOTEBOOK



JOHN BORWICK'S new *Emiguide* on outdoor recording gives a very good idea of what quality should be expected in the use of battery portable tape recorders. His advice is gained from first-hand experiences, and I would like to devote my column this month to discussing some of the points raised.

Even in this professional recording, I thought that the seaside sequence could have had just that little extra to put the listener clearly in the picture. The sound of the waves and the general hub-hub of the crowd on the beach could be a little uncertain to the casual listener.

To capture this sort of atmosphere for production sequence it would perhaps be best to record the general noises first, then record a 'close-up' of the waves. Without switching off, move closer to the inevitable group of children, and record their excited cries and talk about the sand-castle they are building, or, from the quieter ones exploring a pool for crabs and shrimps, the shout of joy or fear as they make a capture. The recording will thus be doubly useful, and you have left no doubt in the listener's mind regarding the location.

John's football crowd sequence sug-

gests making a commentary over the crowd sounds. If you are doing this, remember you must adopt a close-microphone technique. Turn down the gain control so that the crowd noises do not drown your own voice, and hold the microphone close to your mouth and a bit to one side. Speak across it. This avoids those spluttering sibilants. Use a normal voice with plenty of expression to compare with the ebb and flow of the game. If an exciting run-up and brilliant goal causes you to raise your voice too, the event will excuse a bit of distortion at the climax. Incidentally, Denys Killick tackled this particular problem in one of his Special Assignments (*November 16, 1960 issue*).

In the zoo and early morning bird choruses items, the problem of using a mains machine was discussed. One question asked was which should be extended, the mains or microphone lead. A warning regarding this included sensible advice on the use of only high-class tough rubber cable if the mains lead is lengthened, and of avoiding the use of makeshift twisted wires covered with insulating tape. He also advised against using domestic plugs and sockets. These would end up being laid on the ground or damp grass.

My own advice is that if the mains lead must be extended into the open air,

(Continued on page 34)

# BATTERY PORTABLE ROUND-UP

Name of Recorder and Manufacturer's Address	Speeds and Number of Tracks	Frequency Response	Signal-to-Noise Ratio	Wow and Flutter	Power Output	Weight (lbs.)	Size (inches)	Max. Spool Size (inches)	Speaker Size (inches)	Microphone if included in Price	Battery Life	Power Supply	Other Features and Facilities	Price
<b>AIWA TP-30</b> Coneans Ltd., 26, High Street, Wimbledon Common, S.W.9	Rim-driven 7½ ips approx. (2 tracks)	—	—	—	100 mW	2½	9×5½×2½	3	2½	Crystal	8 hours	Ever-Ready U11; Vidor V0011; two Ray-O-Vac 1 LP's 9v Vidormax T6003; or one Ever-Ready PPS	Two small motors for record/playback and rewind; four transistor push-pull amplifier; instant brake system.	£14 14 0 including 300ft. l.p. tape, earphones, batteries, carrying strap.
<b>BUTOBA MT5</b> Denham & Morley Ltd., 175, Cleveland Street, London, W.1.	3½, 1½ ips (2 tracks)	50-13,000 and 60-5,000	40dB	0.11% and 0.16%	1.2 watts	12	12×9×6	5	7×5	—	100 hrs.	Eight U2 cells or AC mains; or 6V battery.	Straight-through amplifier; head-phone or magic eye monitoring; oscillator erase; tape counter clock can be synchronised with cine projector; high and low impedance inputs; two outputs at 100mV; tone control; two motors.	£69 6 0
<b>BUTOBA MT5 "S"</b>	3½, 1½ ips (2 tracks)	50-13,000 and 60-5,000	40dB	0.11% and 0.16%	8 watts—Type 31; 18 watts—Type 32	12	12×9×6	5	7×5	—	100 hrs.	Eight U2 cells or AC mains or 6V battery.	As MT5 plus re-movable power amplifier stage fitted in battery compartment; and mixing.	£86 2 0
<b>BUTOBA MT7</b>	3½, 1½ ips (2 tracks)	100-12,000 and 100-5,000	40dB	Better than 0.5%	1 watt	7	12×8½×3½	3	6×3½	Moving coil MS2	12 hours	Four U2 cells or AC mains or 6V battery or rechargeable battery.	Two inputs; one output; Fast forward and rewind.	£46 4 0
<b>DOKORDER PT-4K</b> Samuel Lewis (City) Ltd., 200a, Upper Thames Street, London, E.C.4.	3½, 1½ (2 tracks)	200-7,000 cps 200-3,500 cps	—	0.7%	120mW	3	7½×3½×2½	3½	2½	Dynamic 10KOhm with Stop/Start Switch	8 hours (Cont.) 3 months Intermit.	Five 1½V Dry Cells Ever-Ready U-7	Six transistors; printed circuit; record/replay-erase; recording level and battery indicator.	£51 9 0 (including accessories)
<b>E.M.L. Model RE.321</b> E.M.L., Hayes, Middlesex.	7½ (Full track)	60-10,000 cps (CCIR)	44dB un-weighted	0.25% (r m s)	600 ohm Zero level	17½	14½×7½×8½	5	3	—	1½/2 hrs. approx.	Eight 1½v standard torch cells.	Fully transistorised. Low impedance (30/50 ohm) Microphone input.	£124 0 0
<b>EXECUTIVE Model 600</b> Finex (Overseas) Ltd., 7, West End Lane, Kilburn Bridge, London, N.W.6	3½, 1½ ips (2 tracks)	200-4,000 cps	35dB (at 1,000 cps)	Better than 0.45%	180mW	5.3 (inc. accessories)	9×5×2½	3	2½	Crystal	10 hrs.	Twelve Ever-Ready D14 for motor (6) and amplifier (6)	One motor; meter recording level indicator; headphone monitoring; mains converter available; remote-control microphone; or foot operation; telephone pick-up.	£15 15 0
<b>FI-CORD 202</b> Fi-Cord International Ltd., 40a, Dover Street, London, W.1.	7½, 3½ ips (2 tracks)	50-12,000 and 50-8,000 both ±3dB	—	0.3% at 7½ ips 0.4% at 3½ ips (RMS)	180mW	6½	9×6½×4½	4	3 (20 ohms)	—	20 at 7½, 30 at 3½ ips E'tronic batteries 60 hrs. either speed	Mercury cells	Battery and mains operation	£69 6 0
<b>GRUNDIG TK1</b> Grundig (Great Britain) Ltd., 40, Neulands Park Road, Sudeham, London, S.E.26.	3½ (2 tracks)	80-8,000 c/s ±3dB	40dB	—	250mW	8	12×7×4½	3	4	GML (dynamic)	20 hrs. at 2 hrs. per day approx.	Four 1½v Ray-O-Vac 3LP (Motor) and two 1½v Ray-O-Vac ILP (Amp.)	Magic Eye (DM71) recording level control; monitoring; separate vol/tone controls; Lockable temp/stop. Record safety button; two-pole socket allowing connection for external (6v/12v) motor supply.	£30 9 0 (including microphone and batteries).
<b>HITACHI TRQ-370</b> Les Products (G.B.) Ltd., 10-18, Clifton Street, London, E.C.2.	3½, 1½ (2 tracks)	150-6,500 cps and 150-3,000 cps	—	—	500mW	4½ inc. batteries	8×6×3½	3	2½	dynamic	—	Four 1½v flashlight cells	Recording level meter and battery level indicator control. Remote control; leather carrying case; back-spacing facilities—	£54 12 0

# BATTERY PORTABLE ROUND-UP

Name of Recorder and Manufacturer's Address	Speeds and Number of Tracks	Frequency Response	Signal-to-Noise Ratio	Wow and Flutter	Power Output	Weight (lbs.)	Size (inches)	Max. Spool Size (inches)	Speaker Size (inches)	Microphone if included in Price	Battery Life	Power Supply	Other Features and Facilities	Price
<b>MIDGETAPE CHIEF 400</b> Thomas A. Edison Ltd., Victoria House, Southampton Row, London, W.C.1.	1½ (2 tracks)	150 to 5,000 cps	42dB	Less than 0.7%	10mW at 200 ohms	3	8½×3½×1½	2½	2	Dynamic	50	One Mercury Battery	—	£129 0 0
<b>MIDGETAPE CHIEF 500</b>	3½ (2 tracks)	50-10,000 cps ±5dB	48dB	0.4%	10mW at 2,000 ohms	3	8½×3½×1½	2½	—	Dynamic—desk type	50	One Mercury Battery	Visual volume indicator.	£160 0 0
<b>MINY Model 401</b> L.P.R. Ltd., 28, Curzon Street, London, W.1.	Approx. 3½ ips Rim drive (2 tracks)	200-6,000	—	—	150mW	3	8×7½×2½	3½	2½	Crystal	50 hrs. (motor) 100 hrs. amplifier	Six Ever-Ready D14 or U7 plus three U11	Two motors; ear-phone monitoring; pause control; power rewind; speed adjustment.	£16 5 6
<b>NAGRA III B</b> Livingstone Laboratories Ltd., 31, Camden Road, London, N.W.1.	15, 7½, 3½ (Full track)	30-15,000 cps ±1dB at 15ips	52dB	0.15% P.P.	Line O/P 1.55v at 100 ohms	Approx. 15lbs.	12½×8½×4½	7 cover open	3 Monitor Speaker	—	20 hrs. normal batts. 70 hrs. with alkaline batts.	Twelve 1½v flashlight batteries	Automatic level control facility; mixing inputs; recording level meter; remote control facilities.	£307 0 0
<b>OPTACORD 412</b> Highgate Acoustics, 71-73, Great Portland Street, London, W.1.	3½ (2 tracks)	50-12,000 cps	46dB	—	1	9½	14½×9×4	4½	6×3½	—	—	Five 1½v U2 cells or AC mains 110/220v	Push-button control; powered rewind; position indicator; two inputs; magic eye recording level indicator; pause control; tone control.	£47 5 0
<b>PHILIPS EL3585</b> Philips Electrical Ltd., Century House, Shaftesbury Avenue, London, W.C.2.	1½ips (2 tracks)	120-5,500 cps ±3dB	—40dB	0.5%	250mW	8	11½×3½×7½	3 (4 with lid removed)	4 round	Moving-coil cardioid	20	Six 1½v U2 or equivalent	Push-button control; removable transparent dust cover; recording level indicator and battery life meter combined; safety interlock; three inputs; extension speaker socket; fast rewind; detachable carrying handle.	£25 4 0
<b>SONY IEM</b> Tellux Ltd., 44, Brunel Road, London, W.3.	7½ (Full track)	100-5,000 cps ±5dB (CCIR)	50dB	Less than 0.1%	—	13½	13×6½×4½	5	—	—	—	Six 1½v Penlight cells	Spring motor. Automatically twists tapes after recording to distinguish from unrecorded tapes.	£208 19 0
<b>STEELMAN TRANSITAPE</b> Redifon Ltd., Broomhill Road, Wandsworth, London, S.W.18.	1½, 3½ (2 tracks)	100-6,000 cps ±3dB	—	.5%	100mW	6½	9½×6½×3	3	4	Crystal	50	13	Rechargeable cells may be filled.	£25 £29 0 0
<b>STELLA ST470</b> Stella Radio & Television Co. Ltd., Astra House, 121-123, Shaftesbury Avenue, London, W.C.2.	1½ips (2 tracks)	120-5,500 cps ±3dB	—40dB	0.5%	250mW	8	12×4½×7½	3 (4 with lid removed)	4 round	Moving-coil cardioid	20	Six 1½v U2 or equivalent	Push-button control; removable transparent dust cover; recording level indicator and battery life meter combined; safety interlock; three inputs; extension speaker socket; fast rewind; detachable carrying handle.	£2 £26 5 0
<b>STUZZI MAGNETTE</b> Recording Devices Ltd., 44, Southern Row, Kensington, London, W.10.	3½, 1½ (2 tracks)	50-5,000 and 40-9,000	50dB	.25% (rms)	600mW	8	11×4½×8	4	4	Dynamic	Average 50 hrs.	Four 1½v torch batteries	Counter; pause control; battery indicator; push-buttons; straight through monitor on phones, etc.	£ £61 19 0
<b>STUZZI MAGNETTE STUDIO</b>	7½ and 3½ (2 tracks)	40-14,500 at 7½	50dB	.2%	600mW	8	11×4½×8	4	4	Dynamic	Motor 20 hrs. Amp; 50 hrs.	Four 1½v torch batteries	Counter; pause control; battery life indicator; push-buttons; straight-through monitoring on head-phones. For speech only; Numbered special tape; automatic vol. control; remote control; 1 hr. recording time.	£ £78 15 0
<b>STUZZI MEMOCORD</b>	1.3 average (4 tracks)	400-4,000	—	—	20mW	11oz.	4½×3½×1½	Special	Special	Built in	20 hrs. approx.	1 PP3 1 D15	For speech only; Numbered special tape; automatic vol. control; remote control; 1 hr. recording time.	£ £26 5 0
<b>UHER 4000</b> Bosch Ltd., 205, Great Portland Street, London, W.1.	7½, 3½, 1½, 15/16ths ips (2 tracks)	50-22,000cps ±3dB at 7½ips 70-5,000cps ±3dB at 15/16ths ips	50dB	±0.15% at 7½ips	1	6	11×8×3	5	4×3½	Dynamic (70-14,000 cps with remote control)	Four U2 intermittent 12 operation.	Dry fit rechargeable batteries	Push-button control; fast rewind; monitoring; tone control; separate volume and modulation control; low impedance input; metal cabinet; accumulator rechargeable from 6, 12 or 24v car battery.	£97 13 0

**I**N this design provision is made for separate record and playback amplifiers and the design includes a transistor erase circuit using a ferrite head for high efficiency. Equalisation is to C.C.I.R. standards and is correct on playback at a tape speed of  $7\frac{1}{2}$  ips. Using the specified playback head, the frequency response (measured from a C.C.I.R. test tape) is 3 dB down at 55 cps and at 8,500 cps. The class B output stage is designed to give a maximum output of one watt.

#### REPLAY AMPLIFIER

The output voltage from the playback head should be directly proportional to the frequency of the signal recorded on the tape, provided that this has been recorded at a constant level of magnetisation. In practice there is a fall in output at the high frequency end of the audio spectrum due to hysteresis and eddy current losses in the core of the playback head. Hysteresis losses can be reduced by a suitable choice of core material but eddy current losses have to be reduced by using thinner core laminations. Mechanical difficulties limit the amount by which the thickness can be reduced.

A further high frequency attenuation arises from the finite length of the air gap in the playback head; the magnetic field in the tape then tends to by-pass the gap between the poles.

The amount of equalisation at low frequencies is determined by the inductance of the head. The induced e.m.f. is effectively in series with the inductance of the playback head and the input resistance of the transistor amplifier, so that when the reactance of the head is equal to the transistor input resistance the response falls by 3 dB and then in theory continues to fall at the rate of 6 dB/octave above this frequency. Thus, as the e.m.f. from the head is proportional to frequency, equalisation at low and medium frequencies is automatically provided by the head itself.

Additional bass equalisation may be necessary either if the head has a low inductance or if an extended low frequency

# BUILD YOUR OWN TRANSISTORISED TAPE RECORDER

**W**E have published various designs for the do-it-yourself enthusiast who wishes to build his own battery portable tape recorder. In this article "TAPE" once again leads the field by publishing for the first time for amateurs a suggested circuit for a transistorised tape recorder.

In the first half of this two-part feature the replay amplifier is dealt with. Next month we will publish the components and description of the record amplifier, bias and erase oscillator and provide a design for the erase head and oscillator.

By

**R. H. CHILTON, B.Sc.(Eng.), Grad. I.E.E.**

of

*Standard Telephones and Cables Limited*

response is required. However, it must be remembered that as the optimum noise figure for a transistor depends on a certain value of source resistance (generally about 600  $\Omega$  for a collector current of about 300  $\mu$ A) too high a head impedance would result in a high noise figure at higher frequencies.

Unfortunately the low collector current increases the input resistance of the first stage which necessitates further bass equalisation. The input resistance is in fact lowered to about 2 k $\Omega$  by negative feedback which is applied to the base from the collector through a 470 k $\Omega$  resistor, R1 (see fig. 1). This resistor also improves the d.c. stability of the first stage. With a playback head having an

inductance of 0.9 H, and a transistor stage with an input resistance of 2 k $\Omega$ , the 3 dB point occurs at approximately 300 cps so that if a level response is required at frequencies lower than 300 cps, additional equalisation becomes necessary. In the circuit (fig. 1) this is provided by the 0.25  $\mu$ F capacitor (C3) in series with the 560  $\Omega$  resistor (R3) immediately following the first stage.

Apart from the 6 dB/octave equalisation provided by the head inductance, the characteristic above approximately 3,000 cps is further modified according to the C.C.I.R. specification. The C.C.I.R. characteristic on playback, i.e. the response of the amplifier against frequency (assuming a constant induced e.m.f. on

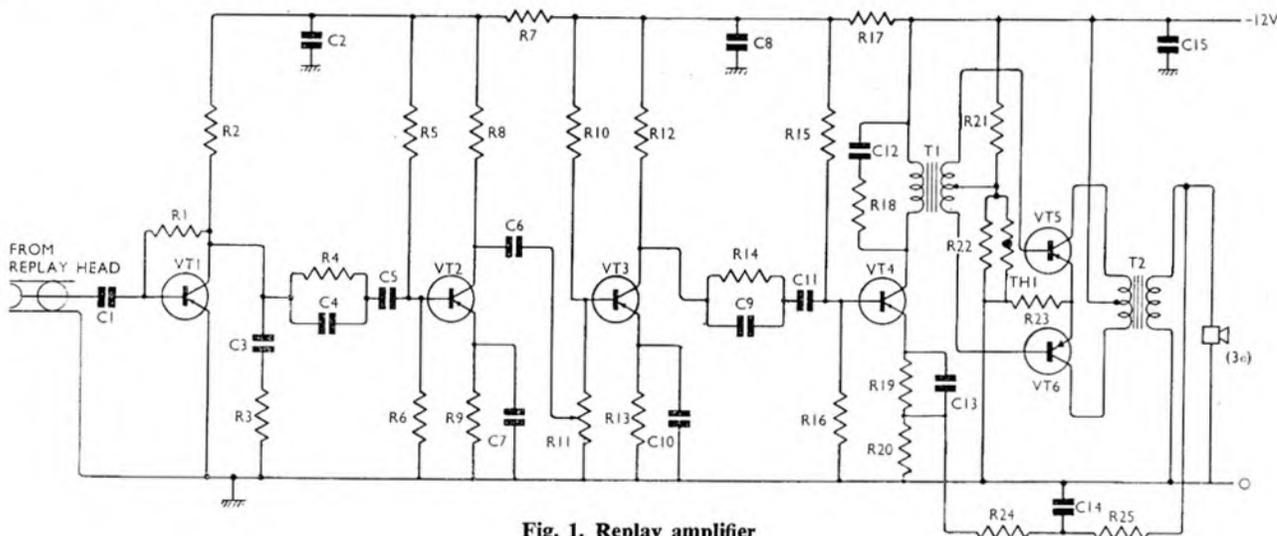


Fig. 1. Replay amplifier

# BUILD YOUR OWN TRANSISTORISED TAPE RECORDER

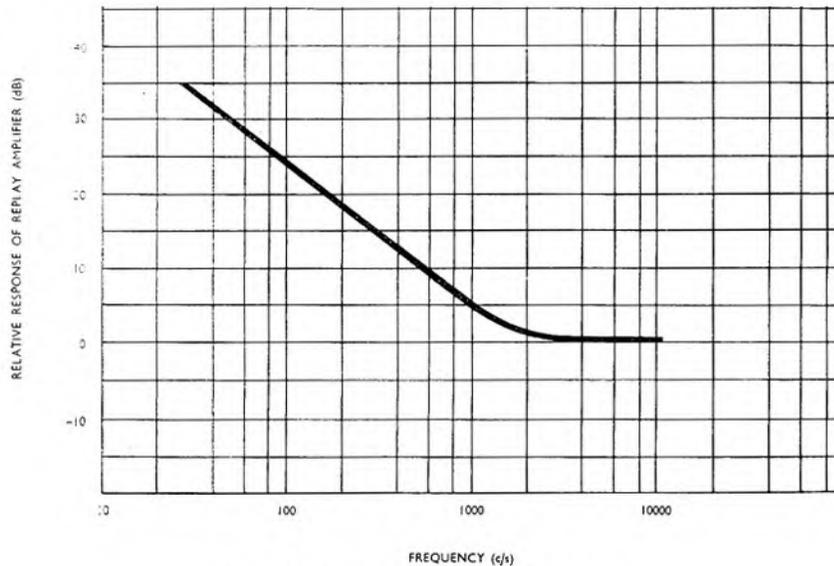


Fig. 2. Ideal CCIR replay characteristic

the playback head) has the same shape as the impedance/frequency characteristic of a series combination of a capacitor and a resistor having a time constant (CR) of 100  $\mu$ s. This is shown in Fig. 2 and applies only to a tape speed of 7½ ips.

The fall in high frequency response mentioned earlier makes it necessary to introduce treble boost. Owing to the rather poor high frequency response of the playback head used it was necessary to apply treble boost to two stages. In the circuit, (Fig. 1) a 15 k $\Omega$  resistor (R4) and a 0.01  $\mu$ F capacitor (C4) are connected in parallel between the first and second stages, and an 18 k $\Omega$  resistor (R14) and a 4,700 pF capacitor (C9) are connected in parallel between the third and fourth stages.

Transformer coupling is used between the driver stage and the class B push-pull

output stage. Negative feedback is applied between the secondary of the output transformer and the emitter side of the driver stage.

Due to the phase shift of the amplifier at the higher frequencies, instability can occur and a phase correcting network consisting of a series combination of a 680  $\Omega$  resistor (R18) and a 0.02  $\mu$ F capacitor (C12) is connected across the primary of the driver transformer. The consequent fall in the high frequency response is corrected by incorporating a treble cut network in the feedback loop.

Using an E.M.I. standard tape (S.R.T. 13) recorded to the C.C.I.R. characteristic at 7½ ips, the frequency response is  $\pm 3$  dB between 55 cps and 8,500 cps at an output level of 200 mW (see Fig. 3). The input to the amplifier at 1,000 cps for full output (1 watt) is 0.4 mV.

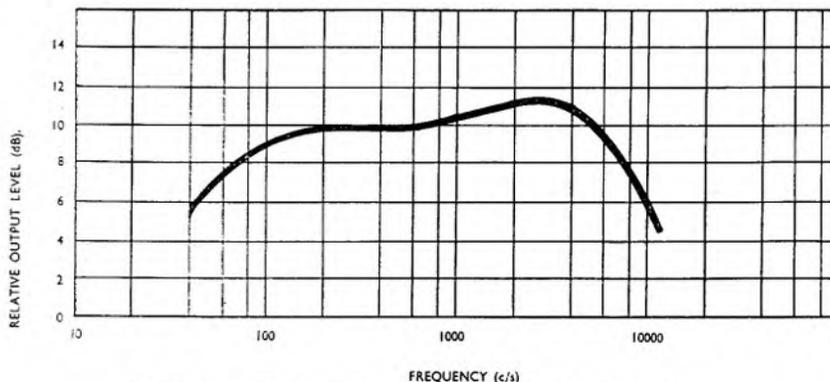


Fig. 3. Overall playback characteristics from CCIR test tape

## COMPONENTS

### Transformers

**DRIVER TRANSFORMER (T1)**  
Primary: 1,500 turns 36 SWG enamelled copper wire.

Secondary: 750 + 750 turns 36 SWG enamelled copper wire, bifilar wound.

Windings placed in this order: ½ primary - secondary - ½ primary.

$L_p = 8.75$  H

$R_p = 95\Omega$

$L_s = 850$  mH each half

$R_s = 48 \Omega$  each half

measured at 200 cps

Laminations: ¾ in. stack of M.E. & A. No. 35 Silcor 17 or Scott No. 120 Stant-ranis B.

### OUTPUT TRANSFORMER (T2)

Primary: 420 + 420 turns 28 SWG enamelled copper wire.

Secondary: 126 turns 22 SWG enamelled copper wire.

$L_p = 176$  mH each half

$R_p = 8 \Omega$  each half

$L_s = 15.5$  mH

$R_s = 0.6 \Omega$

measured at  $\omega = 10^4$

Laminations: ¾ in. stack of M.E. & A. No. 147 Silcor 17 or Scott No. 279 Stant-ranis B.

Resistors (Erie type 9. Tolerance  $\pm 10$  per cent)

R1	470 k $\Omega$	R14	18 k $\Omega$
R2	22 k $\Omega$	R15	4.7 k $\Omega$
R3	560 $\Omega$	R16	3.9 k $\Omega$
R4	15 k $\Omega$	R17	470 $\Omega$
R5	56 k $\Omega$	R18	680 $\Omega$
R6	22 k $\Omega$	R19	1.2 k $\Omega$
R7	2.2 k $\Omega$	R20	33 $\Omega$
R8	4.7 k $\Omega$	R21	2.2 k $\Omega$
R9	3.9 k $\Omega$	R22	68 $\Omega$
R10	56 k $\Omega$	R23	2.2 $\Omega$
R11	10 k $\Omega$ pot.	R24	330 $\Omega$
R12	4.7 k $\Omega$	R25	470 $\Omega$
R13	2.2 k $\Omega$		

### Thermistor

TH1 STC type KS17

### Capacitors

C1	8 $\mu$ F	12 V electrolytic
C2	50 $\mu$ F	25 V electrolytic
C3	0.25 $\mu$ F	
C4	0.01 $\mu$ F	
C5	8 $\mu$ F	12 V electrolytic
C6	8 $\mu$ F	12 V electrolytic
C7	100 $\mu$ F	6 V electrolytic
C8	50 $\mu$ F	25 V electrolytic
C9	4 700 pF	
C10	100 $\mu$ F	6 V electrolytic
C11	8 $\mu$ F	12 V electrolytic
C12	0.02 $\mu$ F	
C13	200 $\mu$ F	6 V electrolytic
C14	0.1 $\mu$ F	
C15	50 $\mu$ F	25 V electrolytic

### Transistors

VT1	STC type	TK45C
VT2	" "	TK42C
VT3	" "	TK40C
VT4	" "	TK42C
VT5	" "	TK40C
VT6	" "	TK40C

Note: VT4, 5 and 6 may be replaced by the STC audio transistor set type TK1002C.

(To be concluded in the next issue)



## H. BURRELL HADDEN EXAMINES AND TESTS TWO OF THE CURRENTLY AVAILABLE BATTERY PORTABLE TAPE RECORDERS

# BUTOBA MT5

**T**HE Butoba MT5 is made in Western Germany by an old established firm, which for many years has produced precision clocks and watches. It is not surprising, therefore, that a tape machine from this experienced source should be so well engineered.

The instrument is attractively styled in a plastic covered wood case and provided with a carrying strap which can be arranged for shoulder or hand carrying. It is perhaps a little on the large side for a battery portable, measuring 9 x 12 x 6 inches, and weighing 12 lbs. complete with batteries. However, when one considers that the tape transport system uses two motors, one to drive the capstan and the other for forward and reverse fast wind, and that a 7 x 5 inch elliptical speaker is included, it will be seen that a great deal has been got into the space.

The MT5 will accommodate five inch reels of tape, giving up to four hours of recording on one reel using double play tape at  $1\frac{1}{2}$  ips, or two hours at  $3\frac{1}{2}$  ips. Operation of the machine is by push buttons. On the machine reviewed these were a little stiff until one got used to them. Five buttons are provided, play, record, forward and reverse wind and off. An unusual feature is the provision of a "quick start" switch which enables the tape to reach immediate full speed. This is an ideal feature which avoids any unpleasant "run up" noises. The same button can also be used as a

pause control. The other two controls are a record/replay volume control and a tone control which operates both on record and playback.

Record level indication is by means of an "exclamation mark" magic-eye type indicator. This is somewhat unusual in operation in that full modulation extinguishes the light rather than bringing it to full brilliance as more common. I found this feature made the indication much more sensitive and easy to use.

Two sockets are provided, one either side of the machine, the left hand one taking the microphone plug and the right hand one a special lead for recording from radio or other high level input. Monitoring is possible by connecting a special headphone set, supplied as an accessory, to whichever socket is not in use for recording. A telephone adaptor is also available. The right-hand socket can also be used for playback through an external amplifier. If under these conditions, the built-in loudspeaker is not needed it can be switched off by setting all the push buttons in the "up" position. A clock type tape position indicator is provided.

The machine as supplied runs off eight  $1\frac{1}{2}$  volt U 2 type dry cells, which are easily accessible in a compartment at the bottom of the machine. Access to them is by means of a coin-slotted screw, the loosening of which enables the whole battery container to be removed.

A mains unit supplied as an accessory can be inserted into the battery compartment in place of the battery container, and this enables the machine to be operated on 110 or 240 volt mains. The mains unit also provides for operation from a 6 volt car battery. The change-over from mains to internal battery operation can be accomplished in a matter of seconds.

The machine was given a number of practical recording tests and it performed

extremely well. Wow and flutter were virtually absent and the quality of reproduction from the internal loudspeaker was very good indeed. This, combined with the high output volume available, made one think that one was listening to a much larger mains operated machine.

On measurement the frequency response was good as can be seen from the curves in the accompanying graph. The manufacturers specification quotes an upper limit of 13,000 cps at  $3\frac{1}{2}$  ips, but gives no tolerance figures, and perhaps in this respect the machine was a little disappointing. However, the smoothness of response over the range to 8,000 cps is very good indeed and accounts for the pleasing reproduction.

Two microphones were supplied with the test machine, one being a small moving coil hand instrument, and the other a much more expensive studio quality table microphone. The hand microphone gave very good results, but it cannot be denied that the studio microphone with its wider smoother frequency response gave far superior reproduction. This bears out the reviewers contention, frequently made in the past, that the microphone supplied with a tape recorder is more often than not the limiting factor so far as the quality obtainable from the recorder is concerned.

This machine can be thoroughly recommended at a basic price of 66 guineas, and perhaps no more need be said than that the reviewer is very sorry to have to part with this very useful kit.

### MANUFACTURER'S SPECIFICATION

Frequency response: 50-13,000 cps at  $3\frac{1}{2}$  ips; 60-5,000 cps at  $1\frac{1}{2}$  ips.

Signal-to-noise ratio: 40 dB.

Power output: 1.2 watts.

Inputs: Microphone, 200 ohms, input voltage 200 mV; Radio, 100 K ohms, radio output 200 ohms, approx. 100 mV.

Transistor line-up: OC 603, OC 75, OC 71, OC 76—2 pcs, two OC 74 two diodes (OA 81—2 pcs) one valve (DN 71—magic line).

Battery line-up: two 4 flashlight cells,  $1\frac{1}{2}$  volts each—6V for motor, and 6V for amplifier.

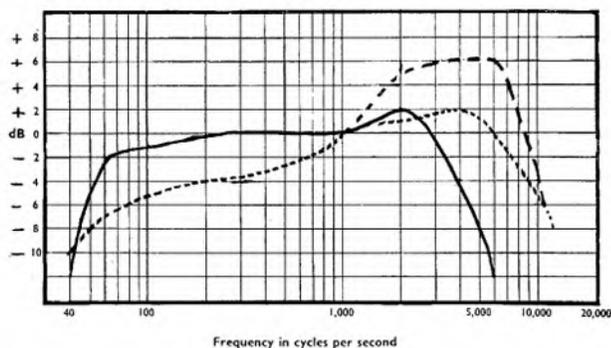
Mains supply: 110—160 V, 50—60 cycles, or car battery (6 volt).

Battery life: 20-40 hours.

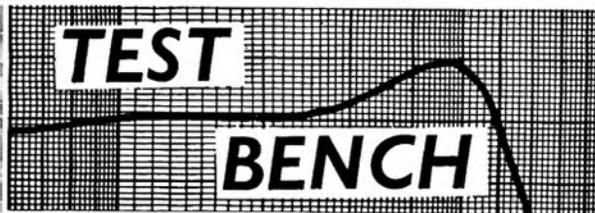
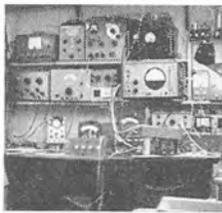
Size: 12 x 6 x  $9\frac{1}{4}$  inches.

Weight: 12 lbs. including batteries.

Distributors: Denham & Morley Ltd., Denmore House, 173, Cleveland Street, London, W.1.



**Replay characteristics of the Butoba MT5.**  
 ——— Record/replay at  $1\frac{1}{2}$  ips  
 - - - - Record/replay at  $3\frac{1}{2}$  ips  
 - · - · Tone control at maximum top at  $3\frac{1}{2}$  ips



# OPTACORD 412

**T**HE Optacord 412, manufactured by Loewe Opta A.G. in Western Germany, is a transistorised, fully portable machine. It will operate either on self-contained dry battery, a 6 volt car battery (12 volt car battery can be used with extra resistance unit), or 110 to 220 volts AC mains.

The machine is attractively styled in almost unbreakable plastic, and its dimensions are 15½ x 9¼ x 4½ inches. It weighs just under 9 lb. Space is provided within the machine for carrying microphone supplied, and also the mains lead, which is kept out of sight during battery operation. On batteries, twenty hours life can be expected, with five U 2 type cells.

The tape machine runs at 3½ ips and will take reels up to 4¼ inches in diameter. This provides a playing time of one hour each 2 x 60 minutes half-track recording on two tracks of a reel of triple-play tape; or 45 minutes on double-play tape. Fast rewind both forwards and backwards is provided.

microphone input, and a pause control which enables the tape to be halted for short periods without stopping the motor. Record level indication is by an "exclamation mark" type of magic eye indicator. A digital type of tape position indicator is provided.

Three sockets are provided at the side of the machine. One of these is for the microphone plug, the second provides for radio input and a low level output to feed a high quality amplifier. For this latter use a lead is provided to connect with German receivers having a special socket for the purpose. The third socket provides for an extension loudspeaker and also with a further special lead, supplied as an extra, for the connection to a six volt car battery supply. If an external speaker is in use the 6 x 3½ inch internal loudspeaker can be disconnected by means of a switch.

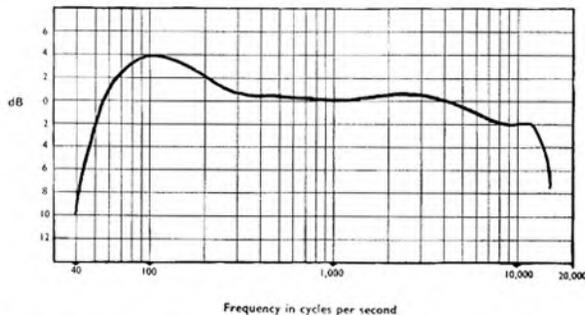
The amplifier is fully transistorised with the exception of the DM71 recording level indicator, and provides

frequency response is as shown on the accompanying graph, and it will be seen that the makers claim of 50-12,000 cps is amply justified.

The makers quote no tolerance for this but with the exception of a very slight rise at 100 cps, this equipment is within ± 2 dB over this range. Wow and flutter were very low for a battery operated machine. The signal-to-noise ratio was approaching 50 dB.

On practical test, using the moving coil microphone supplied, some excellent recordings were made. However, it is only fair to point out that the mechanical noise of the motor was high. The microphone lead did not allow the microphone to be held a sufficient distance away from the machine to prevent the motor noise being recorded, when the wanted sounds were quiet and needed a fair amount of amplifier gain. Of course with louder sound there was little problem from this source.

With the above reservation regarding motor noise, which may have been peculiar to the model tested, I can thoroughly recommend this machine as a good buy at £47 5.



Replay characteristics of the Optacord 412 battery recorder

The controls on the machine are simply arranged. All controls involving starting and stopping the tape at both playing speed and fast speed are of the "piano key" type. These keys also operate the "on/off" switch for the amplifier in the play and record positions.

In order to record it is necessary to press two keys simultaneously, thus providing an effective safeguard against accidental erasure of a valuable tape. The four other controls are of the "thumb wheel" type and are volume control, play back tone control, change over switch for radio or

1 watt output on replay. It is well designed having six transistors, two type AC107, one OC75, and three OC74. The mechanical layout and general construction is of a high standard. Full servicing data are included with the machine, a detail often omitted with domestic tape recorders. In this case one might say they are provided in double measure since the original German leaflets are accompanied by a clear if quaintly literal English translation.

The machine was given the usual technical tests and subjected to a number of practical recording trials. The

## MANUFACTURER'S SPECIFICATION

Frequency response: 50-12,000 at radio output.

Dynamic Range: 46 dB or better.

Rewind speed: Thirty times the regular tape speed.

Power output: One watt, with 7½ volts battery tension and total distortion ten per cent or less.

Loudspeaker: 3½ inch elliptical PM dynamic.

Outputs: Extension loudspeaker (5 ohms, moving coil impedance).

Valve line-up: Six transistors plus two diodes and one selenium rectifier.

Dry battery of five 1½ volt leak-proof mono cells (Pertrix No. FP2).

Motor-car accumulator battery of six volts (with a series resistance unit LR 412 also on a 12 volt accumulator battery).

Battery life: Twenty hours or more with intermittent service.

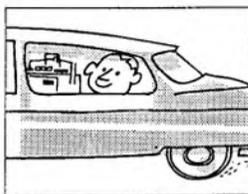
Dimensions: 15½ x 9¼ x 4½ inches.

Weight: 8½ lb.

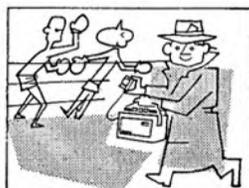
U.K. Distributors: Highgate Acoustics, 71/73, Great Portland Street, London, W.1.



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## A NEW **BATTERY** TAPE RECORDER FROM STELLA



*(Made in Holland)*

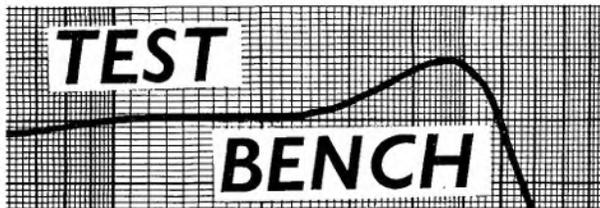
Here's a tape recorder with a true star quality!  
Completely self contained, it gives amazingly life-like  
reproduction of both speech and music. Get out  
and about—with the **Stellaphone ST470**.

● High quality recording and playback anywhere in the whole wide world—completely independent of mains power ● All transistor ● Weighs eight pounds only ● Works even while being carried ● Transparent lid allows play when closed with 3" reels: protects tape, leaves controls quite accessible ● Up to 2 x a full hour's sound on 4" double-play tape ● One constantly maintained tape speed. ● Runs economically on six one and a half volt batteries. **25 gns.** (with microphone, tape and reels)

Optional extras: Imitation pigskin carrying case with shoulder strap 45/-.  
EL 3766 Power unit for alternative operation off AC mains £5.0.0.

**Stella**  
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STELLA RADIO AND TELEVISION COMPANY LIMITED  
ASTRA HOUSE · 121/3 SHAFTESBURY AVENUE · LONDON W.G.2



# STELLA ST 470

**T**HIS all-transistor tape recorder has given me one of the easiest reviewing jobs I can remember. To begin with, I had already met two of these machines—one being used by a tape club member to record a lecture, and one being carried all round Broadcasting House (recording continuously) by a blind visitor to the "Sound" programme. I therefore knew something of the machine's performance before the Editor sent me one to try.

Even without this preview, the Stellaphone is so simple to operate that a child or adult—however allergic to technicalities—could take to it immediately.

The machine is in the upright style—popular with battery portables and at least one mains recorder (*Philips EL3514 Starmaker to be reviewed shortly*). It measures 12 x 4½ x 7¾ inches and weighs 8 lb. This means that it can be operated quite conveniently on-the-move, carried by its clip-on carrying handle (included). Three-inch reels of tape can be used with the clear plastic lid in position, or up to four-inch reels with the lid removed. The tape speed is 1½ ips, giving playing times, as follows:—Using three-inch spools of standard, long and double-play tapes respectively one has 15, 22, and 30 minutes per track. The larger spool increases these times to 30, 45, and 60 minutes per track.

The four-inch loudspeaker, mounted behind the front grille, gives plenty of volume and adequate quality considering the machine's portability and playing speed.

## THE CONTROLS

Let into a recess in this grille are the volume control and a new type of level indicator. The volume control is the edgewise type, clearly numbered from 0 to 9. I would like to see a line or arrow engraved on the case, to allow more precise setting of the knob. (Of course there is no reason why the user should not pencil on such a mark for himself). The volume control does *not*

incorporate an on/off switch. This is a good thing, since the machine might be left on accidentally, so using up valuable battery life.

The volume indicator is a simplified meter-type, the needle passing over three coloured strips on a narrow scale. During the trial recordings, it was felt that the readings—the red area represents "too loud or over-modulated" signals—gave slightly easier control than the usual magic eye indicator.

By a nice economy, this meter is also used to indicate that the battery voltage is up to par. All the time that the machine is in the "playback" position, the needle shows the battery state—Green for "O.K.," Red for "Too low for recording but satisfactory for playback." The battery complement is six U2-type 1.5 volt cells. The manufacturers recommend the leak-proof variety and that these be removed if the machine is to be unused for a long period. I would add the need to ensure that the batteries are securely inserted to press against the spring contacts. Otherwise, particularly after carrying about, loud volume from the loudspeaker may introduce a buzzing sound.

Simplicity of operation is certainly a feature of this recorder, and indeed besides the volume knob only four other controls are fitted. These are on the top deck, accessible through holes in the lid, and are (1) Fast Rewind, (2) Playback/Record, (3) Wind On, (4) Record Safety Button.

## THE ACCESSORIES

The microphone is a moving coil type, and independent tests with an expensive recorder showed that its quality of sound was well up to the Stellaphone's requirements. It is heavier than the usual crystal microphone, but this is no disadvantage, since the weight of the lead alone is often sufficient to drag a crystal microphone off the table.

A useful, if somewhat cramped, storage space is provided for the microphone, and is a feature too often omitted from portable recorders. The input socket is situated in this compartment, and also accepts the plug of the second accessory—the radio lead.

This performs several functions, according to which of the plug's three pins

are in use. The plug has a built-in resistor to avoid overloading when recording from radio, pick-up or a second recorder through the external loudspeaker sockets. A third banana plug on the lead allows you to playback through the pick-up socket of a radio, or into a second recorder, etc.

A well-illustrated twelve-page booklet supplies the few introductory hints that are necessary.

I have only two small criticisms. First, that the spools are not locked on to the spindles, and so the machine cannot be operated at any angle. Second, the plastic lid gives off a faint smell resembling that from an overheated transformer. However, this smell is one to which my dabbling in electronics has perhaps made me over sensitive and may indeed be present only on the particular machine tested.

I like the level meter, the easy tape threading, the healthily rapid fast wind and rewind, and the overall quality of reproduction which, for the somewhat limiting tape speed of 1½ ips, is perfectly adequate for speech, effects and lots of popular music. In short, I like the way that the manufacturers have passed on to the wide "general purpose" tape recording public, the benefits of good design and efficient mass-production. The result is a very low-priced machine, with a minimum of controls, that any member of the family can be trusted to carry and operate anywhere.

JOHN BORWICK

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A LOT of the pop music in the tape record catalogues is designed for background use. There is not much yet for the listener; there is even less for the specialist.

For the latter, though, is "Champion Jack Dupree," (Saga, STG 8072). It is a recital of blues by one of the most famous singer-pianists in the field.

It is strictly for addicts. Blues are not pretty. They are based on earthy values. Dupree's style is forceful if not actually violent; his playing is at times heavy, at others thunderous. The balance engineer just about won on this record, but momentarily Dupree is drowned by his own piano.

Now in his early fifties, he began life as a boxer; hence the Champion part of his name. He did not take up blues singing for a living until he was past 30.

The late Big Bill Broonzy was the king of this style, but Dupree, with Memphis Slim, seems set to take over the crown.

The most entertaining track is *Reminiscing with Champion Jack*. On this, he talks rather than sings about Broonzy, Memphis as well as a lot of less well known characters—Leroy Curtis (it sounds like Curtis but he may mean Leroy Carr), Scrapper Blackwell and best of all Tampa Red, "who had a dog who drunk more whisky than Tampa Red did."

Clearly, Dupree thinks he is in Broonzy's succession. He tells here of a film he made with Big Bill, who is alleged to have told him: "There ain't nobody playin' what you play, 'cos when you play you're on your own."

Most of the blues are known only to students. An exception is *One Sweet Letter From You*, but even this takes on quite a different form in Dupree's handling of it.

Blues inevitably have a dirge-like sound. They are unhappy songs. Often they have quite humorous under-tones. Brightest in this set is *Schnapps Drinking Woman*.

Of more general appeal is *Let's Swing* by Wendell Tracy and his Orchestra (Saga, STG 8060). Only eight numbers, but good big band arrangements. It starts off with an interesting arrangement of Ketelbey's *In a Persian Market*, which is full of fresh ideas. The promise is maintained.

As I listened, it crossed my mind that when the record was

## Beat and Off-Beat

A selection of  
the new issues



by Don Wedge

first planned it was to have been "Swinging East." It includes two Tracy originals called *Sultan Serenade* and *Moonlight in Hindustan!*

But the themes and treatment are western, though the inspiration may have been rice and curry.

Tracy contributes *Gotham Jump* and one of the best tracks is George Shearing's *Lullaby of Birdland*. This must now be one of the most recorded numbers in the world. The Tracy band's version has a rare treatment in that it follows Shearing's composition closely but avoids any of the sound developed by the composer with his own quintet.

The Tracy group lacks the fire of *Hamp's Big Band* over which I enthused last month. But it is a worthwhile addition to any collection of the "fifties" brand of swing.

Unfortunately it is dated. The new type of "percussion" music has superseded it. In this country, tape records have yet to catch up with the development.

The style originated in the United States and at first had little more function than exploiting the possibilities of stereo and the susceptibilities of hi-fi enthusiasts.

Bands, or most of them, wanting to continue recording, got burdened with as many percussionists as wind men. Cow-bells, marimbas and, seemingly kitchen sinks, were added. Subsequently music returned and the extra percussion took its place in the scores.

Ted Heath's "Big Band Percussion" set the Americans back on the path of musical merit. Recorded in London by Decca last summer, it formed most of Heath's special BBC-TV programme entered in the Montreux Television Festival.

It is available here only on disc, although it is issued on tape in the USA. Perhaps E.M.I.'s new effort to improve the pop side of its tape catalogue will result in this type of record being available. E.M.I. has many suitable discs.

A band playing in the traditional style of dance music is Russ Morgan's. It is highly mannered; perhaps Billy Ternent is the nearest equivalent in Britain.

Muted trumpets, strings, rhythm anything but forcing—that is the formula of *Dance Along With Russ Morgan* (World Record Club, TT 126). It is five-star hotel music. A great joke, too, if you care to look at it that way.

Morgan is the pianist who, in the late 'forties, had a big hit with "So Tired." Another pianist-bandleader playing in a similar style is Londoner Felix King.

Music-on-Tape has a record by him collecting many of the big hits about or from Paris of the last two decades or so (TR 1143). The mood is latin and the flavour is of the boulevards.

It starts with Cole Porter's *I Love Paris* and includes Bobby Mellin's *Paris Isn't Paris Without You*. The rest are French tunes which attained world success.

Nostalgia overtook me as I listened to Charles Trenet's *La Mer*, Georges Ulmer's *Pigalle* and Bruno Coquatrix' *Clopin, Clopant*. It is up-to-date enough to include Marguerite Monnot's *Poor People of Paris*.

I can listen to *Autumn Leaves*, *C'est Si Bon* and *Under Paris Sky's* quite often and still get pleasure. In fact, that is the effect of the whole record. The performance, within its limits, is good and tasteful.

*I Wanna Be Next* (MOT, CR3) is a set of songs by Frank Stanton, an American writer now living near London. The singer credit goes to "Mack Antony" and the accompaniment is by Harold Geller.

Most of the numbers are the sort of western ballad Gene Autrey sang to stop the gun battles, but there are some cute novelties, too: I liked *Give it Back to the Indians*.

*Valley of the Sioux* and *West of the Pecos* capture the loneliness of the prairies. Another record for addicts.

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# TAPE RECORDS REVIEWED

THE myth that only the D'Oyly Carte Company is capable of giving satisfying accounts of the Gilbert and Sullivan operettas has now effectively been exploded. It is good that Gilbert and Sullivan performances and recordings are now coming from many different sources, and the efforts of **World Record Club** represented on tape with potted versions of *The Mikado* (TT119), *The Pirates of Penzance* (11125) and *The Gondoliers* (TT129) are thoroughly enjoyable.

The trouble with the D'Oyly Carte tradition has been that routines once established have never altered, and with good musicians like those on the new tapes one is made to listen to the music afresh. The conductor is Alexander Faris, who is also conducting some of the Sadlers Wells performances of Gilbert and Sullivan. (At least I assume that Faris is the conductor on all three; the labelling of "Pirates" inconsiderately leaves out any reference to orchestra, chorus and conductor.)

Used as we are to D'Oyly Carte performances under Isadore Godfrey, Faris's speeds inevitably seem slow at times. It was much the same when Sargent's recordings started appearing. (After all it is only natural that with the sort of day-by-day routine on the same scores that Godfrey has been subjected to there should be some speeding up.) On the whole I am inclined to favour Faris and Sargent against Godfrey. Godfrey undoubtedly conveys in his best D'Oyly Carte performances greater vitality than Faris, but Faris's approach allows the delicacy of Sullivan's scoring to come out with ravishing effect. The orchestral ac-

## THE CLASSICS

by **Edward Greenfield**

(Recorded music critic of the *Guardian*)



companiment (played so the labels of "Mikado" and "Gondoliers" tell us by the pseudonymous Westminster Symphony Orchestra) is often exquisitely pointed. Slow speeds only sound stodgy when the beat is rigid and metronomic, and Faris makes something like the "Paradox" trio in "Pirates" or the Cachucha in "The Gondoliers" sound extraordinarily fresh with everyone given plenty of time to breathe. Admittedly the Cachucha is no longer the "wildest of dances".

So far so good. I wish I could report that the singing maintains an equally consistent level of excellence. "Gondoliers" is the least successful. There you have a wobbly Tessa (Ruth Little), an uncharacterful Duke of Plaza-Toro (David Croft) and a Duchess (Noreen Willett) who is both wobbly and uncharacterful. That is enough to tilt the balance against the whole performance, where on the other two tapes the vocal deficiencies are nowhere near as obtrusive.

It happens that three of the central soloists—the principal soprano Elizabeth Harwood, the principal tenor Edward Darling and the baritone William Dickie—appear on all three sets, but where in "Gondoliers" the effect of their singing is outweighed by the inadequacies of some of the others, they form a splendid core of reliability in "Mikado" and "Pirates".

Elizabeth Harwood's singing is specially welcome, for in recent years the D'Oyly Carte Company has been weak on sopranos and it is a delight to hear such beautiful arias as *The Sun whose rays* from "Mikado" and *Poor Wand'ring One* from "Pirates" sung with such richness and assurance, the latter with full cadenzas beautifully managed.

Plainly the main casting difficulty at the moment is to find the right singers for the comic parts. This was something that H.M.V. found also when it started making its star-studded series of Gilbert and Sullivan in reply to Decca's D'Oyly Carte. It chose Geraint Evans whom one would have expected to be a "natural" in the Henry Lytton/Gros-smith parts. But even he failed to convey the bite of the humour, and David Croft is only marginally better as Koko than as the Duke of Plaza-Toro while the Major General of Patrick Halstead

(Continued on page 34)

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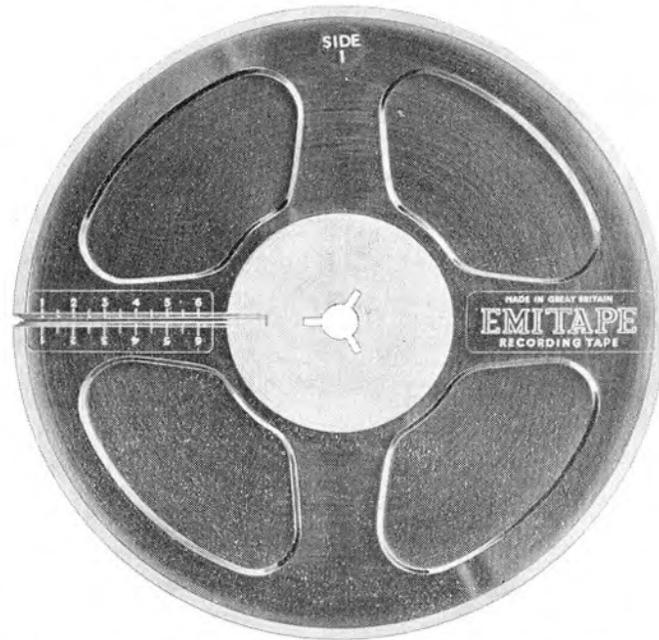
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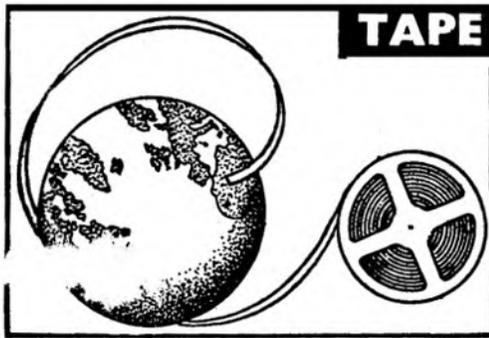
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# TAPE EXCHANGES

*Tape goes round the world! There is no comparable means—except costly travel—to form friendships with men and women in other countries and continents. Every month, in this feature, we list enthusiasts who are seeking tape contacts.*

**Anderson, C. A.** "Pinewood," Carne Close, Chandler's Ford Hampshire. Travel and camping, 3½ ips. 5½-inch spools. Grundig TK20. France and Switzerland, female contacts preferred.

**Aurich, John, R.** (39). B. Rolden, 194-Alta Gracia, Cordoba, Argentina. English and Spanish languages, audi-visual instruction, tennis, 7½, 3½, 1½ ips. 7-inch spools. Philips EL3542. U.K. contacts required.

**Bassett, Williams** (55). 61, Whyke Lane, Chichester, Sussex. 8 mm cine, brass bands, films, fishing, 7½, 3½, 1½ ips. 7-inch spools. Robuk RK3.

**Beard, Paul Anthony** (20). 9, Millfield, Folkestone, Kent. Photography, broadcasting, foreign travel, 3½ ips. 7-inch spools. Korting recorder, Germany, Austria, Scandinavia. Some French and German spoken.

**Bennett, David** (25). Turkey Mill Cottage, Ashford Road, Maidstone, Kent. Cinema, fishing, people and places, 3½ ips. 5½-inch spools. Argyll Minor two-track.

**Birch, Kay, Miss** (25). 8, Walton Place, London, S.W.3. Classical and piano music, historic buildings, 3½ ips. 7-inch spools. Philips EL3515. Canada, U.S.A. and U.K.

**Bristow, Reinald** (38). 1, Craster Road, Brixton Hill, London, S.W.2. "Pop" and organ music, general interests, 7½, 3½ ips. 7-inch spools. Reflectograph A. Germany and England.

**Bull, Victor** (20). 21, Cippenham Road, Harold Hill, Essex. 8 mm cine, motor racing, football, tennis, 7½, 3½, 1½ ips. 7-inch spools. Elizabethan FT3. Casian Trav-Ler.

**Carpenter, Donald** (24). 87, Chosen Drive, Churchdown, Gloucestershire. 16 mm cine, films and sport, 7½, 3½ ips. 8½-inch spools. Reflectograph A. Overseas contacts required.

**Casson, D.** (20). 15, Cameron Drive, Northampton. 8 mm, all music, cinema, 3½ ips. 5½-inch spools. Grundig TK20, Philips EL3585. Majestic tape recorders. Female contacts preferred.

**Cornwell, E.** (30). 12, Essex Court, Rockhurst Drive, Eastbourne, Sussex. Spanish and German languages. Spanish music, 7½, 3½, 1½ ips. 7-inch spools. Regentone RT51. Spain, Spanish America, Latin countries.

**Cresdee, Douglas B.** (20). 65, Gregson Avenue, Bridgeway, Gosport, Hampshire. Art, jazz, medicine, motor-racing, 3½ ips. 5½-inch spools. Sound Riviera. U.S.A., Canada, Germany.

**Cronin, Ben R.** (20). 6, Norfolk Terrace, Brighton, Sussex. 3½ ips. 5½-inch spools. Peto-Scott, four-track. Female contacts required in S.E. England. Letters not needed.

**Cunningham, John** (33). 3, Flamstead Street, Allenton, Derby. Classical music, literature and writing, 15, 7½, 3½, 1½ ips. 7-inch spools. Brenell 3 Star. U.K., France, U.S.A.

**Daisy, Leonard** (23). 36, Trebourir Road, Kensington, London, S.W.5. Cinema, "pop" music, dancing, theatre, 3½ ips. 5½-inch spools. Grundig TK14. England, France, Canada, U.S.A.

**Dallas, Alfred.** 32, Lowman Road, London, N.7. Photography, languages, music, people, 7½, 3½, 1½ ips. 7-inch spools. Philips EL3542, four-track. Letters first please.

**Downton, Fred** (33). 3, Rustic Place, Dundee, Scotland. Cine photography, travel, folk music, 15, 7½, 3½, 1½ ips. 10½-inch spools. M.S.S., E.M.I. L2B, Nagra, Fujiya. Australia, Hong Kong, U.S.A., Far East.

**Ferlow, Klaus** (24). c/o Ring der Tonbandfreunde, Hanover-Nainholz, West Germany. "Pop" and jazz music, sport esp. football, 3½ ips. Philips RK14, four-track. English-speaking male contacts required (20-30 years).

**Freere, D. B.** (21). 21, Charldane Road, London, S.E.9. Motoring, religion, 3½ ips. 5½-inch spools. Grundig TK14.

**Garthwaite, C. V.** (27). 39, Lynton Avenue, London, W.13. Aviation, 3½ ips. 6-inch spools. Alba recorder.

**Gilbert, Alan** (26). 17, Ashdale Road, Liverpool 18, Lancashire. Photography, modern jazz, football, cricket, 3½ ips. 7-inch spools. Philips EL3541. Letters not required.

**Hannah, Ray B.** (23). 1, The Cottages, County School, North Elmham, Dereham, Norfolk. Photography, travel, languages, C and W music, 3½ ips. 5½-inch spools. Argosy 28TR recorder. Holland, Belgium.

**Hunt, Derek** (31). 68, Hay Green Lane, Bournville, Birmingham 30, Warwickshire. Photography and records, 7½, 3½, 1½ ips. 7-inch spools. Elizabethan Princess, two-track. Male contacts only, letters not needed.

**Ryan, D. P.** (33). 140, Beach Road, Christchurch 7, New Zealand. Irish traditional music and songs, 3½ ips. 5-inch spools. Philips.

**Scouthorpe, Cleeve John** (28). 82, Lichfield Road, Coleshill, Birmingham. Swimming, cycling, camping, 7½, 3½, 1½ ips. 7-inch spools. Elizabethan FT3, Argyll Minor, Philips EL3585. Male contacts only, no musical tapes.

**Sharpe, Joseph H.** (39). 63, Binscombe Lane, Godalming, Surrey. Politics, light classical music, civil defence, 7½, 3½, 1½ ips. 7-inch. Brenell 3-star, four-track.

**Scott, Donald A.** (40). 6, Kent House, 5 South Shed's Place, Gibraltar. Photography, writing short stories, astronomy, 3½ ips. 5-inch spools. Uher 514, four-track.

**Smith, Brian** (21). 69, Watersmeet Road, Wyken, Coventry, Warwickshire. "Pop" music, general interests, 7½, 3½, 1½ ips. 7-inch spools. Cossor CR1601/2, four-track. Germany (English-speaking only).

**South, W. H.** (42). 275, Cavendish Road, London, S.W.12. 8mm cine, family life, light, "pop," and organ music, 7½, 3½ ips. 7-inch spools. Grundig TK8 and TK5. Germany (German spoken).

**Stevens, Tony** (32). 89, Hughenden Road, Hastings, Sussex. Salvation Army bandsman, 7½, 3½ 1½ ips. 7-inch spools, Cossor, four-track.

**Tate, Patricia A., Miss** (21). 21, Lincoln Avenue, Wallsend, Northumberland. Travel, reading, swimming, dancing, 3½ ips. 3-inch spools. Philips and Grundig TK40.

**Tame, Charles E.** (40). 18, Bideford Road, Enfield Lock, Middlesex. Science fiction, jazz, general interests, 3½ ips. 5½-inch spools, Grundig TK20. U.K., U.S.A., Germany. Letters not required.

**Tisdale, William** (41). 6, Dawlish Drive, Stevchale, Coventry, Warwickshire. 8mm cine, electronics, chess, music, 7½, 3½ ips. 7-inch spools. Korting stereo. Telefunken 75-15.

**Walton, Edmund A.** (22). 66, Alexandra Road, King's Langley, Hertfordshire. Photography, classical music, cycling, 7½, 3½ ips. 7-inch spools. HMV DSR1. U.K. especially Irish traditional music lovers.

**Kendall-Ward, Clifford** (31). 30, York Street, London, W.1. Photography, music, sports, world affairs, 3½ ips. 3-inch spools. Philips EL3541, four-track.

**Wood, John** (23). 62, Kingarth Street, Glasgow, S.2, Scotland. Outside recordings, travel, music, short stories, 3½ ips. 7-inch spools, Stella, Grundig TK1.

**Yeap, Quan** (21). 36, Longridge Road, S.W.5. Languages, music, politics, 3½, 1½ ips. 5½-inch spools. Telefunken 76, four-track.

## FAMILY EXCHANGES

**Nye, Mr. and Mrs. R. J. H.** (25). Newcastle House, 22A High Street, Lewes, Sussex. Handicrafts, gardening, records, T.V. and radio, 7½, 3½, 1½ ips. 7-inch spools. Elizabethan FT3. U.K., U.S.A., France, Belgium, Netherlands.

## TEENAGE EXCHANGES

**Aversano, Heinz Friedrich** (16). Kortenredder 2, Hamburg—Ohlstedt, Western Germany. Photography (transparencies), "pop" records, 7½, 3½, 1½ ips. 7-inch spools. Grundig TK40. Seeks exchanges with English youth.

**Donaldson, Leonard John** (17). 112, Saint Fagan's Road, Fairwater, Cardiff, Glamorganshire. Trad jazz, classical music, G. and S. Operas, general topics, 7½, 3½, 1½ ips. 7-inch spools. Philips EL3536, stereo four-track. Germany, U.S.A., Australia, New Zealand, Canada, U.K.

**Ferguson, Anthony J.** (15). 2, Crown Street, Eastbourne, Sussex. Electronics, classical and "pop" music, radio and T.V., 7½, 3½, 1½ ips. 7-inch spools. Robuk RK3, Wiltshire.

**Hillman, Anthony** (19). 93, Horsneile Lane, Bracknell, Berkshire. Philately, driving, cycling, 3½ ips. 5½-inch spools. Grundig TK14. U.K., female contacts preferred.

**Mackenzie, William F.** (15). 81, Gilmore Place, Edinburgh, Scotland. "Pop" music, general interests, 3½ ips. 5½-inch spools. Grundig TK20. Australia or U.S.A.

**McCabe, Jack** (16). 179, Henshaw Street, Oldham, Lancashire. Reading, sport, modern jazz and "pop" music, 3½ ips. 5½-inch spools. France, Australia, Canada. Female contact, same age, required.

**Mitchell, Stuart** (16). 78, Pendennis Road, Streatham, London, S.W.16. Religion (pentecostal), 3½ ips. 7-inch spools. Grundig EL3541.

**Newport, John** (18). 98, Ridsdale Road, Anerley, London, S.E.20. Reading, jazz, skating, 7½, 3½, 1½ ips. 7-inch spools. Elizabethan FT3.

**Oliver, John** (17). 59, Seaford Street, Shelton, Stoke-on-Trent, Staffordshire. Photography, rock 'n' roll "pop" music, 7½, 3½ ips. 7-inch spools. Sound studio, two-track, U.S.A. or Luton, Beds.

**Page, Clive R.** (19). 35, Fanshaw Road, Cambridge, Cambridgeshire. Photography, sport, travel, films, music, 3½ ips. 5½-inch spools. Elizabethan, two-track. Female contacts in U.K. preferred. Letters not required.

**Riddiough, Alan** (19). 19, Carmona Gardens, Shipley, Yorkshire. 35mm photography, "pop" music, 3½ ips. 5½-inch spools, Fidelity Major, four-track. U.K. only.

**Saunders, Linda** (13). 20, Nightingale Road, Hampton, Middlesex. Drama, French language, "pop" music, 15, 7½, 3½ 1½ ips. 8½-inch spools. England and France.

**Saxton, Ian Edward** (16). 51, Whitehill Road, Crayford, Kent. Photography, "pop" music, dancing, 7½, 3½, 1½ ips. 7-inch spools. Elizabethan FT3, four-track. America, France, Australia. Female contacts preferred.

**Singfield, Richard C.** (19). Blue Boar Hotel, Cambridge. "Pop" music, general interests, 3½ ips. 5½-inch. Grundig TK20. Female contacts preferred.

**Wackett, David** (19). 150, Archer Avenue, Southend-on-Sea, Essex. Motor mechanics, "pop" records, 7½, 3½ ips. 7-inch spools. Sound 444, two-track.

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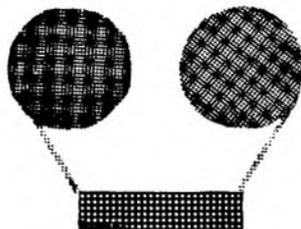
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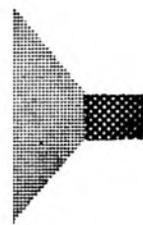
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## NEW PRODUCTS



# AN EVER-READY RECORDER

**T**HE first fully automatic tape recorder, shown for the first time at the London Audio Festival was recently introduced by Welmec Corporation.

The new model, the Magnetophon Automatic, has been designed so that the controls are kept down to the barest essentials. It has only five controls: record, stop, playback, rewind and volume. There is no on-off switch, recording level control, nor input selector switch. The functions of these are completely taken over by the automatic control system.

The instrument is designed to be permanently connected to the mains supply, the valves being pre-heated by a trickle switch so that no time is lost in warming up. This is also claimed to lengthen the normal working life of the valves.

Normally the recorder is connected through to the radio. If a microphone is to be used, it is plugged in and automatically gets priority. The recording level control is automatically adjusted whatever the level or volume of sound reaching the equipment. A magic eye is



### The Magnetophon Automatic

retained on the machine merely to convince the sceptics that the level is being adjusted.

Another device selects the point at which the tape and stop feature is operated. The metal foil does not operate the tape end stop mechanism at the beginning of the tape, only at the end or after rewinding.

The new model is mechanically identical with the "70" series of Magnetophon recorders. This includes a single speed of 3½ ips, and accommodation for 5½-inch spools. The claimed frequency response is 40-14,000 cps with signal-to-noise ratio given as greater than 40dB. Wow and flutter is rated as within 0.2 per cent weighted. N.A.R.T.B. recording standards are used.

Playing time available on this two-track recorder is 91 minutes per track, using double-play tape. Rewind for this length of tape is given as approximately four minutes.

The valve line-up includes an EF 86, EF83, ECC 83, EM 84, EL 95, B 250/C75/K4, EE 30/C5/K1, E30/C5/K1. The mains voltage is suitable for 110, 200, 220 and 240v, and the mains frequency is 50 cycles which can be switched to 60 cycles. Standing consumption is approximately 10 watts; running consumption approximately 40 watts.

Welmec Corporation Limited, 147/8 Strand, London, W.C.2.

## NEW STEREO AMPLIFIER

**R**ECENTLY introduced to the British market is a high-fidelity stereo amplifier, manufactured by Bang & Olofsen of Denmark. Housed in an attractive teak cabinet, the type 608 is an integrated two-channel (15 watts each channel) amplifier which can be used for either stereo or mono reproduction from gramophone, radio, tape recorder or microphone.



### Bang & Olofsen stereo amplifier

The frequency response is claimed to be 20-20,000 cps  $\pm$  1dB per channel. Distortion is said to be less than 0.5 per cent below ten watts and less than 2 per cent at 15 watts per channel. Power consumption is 72 watts and output impedances 4 and 16 ohms.

Among the features is included a unique visual display of the frequency response for any given setting on the tone controls.

The price of the amplifier is £59 3s. 6d. Aveley Electric Limited, South Ockenden, Essex.

## R-E-S EXPANDS

**R**-E-S (COVENTRY) LIMITED, of 28, Far Gosford Street, Coventry, who have already expanded from small beginnings to having four branches, are opening their fifth branch. The new shop will be in a covered arcade of shops known as City Arcade.

# ANOTHER GRUNDIG MODEL

A FOUR-TRACK recorder in the popular price range is the latest model to come from Grundig. The new model, designated TK23, is a single speed machine running at  $3\frac{3}{4}$  ips. Basically it is a four-track version of their TK14.

Simple piano key push button controls are provided, and other features include pause control, automatic tape-end stop, facilities for synchronised superimposition with the aid of a monitor amplifier Type MA 2, and mixing between microphone and radio/pick-up or diode and radio/pick-up. A digital rev. counter is fitted and it employs a magic eye recording level indicator.

Accommodation is provided for  $5\frac{1}{2}$ -inch spools, providing a playing time of 91 minutes per track using double-play tape.

The valve line-up includes EF86, ECC81, EL95, EM84, and an EF86. An additional valve reduces the hum and noise figures and provides the extra gain required by the input mixing controls.

The quoted frequency response is 60-12,000 cps and the signal-to-noise ratio is given as 47dB. Wow and flutter figures are said to be  $\pm 2$  per cent.

The TK23 is housed in a two-tone pastel grey cabinet, and weighs 20 lbs. It measures  $14\frac{1}{2}$  x  $11\frac{1}{2}$  x  $6\frac{1}{2}$  inches, and is



supplied complete with a reel of long-play tape, spare spool, connecting leads, and a GDM 18 moving coil microphone. The price is 45 guineas.

Grundig (Great Britain) Limited, 40 Newlands Park, Sydenham, London, S.E.26.

## More tape records announced

A MOVE to intensify the sale of tape records has been made by the formation of a new company, Tape Recordings London Ltd., who are to distribute tape records, background music and playback equipment.

At present they are handling the Music-on-Tape and Esoteric labels, and the recordings to be carried by the new company will be drawn from the Top Rank, Colrich Audion, Omega, and Caprice (U.S.) labels, mostly available in mono and four-track stereo at  $3\frac{3}{4}$  and  $7\frac{1}{2}$  ips. A 48-hour delivery service is now in operation.

Tape Recordings London Limited, 59a, Edgware Road, London, W.2.

## NEWS IN BRIEF

R. H. COLE (OVERSEAS) LIMITED have been appointed sole U.K. Agents for the range of magnetic tape heads manufactured by Wolfgang Bogen G.m.b.H. of Berlin.

Among the components made by this West German company are mono and stereo heads for domestic tape recorders, erase heads, and a range of very high-quality single and multiple heads for professional applications.

R. H. Cole (Overseas) Limited, 2, Caxton Street, Westminster, London, S.W.1.

HIGH tape recorder sales are announced for last December, according to the latest figures released by the Radio and Television Retailers Association.

For the first time tape recorder sales, taken from the R.T.R.A. membership, have been compared with the previous year's sales, and the figure (average units sold per shop) leapt from 2.4 in November to 5.7 in December. In December 1961 the figure was 4.8.

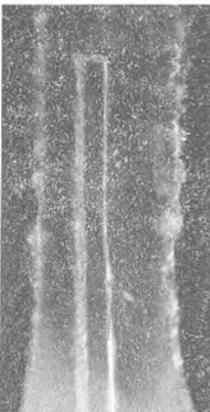
A further division of these figures shows the percentage of units sold on hire purchase terms. In November 50.8 per cent were sold in this way, and the figure decreased to 45.1 per cent in December. The December 1961 figure was 56.2 per cent.

## TRIPLE-PLAY TAPE

AN extension of the playing times available for tape recorders is presented as a result of the recent announcement by Agfa Ltd. of their new Triple-Play Tape.

Their new product, to be designated PE65, will be available on three-inch and five-inch spools holding 450 ft. and 1,800 ft. respectively. The prices for these two lengths will be 23s. 9d., and 66s. 3d.

Examples of the extended times available can be assessed using  $3\frac{3}{4}$  ips as a basis. With the new 450 ft. tape on a three-inch spool fifty minutes recording can be achieved. Previously the same playing-time was only available on long-play tape on a four-inch spool. Three hours and twelve minutes are available



on the five-inch reels holding 1,800 ft. of triple-play tape. This playing-time once meant the use of a seven-inch reel of long-play tape.

A graphic illustration of the reductions achieved in the thickness of the new triple-play tape is provided in our photograph left. This shows a section of PE65 tape compared to the width of a human hair. The photograph has

been enlarged a thousand-fold. First deliveries of the new tape are expected to be at the end of June.

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**S. M. WHEATLEY'S  
NOTEBOOK**

*(Continued from page 19)*

use a well-made mains transformer which is suitable boxed or screened. The metal screen and the earth wire of the cable should be well bonded and earthed. Never extend AC/DC apparatus. Better safe than sorry, and it is no good recording the high-pitched scream that only the Coroner can comment upon.

Microphone extensions are quite different, and no risk is attached to dozens of yards of quite light flex for this purpose if the input is of a low impedance. John explains that extending the microphone lead requires the use of a moving coil or ribbon microphone. Many domestic recorders use crystal microphones, and the leads of these can only be extended to 30 or 50 ft., without loss of the high frequencies. A

**TAPE RECORDS REVIEWED**

*(Continued from page 29)*

in "Pirates" is equally uncommanding. I think older singers than these (I assume they are comparatively young) would find the job easier. I hope, too, that if the series is being continued a more consistent contralto will be found. Noreen Willett is reasonable enough in slow, sustained passages but she sounds very shaky at more dramatic moments. It is partly that the microphone catches, and I imagine exaggerates, her vibrato in an unpleasant way.

The recording is well up to World Record Club's highly creditable standard. That is except for track 2 of my copy of "The Gondoliers". There something terrible has happened to make the sound fuzzy and indistinct with little volume and no top at all just as though it is being reproduced from the other side of the tape. I cannot imagine that more than my copy is affected, and anyone who does suffer must obviously get a replacement.

The most exciting of the WRC stereo tapes I've yet heard is a really superb account of Dvorak's *New World* symphony by Leopold Ludwig and the London Symphony Orchestra (STT73 [38 minutes] £2 10s.) to rival any I have ever heard in recorded form.

The intensity of a live performance is here in full measure. Ludwig driving hard but always with understanding and sympathy. In any case after the brilliance of the first movement, the slow movement relaxes over the glorious cor anglais melody in sumptuous sounds that are never merely sentimental and the last two movements again show the orchestra in its most vital form, the definition of the tricky scherzo theme superbly crisp on the woodwind.

This is an Everest recording made, I imagine, several years ago, but one certainly could not detect the age from the sounds themselves. I hope that World Records will now be able to live up to this very high standard.

suitable microphone transformer can be obtained which will enable the use of a moving coil microphone with your recorder instead of the crystal instrument. This transformer should be mounted in or on the recorder cabinet, but care must be taken to ensure that it will not pick up hum from the mains wiring of the recorder. It is advisable to consult the manufacturer before attempting this, especially if the machine is still under guarantee.

The final remarks on the *Emiguide* concerned microphone windshields. Wind noise was well demonstrated, and John's simple advice to cover the business end with a handkerchief will serve. However, if much outdoor recording is to be done I suggest one or two thicknesses of silk stocking material well secured by rubber bands to keep it taut over the face of the microphone. Better still, construct a dome of fine wire gauze lined with silk. Non-rusting material, similar to that used in petrol funnel filters, should be used.

Crystal microphones do not lend themselves easily to such covers. They are too sensitive to fingering or scratching. In these cases, and as a general rule in rough weather, try to get into the shelter of a building or tree, or protect the microphone with your body so that the worst effects are reduced.

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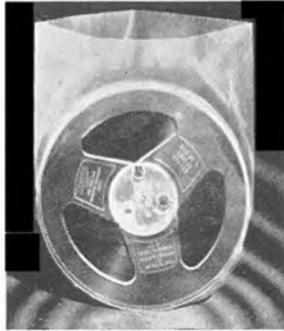
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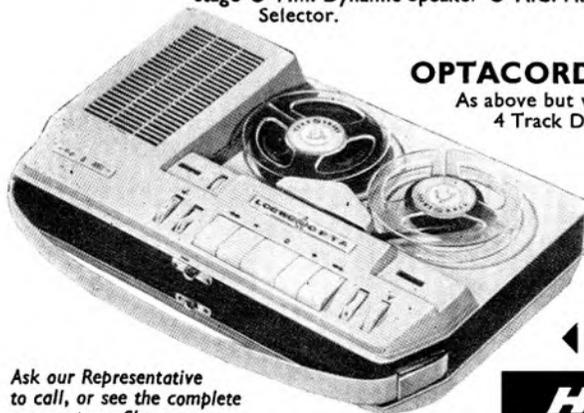
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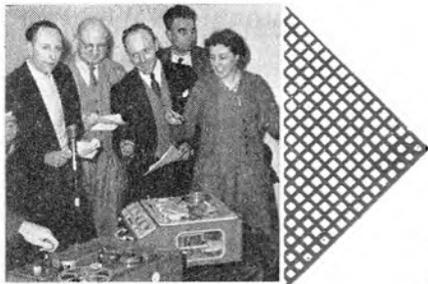
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# News from the Clubs

## BETHNAL GREEN

Members of the Bethnal Green society recently visited the Universal Programmes Corporation in London's Portland Place. There, under the guidance of Mr. Allen Stagg they were shown many of the functions of a busy recording studio including the production of microgroove master i.p. discs in both mono and stereo.

The club members also visited the studios and mixing and dubbing rooms.

On May 18 the members held an "open night" at Bethnal Green Town Hall.

## BOSTON

The first meeting of the newly-formed Boston tape club was held on May 21. Six members attended and a further half-a-dozen professed interest.

They elected Philip Towell of 107, Spielsby Road, to serve as their first secretary, and Mr. Robert Hirst of Balmoral Electronics agreed to be the technical adviser.

Meetings are to be held on the 2nd and 4th Tuesdays in the month at Pilgrim College, South Square, beginning at 7.30 p.m.

One of their first decisions was to seek membership of the Federation of British Tape Recording Clubs.

## COTSWOLD

Their first attempt at stereophonic recording was made by the Cotswold members at the April 19 meeting. For the occasion the members welcomed along the Nailsworth String Quartet, a group of local amateurs who have twice gained the supreme award at the Cheltenham Competitive Festival.

Recorders in use ranged from the Tandberg Six, operated by Colin Woods, to the Grundig Cub battery portable. Others used included larger Grundigs, a Philips four-track, a Ferguson-Motek, and a Simon SP4. Reslo microphones and AKG headphones were among their list of associated equipment.

Simon, STC, Gramplan, Grundig and Philips microphones were later brought into use when the quartet was joined by a soprano who sang a series of ballads.

At their meeting on May 17 members welcomed Mr. K. Monks of Fi-Cord International who demonstrated the new 202 mains/battery recorder, and the Beyer range of microphones.

Test recordings were first made in the hall, and a group of members then went into the streets of Cheltenham to operate the machine for themselves. Peter Turner interviewed a bus inspector, and other members made recordings of exhaust and engine noises of the buses. On replay the group reported that the 202 is extremely easy to use, although rather heavier than the earlier famous 1A.

A competitive spirit entered the proceedings when it was announced that the field party had been accompanied by a baby Stella which blared its defiance at its more expensive rival.

Amongst recent recording assignments was a complete version of Gilbert and Sullivan's opera *The Sorcerer*, performed by pupils of Cheltenham Grammar School. Peter Turner and Peter Duddridge had sited themselves in a classroom leading off the main hall leaving their microphones slung across the hall on a rope.

Mr. Duddridge, continuing his series of BBC broadcasts, has interviewed Al Read, the Clitheroe Kid, Max Byraves, and other stars on behalf of the club's Hospital's Service. A typical message was recorded from Spike Milligan who advised the patients to "stay in as long as you can chaps, it's hell outside."

Colin Wood offers his tape, illustrating common recording faults and their corrective measures, to any club who cares to apply to the secretary. The tape runs for about thirty minutes at 7 1/2 ips. Inquiries direct to Peter Turner at Cave Cottage, Oakridge Lynch, Stroud, Gloucestershire (Frampton Mansell 231).

## MIDDLETON

Since the formation of the Middleton club earlier this year, the membership has grown from three to a total of 27. Average attendance has been around the fifteen mark for their weekly (Thursday) meetings.

A number of outside recording sessions have crept into the curriculum including the recording of the Oldham Carnival Parade, church services, and a rock'n'roll group. Three of their members also attended the Audio Festival and with the aid of a Philips battery portable recorded the comments from a number of manufacturers.

A beginning of a social service programme was made when the members visited the local Blind Service Centre to present an edited version of the carnival parade tape together with a recording of a tape play called *Freedom*. This had been produced by members of the Hounslow tape club and specially loaned for the purpose.

## READING

One of the latest meetings of the Reading tape and cine group included a session of test recordings. Individual members had produced tapes on various subjects and these were played back for the meetings discussion.

First to be heard was a tape designed to check constancy of speed on recorders. Next, the members heard a one-minute tape of the BBC timing signal which was played back through an oscilloscope to test linearity of the record/replay amplifier.

The third demonstration consisted of recordings of a piano note (middle C) to check for wow and flutter content of the machines; and the fourth and final test was to examine the variety of effects obtainable from speech recordings under different conditions, to establish the importance of microphone positioning.

## RUGBY

The March 15 meeting of the Rugby club saw the welcome return of their secretary Michael Brown who has been in hospital. The guests at this meeting were E.M.I. Tape Ltd., with a return visit being paid by Mr. L. W. Saunders, the Technical Sales Supervisor. Also present was John Borwick, who gave an illustrated talk on microphone positioning. He also played a tape of sound effects—one of his Emiguide productions—and demonstrated a mixer unit and tape splicer. To round off a very successful evening Mr. Borwick walked away with the first prize in the quiz tape provided by G. Middleton.

## TAPEWORMS

News of the appointment of a UK representative for the American Organisation known as "Tapeworms" is announced. Persons interested in obtaining further information about this club are invited to write direct to Roy Preston, 4 Queens Road, Maidstone, Kent.

This society has no subscription, being formed from tape enthusiasts interested in exchanging tapes.

## TRURO

News from another new club was received from Cornwall. Since their inauguration the members of the club in Truro have achieved a number of recordings. These have included a stage play for converting to a radio play; a concert by a local Male Voice Choir for eventual transmission in hospitals; and a "pop" talent contest at the City Hall, judged by Alan Freeman. Their recording of the *Staggerlees*, winners of the contest was used in one of ITV's news items. Later they recorded an audition tape for this group for a major recording group.

All of the tapes thus produced have now been edited and fed into a programme for local hospitals and old people's homes.

During May they were to record another choir, a Civil Defence exercise, and impressions of a visit to Goonhilly Downs G.P.O. Satellite radio station. They also made a start on a sound dictionary of Cornish birds.

The club meets on the last Wednesday in the month during the summer. They propose to increase meetings to fortnightly when the winter evenings draw in. Further details may be obtained from secretary, J. N. Burgess of Old Church Cottage, Mount Hawke, Truro, Cornwall.

## WALSALL

An evening listening to the respective merits of various loudspeaker units was enjoyed by members of the Walsall club recently. The lecturer was Eddie Boffey who described his construction and experiments with a number of units. The following week a new member, a 14-year-old boy, appeared complete with diagrams to show how he had built the column speaker described by Mr. Boffey.

Young enthusiasts were again to the fore at a later meeting when two teenagers volunteered to provide a tape and slide show. The taped commentary included background music, sound effects and comical comments which made the finished programme well worth watching and hearing. To follow, the two youngsters then put the squeeze on the older members by presenting a quiz tape.

Microphones was the topic at their last meeting when Secretary Joan Walford, well-versed on the subject, spoke about the different types and their make-up, providing diagrams to show how they work. A practical evening to follow her lecture up is now proposed.

Members Tape Time recently produced a 45-minute session from one of the members who, although relatively new to the hobby, offered a programme of tapes of music, speech, his Swiss-French wife singing and his son doing his homework.

At one of their meetings a few weeks ago they welcomed members of the Coventry club along. The combined membership then saw the film *This is the BBC*, which describes 24 hours behind the scenes in the life of broadcasting.

## WEST HERTS

When the latest of the Curry's *Make-a-Tape* contests was judged recently on Radio Luxembourg the members of the West Herts club had a particular interest in listening for the result. The eventual winner in the children's section was David Hovell singing *Ave Maria*. He is a choir-boy at St. James's Church, West Hampstead, where the recording was made. The tape had been produced by club member Michael Coates.

Their tape in the British Amateur Tape Recording Contest is almost ready for submitting. A run-over of the tape was made at Hemel Hempstead on May 16, when a few points concerning editing was cleared up in an attempt to make it a little slicker. Dubbing was the order of the day for the rest of the evening with a free-for-all to round-off.

Earlier in the month members heard Mrs. Brammer give a lecture on how to use the tape recorder for speech training. Examples of good and bad speech were given, and afterwards the members attempted to "talk proper" by reading excerpts from Dickens on to tape.

Only a few members turned up for the sound hunt organised for May 6. A drive around Watford provided the location for recording a number of sounds listed once again by John Grainger. Train effects, footsteps in tunnels, and telephone conversations were among the sounds sought, and heard during tea at John and Jean Grainger's home afterwards. George Richardson produced the better recording on his Grundig TK1, whilst the tape made by the Minivox team was judged to be the most humorous.

Latest exercise of the club is to produce a composite tape of member's use of their recorder with examples if possible. They propose to contact other clubs with this idea in mind.

The closing date for their Grainger-Holloway internal tape competition cup has been extended to August 31.

## WHITSTABLE

When sound effects, requested by the Playcraft Theatre Group of Canterbury, required the hubbub of an angry crowd the Whitstable members were hard put to obtain a satisfactory noise. Their initial attempt, which sounded magnificent during recording, finished on playback sounding like a flock of angry sheep.

One member then suggested each person should read a few lines from different books. This proved much better, although still not sufficiently angry. A number of suggestions were then put forward, but it was not until the treasurer suggested putting up subscriptions that the final effect was achieved.

So satisfied were the Playcraft Players that they enlisted the help of the club again for their production of *Crime Passionel*, their latest play. The action called for numerous sound effects including radio announcements, explosions, gunfire, German military traffic, grenades exploding, glass smashing and various cars. There should be plenty of fun in store for members compiling that little list.

Tom Robinson provided part of the entertainment for the May 7 meeting when he gave another in his series of illustrated talks on elementary tape matters. This time the subject was editing and splicing, and the illustrations included compiling a song of excerpts from a number of musical numbers.

At a later meeting the members heard that the drama group were very pleased with the sound effects provided for their production *The Lady's Not For Burning*. Member Peter Hadley put in a lot of hard work supervising at all the rehearsals and at the five evening performances.

At another meeting, chairman Bill Blake's presentation of the first of a new series entitled *A Generation of Sound* proved the star feature. Members sat enthralled as they heard again voices and sounds of the past 35 years. Subsequent instalments are to be heard monthly.

A demonstration of stereo tapes was given at the same meeting when new member Bob Watson demonstrated the stereo version of the Simon Minstrelle. Another recorder in use was the Philips stereo machine.

Their fortnightly quiz was again won by secre-

tary Tom Robinson. Enough material for another "angry crowd" scene was available when this decision was greeted with calls for handicaps and a request to put the bar up to his entries. Perhaps the members are eased by the secretary's refusal to accept the prizes. At least the club's fund benefits if no-one else does.

At a later meeting members heard electronics expert Bill Holt give a talk on the technical aspects of recording. They also were entertained to a thirty-minute tape/slide show.

Peter Hadley then presented the first episode of a new mystery thriller serial. At subsequent meetings members took turns at carrying the plot along. From Peter's start it would seem the following members would have to be a cross between Agatha Christie, and Tommy Cooper. Bill Austen and Stuart Addison proceeded to make things complicated when they recorded episode two for the next meeting. The younger generation, members Michael Glover (14) and Peter Robinson (12) had their turn at the May 21 meeting when they presented the third episode. Varied accents, sound effects, and touches of typical schoolboy humour found their way on to the tape and the recording eventually spooled its way to the point where the next 'victim' had to take over.

Also at their May 21 meeting members heard the beginning of a round-robin tape club bulletin inaugurated by the North London club. Their own contribution was then added and the tape sent on its round.

Other activities have included compiling a documentary; making a competition tape; and recording in stereo. Tom Robinson with treasurer Peter Hadley and Bill Blake made a number of visits to the local Boy Scouts H.Q. with a Tandberg and Philips stereo recorders to record the band's repertoire. They hope to make an I.P. disc from the material collected.

These same three members have also been seen skulking in nearby woods with a Steelman Transstape, a Fi-Cord and associated equipment, at various times during day and night. Their story is that they are seeking to record a nightingale.

## WORLD TAPE PALS

The UK Section of World Tape Pals held its first get-together in London on April 28. About sixty persons attended from places as far apart as Newcastle and Bournemouth, Margate and Bridgend, S. Wales.

They heard reports on the growth and work of WTP by representative John James, and this was followed by a discussion on future plans and members queries.

The evening session was the highlight of the day's proceedings, with Denys Killick, our Special Assignment contributor, judging the tapes in their national tape competition. Prizes for this contest were awarded by Messrs. E.M.I. Tape Ltd, and Wellington Acoustic Laboratories. The eventual winner was Mr. Ron Hall of Radlett, followed closely by Gilbert Matthews and Philip Towell.

**ABERDARE:** Alternate Wednesdays at Cwman Institute. Cwmanan. (June 27.)  
**ABERDEEN:** 1st Tuesday in every month at 8, Deer Road, Woodside.

**AYLESBURY:** Monthly at Hazell's Club, Britannia Street. (June 27.)

**BARNSELEY:** Every Tuesday at YMCA, Eldon Street.

**BATH:** Every Wednesday at 24, Green Park.  
**BATH (2):** Alternate Wednesdays at 41, Herbert Road, Oldfield Park.

**BEDFORD:** Final Tuesday in month at 131, London Road.

**BELFAST:** Every Thursday at 44, Dublin Road, Belfast 2.

**BIRMINGHAM:** Every Monday at the Chapel Tavern, Ludgate Hill.

**BIRMINGHAM (SOUTH):** Alternate Mondays at The People's Hall, Oak Tree Lane, Selly Oak, Birmingham 29. (July 2.)

**BLACKBURN:** 1st and 3rd Tuesdays at Blackburn YMCA.

**BLACKPOOL:** Alternate Wednesdays at the Albert Hotel, Lytham Road. (June 20.)

**BOSTON:** 2nd and 4th Tuesdays at Pilgrim College, South Square.

**BOURNEMOUTH:** Alternate Tuesdays at the Pembroke Hotel, Poole Hill. (June 26.)

**BRIDGWATER:** Every Tuesday at Evis' Radio Shop, West Street.

**BRIGHTON:** Every Wednesday at The Brunswick Arms, 38, Ditchling Road.

**BRISTOL:** Alternate Wednesdays at 6, Royal York Crescent, Clifton, Bristol 8. (June 27.)

**BROMLEY:** 2nd and 4th Thursdays at St. Mary's Church Hall, College Road.

**CAMBRIDGE:** Every Wednesday at the Mitre Hotel, Bridge Street.

**CARDIFF:** Mondays, Tuesdays and Wednesdays at 51, Charles Street.

**CHESTERFIELD:** Every 3rd Monday at the Yellow Lion Inn, Saltergate. (June 25.)

**CLACTON:** Every Monday at Ebor Lodge Hotel.

**COTSWOLD:** Fortnightly, alternating Monday and Thursday at Bayshill Hall, Royal Well Lane, Cheltenham. (June 25.)

**COVENTRY:** Alternate Wednesdays at Holy Park Hotel. (June 20.)

**COVENTRY** (audio and cine): Alternate Tuesdays at the Liberal Club, Union Street. (July 3.)

**CRAWLEY:** 1st and 3rd Mondays at Southgate Community Hut.

**DARTFORD:** Every Thursday at 41, Winsor Drive.

**DERBY:** Alternate Wednesdays at Osmaston Park Hotel. (June 20.)

**DONCASTER:** Alternate Thursdays at Lancaster House, Westlith Gate. (June 21.)

**DOVER:** Alternate Mondays at the Priory Hotel, Dover. (June 25.)

**DUBLIN:** 1st Monday at "Hardy House," 6, Capel Street.

**DUNDEE:** Alternate Mondays at The Salvation Army Hostel, 31, Ward Road. (July 2.)

**EASTBOURNE:** Alternate Saturdays at Hartington Hall, Bolton Road. (June 23.)

**EAST HERTS:** Alternate Mondays at 3, Chadwell, Ware. (June 25.)

**EDINBURGH:** 1st and 3rd Wednesdays at 82, Newbattle Terrace, Edinburgh 10.

**GLASGOW:** Fortnightly, alternating Tuesday and Thursday at the Highlands Institute, Berkeley Street, Glasgow. (June 21.)

**GRIMSBY:** First Monday at 21, Langton Drive, Nunthorpe, Grimsby.

# CLUB MEETING DIARY

**HARROGATE:** Every Wednesday at 4, Belford Road.

**HASTINGS:** Every Tuesday at the Citizens' Advice Bureau, Cambridge Gardens.

**HINCKLEY:** Alternate Wednesdays at The Wharf Inn, Coventry Road. (June 27.)

**HOVE:** Every Thursday at 44, Hogarth Road, Hove.

**HUDDERSFIELD:** 1st and 3rd Wednesday and last Monday at the Public Library, Ramsden Street.

**HULL:** Alternate Tuesdays at 281, Hessele Road. (July 3.)

**ILFORD:** Alternate Tuesdays at the Gants Hill Library. (June 26.)

**IPSWICH:** Alternate Thursdays at the Art Gallery, High Street. (June 21.)

**JARROW:** Alternate Mondays at Jarrow Central School. (July 2.)

**JERSEY:** 1st and 3rd Mondays at "Santa Barbaba" Maufant, St. Saviour.

**KEIGHLEY:** Alternate Wednesdays at the Spencer Street School Rooms. (June 27.)

**KETERING:** 2nd and 4th Wednesdays at the Rising Sun, Silver Street.

**KIDDERMINSTER:** Alternate Wednesdays at the NFU Meeting Room. (June 20.)

**LEEDS:** Alternate Fridays at 21, Wade Lane, Leeds 1. (June 22.)

**LEICESTER:** Alternate Thursdays at the Leicester Museum. (June 28.)

**LUTON:** 2nd and 4th Tuesdays at Flowers Recreation Club, Park West, Luton.

**MAIDSTONE:** Every Wednesday at the Ex-Service Club, Ashford Road.

**MANCHESTER:** Every Saturday, 6 p.m., at 20, Naylor Street, Hulme, Manchester 15.

**MEDWAY:** Every Monday at 23, Edward's Close, Wigmore, Gillingham.

**MIDDLESBROUGH:** Every Wednesday and Friday at 130, Newport Road.

**MIDDLETON:** Every Thursday at Tonge School, Oldham Road.

**MILLOW:** Every Wednesday at Millom Centre.

**NORTHAMPTON:** Every Tuesday at the Peacock Room, Grand Hotel.

**NOTTINGHAM:** Alternate Thursdays at the Co-operative Educational Centre, Heathcote Street. (June 28.)

**NORWICH:** 4th Tuesday at "Lady Chamberlin Hall," 38a, St. Giles' Street.

**PETERBOROUGH:** Alternate Thursdays at The Youth Centre.

**PONTYPOOL:** Every Monday at the Hospitality Inn, Crumlin Road.

**PLYMOUTH:** Alternate Wednesdays at Virginia House, Plymouth. (June 27.)

**READING:** Every Monday at Abbey Gateway.

**REDDITCH:** 4th Thursday at The White Hart Hotel, Headless Cross.

**RHYL:** Alternate Tuesdays at Studio A, Bedford Street. (July 3.)

**ROTHERHAM:** Alternate Thursdays at St. John's Church Hall, Masbro'. (June 28.)

**RUGBY:** Alternate Thursdays at the Red Lion, Sheep Street. (June 28.)

**SHEERNESS:** Alternate Fridays at Arthur Gisby's, 136, High Street. (June 22.)

**SOUTHALL:** Every Monday at Southall Community Centre.

**SOUTHAMPTON:** Alternate Mondays at Prospect House, 8, Manchester Street. (July 2.)

**SOUTH DEVON:** Alternate Wednesdays at the YMCA, Castle Circus, Torquay. (June 20.)

**STAFFORD:** Alternate Tuesdays at The Grapes, Bridge Street. (June 26.)

**STEVENAGE:** 1st and 3rd Tuesdays at the Tenants' Meeting Room, Marymead.

**STOCKPORT:** 1st and 3rd Fridays at Stockport Boys' Club, Hempsshaw Lane.

**SWANSEA:** Every Thursday at the YMCA Buildings, St. Helen's Road.

**WURRO:** Last Wednesday at the London Inn, Pydar Street.

**URMSTON:** Alternate Thursdays at Davyhulme Scout Hut, Barton Road. (June 21.)

**WALSALL:** Every Wednesday at the New Inn, John Street.

**WARWICK & LEAMINGTON:** 1st and 3rd Wednesdays in Room 18 of the Royal Leamington Spa Town Hall.

**WEST HERTS:** Fortnightly alternating at the Cookery Nook, High Street, Watford. (June 27.)

**HEATH PARK HOTEL, Hemel Hempstead. (July 11.)**

**WEST MIDDLESEX:** 2nd and 4th Thursdays at Dormers Wells Primary School, Dormers Wells Lane, Southall.

**WEST WALES:** 1st and 3rd Fridays at The Meeting House, New Street, Aberystwyth.

**WEYMOUTH:** Alternate Wednesdays at The Waverley Hotel, Abbotshury Road. (June 27.)

**WHITSTABLE:** Alternate Mondays at The Granary, 1, Borstal Hill. (July 2.)

**WINDSOR:** Every Thursday at The Guildhall.

**YEOVIL:** Alternate Thursdays at the Mermaid Hotel, Princess Street. (June 28.)

**YORK:** Every Thursday at 62, Micklegate.

## LONDON

**ACTON:** Alternate Fridays at the King's Head, Acton High Street. (June 22.)

**BETHNAL GREEN:** Every Friday at Shoreditch Tabernacle, Hackney Road, E.2.

**BRIXTON:** Every Tuesday at The White Horse, 94, Brixton Hill, S.W.2.

**CATFORD:** Every Thursday at the Black Horse, Rushey Green, Catford, S.E.6.

**FRIERN BARNET:** 2nd Friday at 7, Harmsworth Way, N.20, and 4th Thursday at 146, Friern Barnet Lane, N.20.

**LEYTONSTONE:** Alternate Wednesdays at Harrow Green Library, London, E.11. (June 27.)

**LONDON:** 2nd Thursday at the Marquis of Granby, Chandos Place, Charing Cross, W.C.2.

**NORTH LONDON:** Every Wednesday at Bush Hill Park School, Main Avenue, Enfield.

**SOUTH-WEST LONDON:** Every Wednesday at Mayfield School, West Hill, S.W.15.

**STOKE NEWINGTON:** Every Wednesday at 53, Londesborough Road, N.16.

**TUFNELL PARK:** Details of meetings from G. Wilgrove, 38, Highgate Road, N.W.5.

**WALTHAMSTOW:** Alternate Fridays at 22, Orford Road, E.17. (June 22.)

**WOOLWICH:** Alternate Mondays at the North Kent Tavern, Spray Street, Woolwich. (July 2.)

Unless otherwise stated, meetings start between 7 and 8 p.m.

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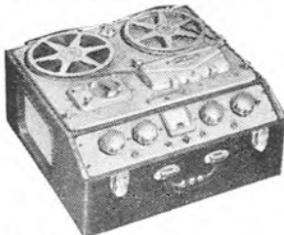
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**Output Power:** 6 watt, can drive larger size extension speaker up to 12 in. Self-contained speaker is 6 1/2 in. in diameter.  
**7 in. Reel Capacity:** Accepts 3 in. and 5 in. reels as well.  
**Level meter:** with pilot lamp for easier determination of correct volume control setting when recording.  
**Index (Revolution) Counter.**  
**Instant Stop Control:** Spot editing and momentary stops are easily accomplished by use of the instant Stop Lever.  
**Monitoring and better reproduction:** Monitoring of your recording may be accomplished by plugging a crystal earphone into the recorder's Output Jack. Superb reproduction can be obtained by operating a large Hi-Fi speaker direct from the Output Jack. Also your existing power-amplifier that does not have a pre-amplifier of its own may be driven from the same Jack.

**Head Output and three position Power Switch:** If desired, the tape transport mechanism (tape deck) of the recorder can be operated independently of the built-in amplifier and speaker. The Head Output Jack and the three-position Power Switch are provided to make this special function possible.

Retails at 79 GNS.



### MODEL M6

Records and plays back either 4-track stereophonically or 4-track monophonically and also plays back 2-track prerecorded stereo tapes. Hysteresis Synchronous Motor always ensures constant tape speed. Designed for vertical or horizontal operation. Two inline and accurate V.U.-Meters reads recording and playback levels.

A precision Index Counter. Recording/play head consists of specially treated core-materials which are being imported from West Germany. Maximum output power of the built-in amplifier is 6 watt on each channel (total 12 watt) which can drive up to 12 in. extension speaker system. Dual Head and Preamp Outlets are provided for connection direct to any other pre-amplifiers or stereophonic amplifier.

Instant Stop Lever. All operating controls are interlocked. Automatic stop device.

The pinch wheel is always automatically released from capstan which protects it against a "spot" on the soft rubber surface causing uneven running.

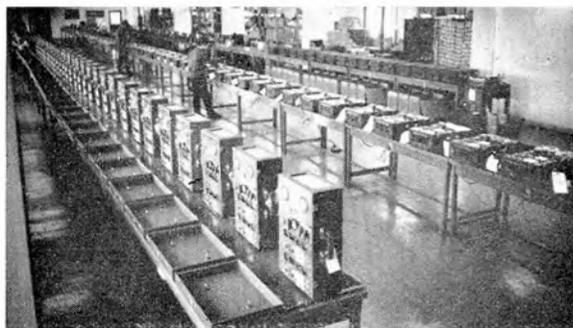
Retails at 130 GNS.

### HI-FI WIDE RANGE STEREO SPEAKER SYSTEM MODEL SS-50

Matched with the Model M-6 in styling and size, complete with connecting cables.

Speakers: Two 8-inch mechanical 2-way (with built-in coaxial tweeter) speakers in a dividable carrying case.

Retails at 30 GNS



Akai's new modern factory in Japan, where the finest equipment is produced under the most up-to-date conditions.

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\*Due to trade agreements Akai are sold under the name of Roberts in the U.S.A.

For descriptive literature and full information of the Akai Terecorders contact your usual dealer or **NORTHGATE (CAMERAS) LIMITED**, 119/125 Wardour Street, London, W.1  
 Tel.: GERard 7030, 7038, 7939.

# Pure Bass

in  
small  
space

## MODEL W2

A really compact loudspeaker system giving full range performance on mono and stereo.

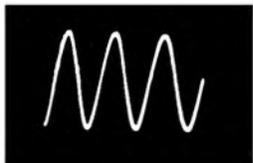
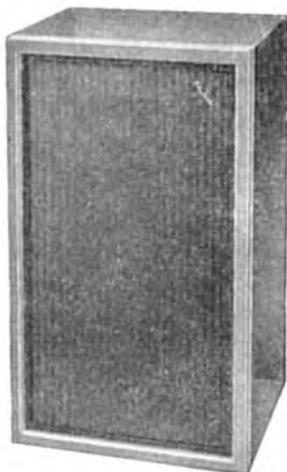
**SIZE:**  
23½" × 14" × 12"

**WEIGHT:**  
37 lb. complete.

**FREQUENCY RANGE:**  
30—17,000 c/s.

**MAX. POWER:**  
15 watts.

**IMPEDANCE:**  
15 ohms.



£27.10.0 in whitewood,  
£29.10.0 fully finished  
with a choice of oak,  
walnut or mahogany  
veneers.

As the waveform shows, the enclosure gives distortion-free performance down to 30 c/s with 4 watts input.

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**The BUTOBA**

MODEL MT 5  
**69 GNS**

including 5"  
tape, connect-  
ing lead and moving  
coil micro-  
phone.



*"The Butoba looks so good, is so cleverly designed, performs so well, that your reviewer had to be firm with himself to keep his superlatives within bounds."*

\* Mr. John Borwick,  
Technical Editor of a leading tape  
recording magazine.

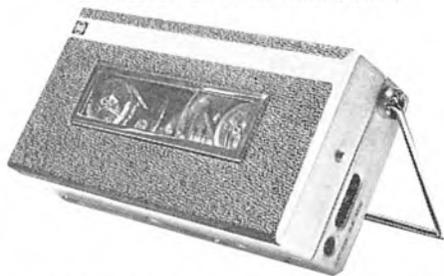
- Two speeds, 3¾ and 1½, with frequency response of 50 to 13,000 cycles at 3¾ ips, giving true mains machine high fidelity.
- Very high quality playback through large-sized 7" × 5" internal speaker, with full 1.2 watts output (not just milli-watts).
- Adjustable Treble Control operative on playback and record, giving high fidelity from widely different sound-sources.
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- High sensitivity level—no lack of gain with this machine.
- Very low background noise level—lower than many mains machines 40 dB.
- Playback through radio or amplifier, with or without recorder's speaker operating.
- "Buy-anywhere" normal flashlight U2 batteries—not special radio-type batteries. Life up to 50 hours with standard cells.
- 5" reels of tape can be used, giving more than four hours with d.p. tape.
- Mains converter for home use.
- Prompt service facilities.
- Designed and engineered by an old-established firm which for years has produced precision clocks and watches, then clock-work tape recorders, and now, for the last five years, all-battery recorders. This valuable experience has culminated in the unique Butoba MT 5.

Send for full details of the machine and accessories to:

**DENHAM & MORLEY LTD**

Denmore House, 173-175 Cleveland Street,  
London, W. I. Tel. EUSTon 3656-7

MAGIC IN MINIATURE!



DONALD ALDOUS says: "Highly commended for its purpose." ("Audio and Record Review," October 1961)

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WITH ALL THESE FEATURES:

1-touch Push Button Controls; 2 1/2 in. diameter built-in Speaker; 3 1/2 in. Standard Spools; Double Track Recording; 2 Speeds—3 1/2 and 1 1/2 i.p.s.; Size 7 1/2 in. x 3 1/2 in. x 2 1/2 in.; Weighs only 3 lb. Powered by 5 pen cells (Ever Ready D14 or U7). Mains Adaptor available.

INDISPENSABLE FOR OUTDOOR RECORDING!

MODEL PT4-H (With Camera Release Remote Control). Hand Rewind, £43 10s.

MODEL PT4-K "Kari-Korder" Power Rewind. Microphone Remote Control. 49 gns.

Both supplied complete with Microphone, Earphone, Telephone Pickup, Radio Cord, Tape, Batteries, Leather Case and Shoulder Strap, Splicing Tape, Polishing Cloth and Instruction Book. Foot Switch for PT4-K optional extra.

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*Telefunken 85KL	79 gns.
*Telefunken 95	59 gns.
*Telefunken 96 4 Tr.	69 gns.
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