

JUNE 1963

TAPE

RECORDING MAGAZINE

1/6



IN THIS ISSUE

- Special survey of battery portable recorders of all available models
- Tabulated catalogue of all available models
- Test Bench reports on three battery machines
- Making a competition tape
- New Products
- Club news
- Reviews of the latest tape record releases

ANNOUNCING

TWO NEW TAPE RECORDERS FROM BRENELL



FOR STEREO

THE STB 1

This new stereo tape recorder from Brenell contains many new features which will appeal to the discriminating amateur and professional alike. It is beautifully designed both mechanically and electrically and incorporates twin recording and twin replay pre-amplifiers, designed for use with existing high fidelity amplifying equipment. Some idea of the versatility of this new machine will be gathered from this very brief specification:—

4 speeds, $1\frac{7}{8}$, $3\frac{3}{4}$, $7\frac{1}{2}$ and 15 i.p.s.—mixing—superimposing—sound-on-sound—immediate comparison of original and recorded signals—2 edgewise meters—replay facilities for $\frac{1}{2}$, $2/2$, $\frac{1}{4}$ and $2/4$ track pre-recorded tapes.

£120



FOR MONO

THE MARK 5 Series 2

This new machine replaces the MARK 5 and offers a number of improvements both in appearance and electrically. The cabinet is finished in dark grey with chrome trim and the deck and amplifier have light grey masks giving the whole machine a very pleasing appearance. The amplifier has been redesigned to give an improved frequency response at all speeds on both record and playback. The output remains the same at 4 watts.

Specification

4 speeds, $1\frac{7}{8}$, $3\frac{3}{4}$, $7\frac{1}{2}$ and 15 i.p.s.—3 independent motors (synchronous drive to capstan motor)—instant stop without spillage—pause control—monitoring—superimposing—up to $8\frac{1}{2}$ in. reels—fast rewind (1,200 ft. in 45 seconds).

69 gns



and we continue

THE MARK 5 Type M

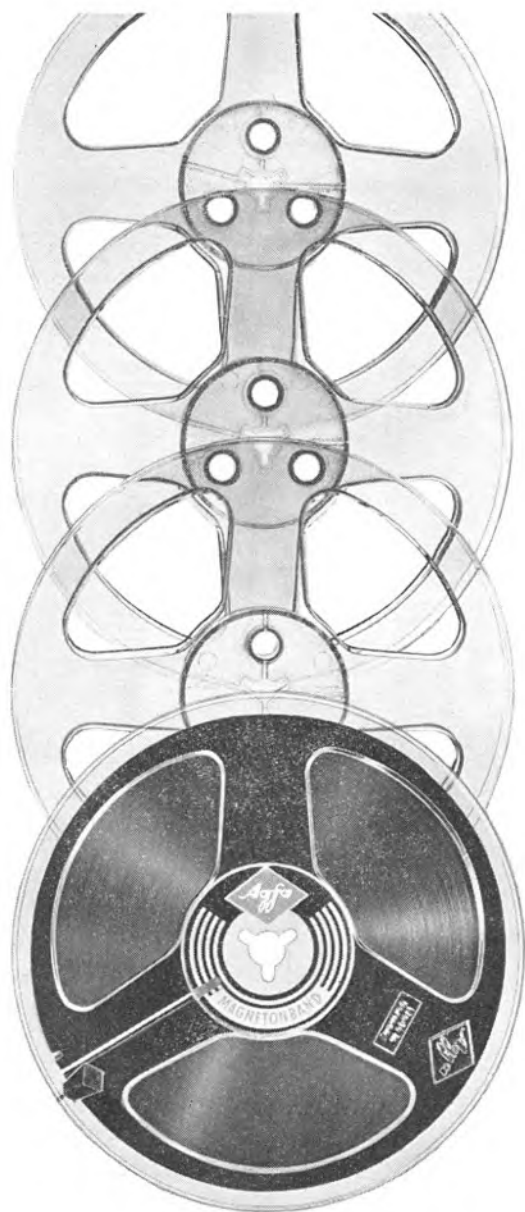
A high-class, semi-professional machine, the Type M has earned itself an enviable reputation for quality and reliability. Its superb finish and performance will match any high fidelity equipment which is available today—just consider this brief specification:—

4 speeds, $1\frac{7}{8}$, $3\frac{3}{4}$, $7\frac{1}{2}$ and 15 i.p.s.—separate record and replay heads and amplifiers—reels up to $8\frac{1}{2}$ in. dia.—fast rewind (1,200 ft. in 45 seconds)—mixing—superimposing—recording level meter—adjustable rotary tape guide.

88 gns

Brenell

BRENELL ENGINEERING COMPANY LIMITED
1a Doughty Street, London, W.C.1. HOLborn 7356 (3 lines)



**three
into
one**

TRIPLE PLAY PE 65 TAPE

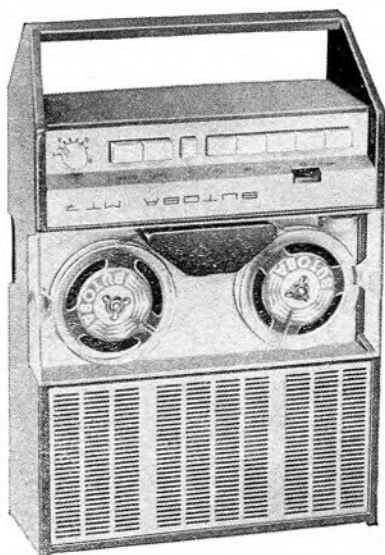
- * That lengthy opera can be recorded on a single spool without change of track.
- * Your battery recorder will play for three times as long.
- * Agfa triple play tape will not stretch, or break because it is pre-stressed during manufacture.



PE 65 tape available on 3 · 4 · 4 $\frac{1}{4}$ · 5 · 5 $\frac{3}{4}$ & 7 inch spools
27 REGENT STREET LONDON SW1 · REGENT 8581

Pick of the **WORLD'S** best!..

The leading portable TAPE RECORDERS



BUTOBA MT7 & MT7R

Battery operated with Mains performance

If you're looking for a multi-purpose tape recorder buy a "Butoba." This range of battery operated machines is outstanding for purity of reproduction and is ideal for recording music, speech and bird-song. Easily transportable, "Butoba" will help to make your holiday memorable. You can have the music of your choice wherever you go and, together with your camera, you can bring home tapes which have captured forever the sounds and scenes you have selected to record. The "Butoba" is truly economical on batteries and there is a mains converter available for home use. High Fidelity range 6 in. oval speaker. Good output. (1 watt.) The MT7R is available with remote control facilities, ideal for dictation in office or car.

The prices of the range are attractive

Model MT7 44 gns. MT7R 49 gns. MT5 66 gns.

Please send me details of BUTOBA Tape Recorders.

I am interested in Model No.....

Name.....

Address.....



DENHAM & MORLEY LTD.

Denmore House, 173-175 Cleveland Street,
London, W.1. Tel.: EUSon 3656-7

TAPE RECORDER COVERS



Smart, waterproof cover to give complete protection to your tape recorder. Made from rubberised canvas in navy, wine, tan, grey and bottle green with white contrasting pipings, reinforced base, handy zip microphone pocket and name panel.

Cossor 1602	...	57/6
" 1601	...	63/-
Stella ST455	...	63/-
" ST454	...	57/6
Saja MK.5	...	57/6
Suzzl Tricorder	...	58/-
Saba	...	63/-
Wyndor Viscount	...	55/-*
" Victor	...	60/-*
Elizabethan Princess	...	60/-
" Avon	...	60/-
" Escort	...	57/6*
" Major	...	63/-
" FT.1	...	66/-
" FT.3	...	+
Fi-Cord	...	52/6
Korting (4 track stereo)	...	63/-
Harting Stereo	...	66/-
Fidelity Argyle	...	55/-*
Walter 101	...	55/-
Simon SP4	...	63/-*
Clarion (complete with strap)	...	52/6
Brenell Mk.5	...	77/-
" 3 star	...	69/-
Minivox	...	+

Grundig TK.5	...	55/-
" TK.8	...	63/-
" TK.20	...	52/6
" TK.24	...	55/-
" TK.25	...	55/-
" TK.30	...	60/-
" TK.35	...	63/-
" TK.50	...	60/-
" TK.55	...	63/-
" TK.60	...	75/-*
" TK.830/3D	...	63/-
" Cub	...	35/-
Telefunken 85	...	60/-*
" 85	...	65/-
" 75/15	...	55/-
" 76K	...	55/-
" 77K	...	+
Philips 8108	...	57/6
" 8109	...	63/-
" EL3538	...	63/-
" EL3542	...	63/-
" EL3536	...	70/-*
" EL3515	...	57/6
" EL3541/15	...	57/6

A. BROWN & SONS LTD.

24-28, GEORGE STREET, HULL

Tel: 25413, 25412

MASSEYS CENTRE of SOUND

proudly present the opening at

CHISWICK W.4 of WEST LONDON'S NEWEST HI-FI & TAPE RECORDER CENTRE

(Leak, Quad, Pye, Rogers, Garrard, Armstrong, Goodmans, Ferrograph, Sony, Tandberg, Grundig, etc., etc.)

Pre-Recorded Tapes Mono/Stereo Accessories of ALL Types; Specially Built Dem. Room with Comparator

— PERSONAL SUPERVISION —

Fully Equipped Workshops for all Servicing

(Early Closing) 10 a.m. — 7 p.m. (Not Closed) (Thursdays) For Lunch

**121 - 123, HIGH ROAD,
CHISWICK W.4**

CHISwick 2082

Alive to every sound



Like the ears of this wary fox, the Gramplan DP4 microphone is sensitive to an extremely wide range of sounds. With its uniform frequency response from 50 to 15,000 c/s, the reliable, medium-priced DP4 will greatly improve the standard of your recordings.

Gramplan DP4

—also for broadcasting, public address and call systems.

Low impedance microphone, complete with connector and 18 ft. screened lead **£8. 0. 0.**
Medium and high impedance models . . . **£9. 0. 0.**

A complete range of stands, swivel holders, reflectors and other accessories is available.

GRAMPIAN—sounds like the real thing!

Write or phone for illustrated leaflets:



GRAMPIAN REPRODUCERS LTD

Hanworth Trading Estate, Feltham, Middlesex. Feltham 2657



ONLY A PILLAR-BOX AWAY . . .

Wherever you live, you are only the nearest pillar-box from the biggest Tape Recorder dealers in the British Isles—

HOWARD OF BROMLEY

Thinking of buying a Tape Recorder, Hi-Fi Equipment or a Camera? Willing to risk 3d. to see if we really do offer you better terms than anyone else? Then contact us for full details of all our offers (which includes INTEREST FREE H.P. on most makes) and free brochures, etc.

If we do not convince you, you will only have lost 3d. and you can still go elsewhere. (But we bet you won't!)

WRITE, PHONE, CALL IN OR SEND CARRIER PIGEON:

**218 HIGH ST
BROMLEY
KENT**

**RAVensbourne
4000 & 4477**

HOWARD TAPE RECORDERS

FRANCIS OF STREATHAM

Akai M6 Stereo	30 gns.	*Telefunken 85KL de	82 gns.
Akai M69	79 gns.	luxa	59 gns.
*Brenell Mk. V. Model M	88 gns.	*Telefunken 95	69 gns.
*Brenell Mk. V	64 gns.	*Telefunken 96 4 Tr. ...	95 gns.
Cossor 4 Tr. 1602	38 gns.	*Telefunken 97 Stereo ...	95 gns.
Cossor 4 Tr. 1605	62 gns.	*Telefunken 98 Stereo ...	39 gns.
Cossor 4 Tr. 1603	28 gns.	Truvox Series 60, 1/2 & 1/4 Tr.	55 gns.
Elizabethan Popular ...	24 gns.	Truvox Series 80/2 Tr. ...	59 gns.
Elizabethan LZ. 30	32 gns.	Truvox Series 80/4 Tr. ...	82 gns.
Ferguson 3200	26 gns.	Uher Universal	£93.13.0
Ferguson 3202 2Sp 4Tr ...	33 gns.	*Vortexion WVA	£110.3.0
*Ferrograph Series V ...	85 gns.	*Vortexion C Stereo ...	£148.10.0
*Ferrograph 422 or 424 ...	110 gns.	*Vortexion CBL	£160
Fidelity Argyll Minor ...	22 gns.	*Wyndor International ...	69 gns.
Grundig TK14	35 gns.		
Grundig TK23	45 gns.		
Grundig TK40	75 gns.		
Grundig TK41	75 gns.		
Grundig TK46 Stereo ...	99 gns.		
Loewe Opta 403 2Sp	45 gns.		
Loewe Opta 404	53 gns.		
Philips 4 Tr. 3514	27 gns.		
Philips 4 Tr. 3541	36 gns.		
Philips 4 Tr. 3549	62 gns.		
Philips new 4 Tr. Stereo	92 gns.		
*Reflectograph 'A' 1/2 Tr.	105 gns.		
Robuk	36 gns.		
*Simon SP5	93 gns.		
Sony Stereo 464	75 gns.		
Sony 1/2 and 1/4 Track 521 ...	124 gns.		
Stellaphon 4 Tr. 456	28 gns.		
Stellaphon 4 Tr. 454	38 gns.		
Stellaphon 4 Tr. 459	62 gns.		
Stuzzi 4 Tr. Junior	26 gns.		
*Tandberg Series VI			
Stereo 1/2 or 1/4 Tr. ...	110 gns.		
*Tandberg Series 7	93 gns.		

BATTERY PORTABLES

Philips Portable	24 gns.
*Butoba	66 gns.
Grundig TK1	29 gns.
Clarion Phonotrix	39 gns.
Fi-Cord 202	66 gns.
Stella	25 gns.
Stuzzi Memo-Cord	25 gns.
Optacord 412 Batt/Mains	47 gns.
Uher 4000	93 gns.
Cossor	25 gns.

*Microphone extra

Mains Power Pack for Philips or Stella £5.0.0

TRUVOX Decks with Pre-Amps
 PD 82—Standard Twin Tr. £42.0.0
 PD 85—Professional 4 Tr. £52.10.0
 PD 86—Professional 4 Tr. Stereo £63.0.0
 Decks also Brenell and Wearite

LEADING STOCKISTS OF EQUIPMENT FOR TAPE and HI-FI

... and NO EXTRA FOR CREDIT TERMS

- ★ Minimum Deposit
- ★ No Interest or Service Charges on H.P. up to 18 months
- ★ Free Service during Guarantee Period

Prices subject to alteration as announced by manufacturers

- Grampian Reflector... £5.15.0
- MICROPHONES & MIXERS
 Grampian Ribbon GR102 £10.15.0
 Grampian DP/4 Dynamic £8.0.0
 Lustraphone VR/70 Miniature Ribbon ... 10 gns.
 Lustraphone Ribbon ... £7.17.6
 Lustraphone LFV/59 Dynamic £8.18.6
 Simon "Cadenza" Ribbon £10.10.0
 Reslo Ribbon or Dynamic £12.6
 Reslo Cardioid £9.12.6
 Reslo Pencil Ribbon £8.0.0
 A.K.G. Stereo D.88 ... £19.19.0
 A.K.G. K.50 Headphones £7.10.0
 Grundig Mixer £16.16.0
 Microphones by ACOS, and TELEFUNKEN All Walgain Products. Brenell and Philips mixers.
- TAPES & ACCESSORIES
 Standard, Double Play, Long Play and Triple Play in all sizes by all leading makers.
- Pre-recorded Tapes by Columbia, H.M.V., Saga, Music on Tape, etc. Bib, Bond and Romagna splicers. Matching transformers. Plugs, sockets, etc.
- Defluxers by Walgain, Wearite.

HI-FI DEPT.

- STEREO AND MONO AMPLIFIERS by
 Quad Scott Chapman
 Tripletone Walgain Leak
 Rogers Armstrong B. & O.
- TUNERS by
 Quad Rogers Chapman
 Leak Armstrong Pye
- LOUDSPEAKERS by
 Quad Philips
 W.B. Wharfedale
 Goodmans Tannoy
 Leak Lowther
 Kef
- MOTORS, PICKUPS, by
 Garrard Tannoy
 Goldring-Lenco Connoisseur
 Shure Decca 'Deram'
 Stereo Ronette
 Philips SME
 B & O Thorens

All types of Diamond and Sapphire styli, stereo and mono. Microlifts, Garrard SPG3, Acos Dust Bag.

- CABINETS Record Housing Design Furniture

Please note our only address as below

169-173 STREATHAM HIGH ROAD, LONDON, S.W.16

Between St. Leonard's Church and Streatham Station

STreatham 0446/0192

We offer a wide range of over 30 different models



including: Radios, Speakers, Amplifiers and Test instruments.

Save Money Building Your own Equipment!



TA-IS

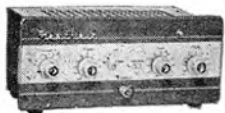
TAPE AMPLIFIER UNITS: Models TA-IM and TA-IS. The mono version, TA-IM, can be modified to the stereo version, TA-IS, by the modification kit TA-IC. Special features include bias level control, recording level indicators, printed circuit boards.

TA-IC £6.15.0. TA-IM £19.2.6. TA-IS £24.10.0.

HI-FI STEREO 6 W AMPLIFIER Model S-33
 Only 0.3% distortion at 2 1/2 w/chl. £13.7.6.

DE-LUXE STEREO AMPLIFIER Model S-33H

De-luxe version of the S-33 with two tone grey perspex panel. With higher sensitivity necessary to accept the Decca Deram pick up. £15.17.6.



S-33

HI-FI STEREO 18W AMPLIFIER Model S-99
 Within its power rating, this handsome looking amplifier is the finest available. U/L push-pull output. Printed circuit board construction. £27.19.6.



S-99

HI-FI FM TUNER Model FM-4U
 Available in two units. Tuning unit (FMT-4U £2.15.0 incl. P.T.). I.F.-amplifier (FMA-4U £12.6.0). Printed circuit for I.F. Amplifier and Ratio detector own built-in power supply, 7 valves. Tuning range, 88-108 Mc/s. Total price £15.1.0.

HI-FI AM/FM TUNER. Model AFM-1.
 Also available in two units as above: Tuning heart (AFM-TI £4.13.6 incl. P.T.) and I.F. amplifier (AFM-AI £20.13.0.). Total £25.6.6.



AM/FM TUNER

We guarantee that without any previous experience—you can build any of our models.



MALVERN

EQUIPMENT CABINETS

A range of equipment cabinets is available including kits, ready assembled cabinets or assembled and fully finished cabinets. Why not send for full details free of any obligation?

Prices from £6.19.6. to £29.8.0.

TRUVOX TAPE DECKS.

Models D-83-D84

High quality mono/stereo Tape Decks.

D83 2 track for higher fidelity £31.10.0.

D84 (identical presentation) 4 track. £29.8.0.



TRUVOX D83

COTSWOLD & MFS SPEAKER SYSTEMS

The "Cotswold" is an acoustically designed enclosure 26" x 23" x 14 1/2" with 3 speakers covering the full frequency range 30-20,000 c/s. The "Cotswold" MFS. A minimum floor space model size 36" high x 16 1/2" x 14" deep. Price either model £23.4.0.

COLLARO "STUDIO" TAPE DECK

This stylish tape transistor is by far the best "buy" in its price range, with 3 speeds 1 1/2, 3 1/2, 7 1/2 i.p.s. £17.10.0.



COTSWOLD

Without obligation please send me

FREE BRITISH HEATHKIT CATALOGUE

Full details of Model(s)

Name

Address

(Block capitals please)

TI.

All prices include free delivery in the UK. Deferred terms available on orders over £10.

ALL MODELS AVAILABLE ASSEMBLED—PRICES ON REQUEST

DAYSTROM LTD.

Dept. TI
 Gloucester, England.

for Professional Performance... **Tandberg**

SERIES 6

STEREO TAPE DECK



3 SPEEDS
3 HEADS
4 AMPLIFIERS
***4 TRACK and 2 TRACK**

- High and low level mixer inputs and cathode follower outputs.
- "On and off the Tape" monitoring.
- Sound-on-Sound simultaneous record and playback.

110 gns

Booklet of Technical Reviews on request.

SERIES 7

STEREO TAPE RECORDER



3 SPEEDS
2 HEADS
 and 2 Power Amplifiers

- Two Indicators.
- Two Monitor Speakers.
- Two outputs for additional speakers or Hi-Fi.

***4 TRACK and 2 TRACK**

Send for leaflet.

BUILD-IT-IN OR CARRY-IT-AROUND!

93 gns

4 track model 74
 2 track model 72
 (Luggage type carrying case. £7 1s 8d. extra).

Tandberg GB

ELSTONE ELECTRONICS LIMITED,
 Edward St., Templar St., Leeds 2.
 Telephone: Leeds 3-5111 (7 lines)



LOEWE OPTA

Hi-Fi Tape Recorders

FOR PERFECTION IN SOUND

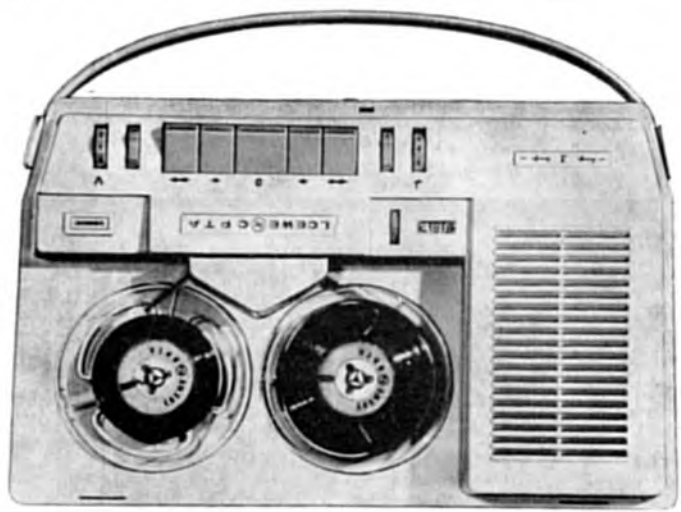
THE LATEST ADDITION TO THE OPTACORD RANGE

OPTACORD 414

With the first-ever high frequency motor ensuring long life and constant speeds. Unsurpassed for a portable tape recorder. For use on mains, batteries and car batteries.

47 Gns.

Ask our Representative to call, or see the complete range at our Showrooms



HIGHGATE ACOUSTICS

71/73, GT. PORTLAND STREET, LONDON, W.1 Telephone: MUSEum 2901/6



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 • Extension speaker socket • Low and medium input sockets • Socket for remote control • Safety record switch • Easy-load battery cassettes • 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 professional and equally for the enthusiastic amateur demanding the highest professional standards. It incorporates all the practical advantages 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

GRUNDIG TK60



**S
T
E
R
E
O**

SPECIAL OFFER!!

We have a number of the fabulous TK60 STEREO TAPE RECORDERS available at the fantastic price of 89 gns. This recorder is listed at £134 and at the price offered shows a saving of over £40! Absolutely complete in the last detail with two superb detachable acoustically designed speakers, 9 watts output, Frequency response 50-16,000 c/s Bass and Treble controls, automatic tape stops, etc. Superb value and an absolutely unrepeatable offer, BRAND NEW in sealed cartons with full makers' guarantee. Hire Purchase terms available. We specialize in mail order. Write to our HEAD OFFICE at Stratford—address below.

- ★ HIGHEST PART-EXCHANGE ALLOWANCES
- ★ OVER 250 NEW & S/H RECORDERS ON DISPLAY
- ★ H.P. TERMS OVER 9-24 MONTHS
- ★ FREE HOME DEMONSTRATIONS
- ★ TAPE RECORDER REPAIR SPECIALISTS
- ★ FREE DELIVERY, FREE TECHNICAL ADVICE

NOTE—OUR CITY SHOP CLOSED SAT. OPEN MON.-FRI. 9-6 p.m. SUN. 9-2 p.m.

CITY & ESSEX
T A P E
RECORDER CENTRES

228 BISHOPSGATE, E.C.2 (opp. Liverpool St. Station) BIS 2609
 2 MARYLAND STATION, STRATFORD, E.15 (adj. station) MAR 5879
 205 HIGH STREET NORTH, E.6 (opp. East Ham Station) GRA 6543

TAPE

RECORDING
MAGAZINE

Vol. 7 No. 6 June 1963

IN THIS ISSUE

The Editorial View . . .	10
Making a competition tape	11
Reginald Bonney	
Battery portable round-up	12
A catalogue of models	
Portables on parade	13
H. Burrell Hadden	
Three models examined	18
Uher 4000S Report ; Hitachi	
TRQ 399 ; Cossor CR 1620	
A case for the Grundig TKI	22
A do-it-yourself feature	
Recording linguistic fossils	24
A. C. Wilson	
Tape records reviewed	26
Edward Greenfield	
Popular music on tape	27
Don Wedge	
New Products	28
News from the clubs	31
Tape Exchanges	33

COVER PHOTOGRAPH: The Nagra IIIb battery portable tape recorder illustrated this month, is being used by a Livingston Recordings Ltd. engineer for "out and about" interviews. Its portability and ease of handling makes it particularly suitable for this type of application. An automatic volume control circuit, which can be switched in, ensures that recording levels remain reasonably constant, irrespective of distance from microphone.

In the photograph, the engineer is making use of a directional microphone to reduce ambient noise which would otherwise be amplified by the automatic level system.

"TAPE Recording Magazine" is published on the third Wednesday in the month, by Print and Press Services Ltd., from 7, Tudor Street, London, E.C.4.

"TAPE Recording Magazine" is available by a postal subscription of 20s. per annum (U.S.A. \$3.50) including postage, or it can be obtained at newsagents, bookstalls and radio and music dealers. In the event of difficulty, write to the Publishers at 7, Tudor Street, London, E.C.4.

Back numbers, if still in print, are available at 2s. 6d. per copy for issues up to November 1959, and 2s. per copy for later numbers.

Address all communications
 7 TUDOR STREET, LONDON, E.C.4 FLE 1455

EDITORIAL

ADVERTISING

Editor,
 R. DOUGLAS BROWN
 Assistant Editor, FRED CHANDLER

Advertisement Manager,
 MISS PAMELA DURHAM

Tape trends and tape talk

By the Editor

THE AUDIO FESTIVAL and Fair was an undoubted success—and it has established its new status as an international event, in fact, as *the* international event in the world of audio. One of the most remarkable features this year was the attendance of 1,600 overseas visitors on the opening day. I talked to a representative selection of them—from Europe, America and Asia—and I assure you they were impressed.

The British enthusiast, as usual, turned out in such numbers that the Russell Hotel was packed tight. I heard some discussion of the possibility of moving the event into bigger premises; there are considerable problems. If one of London's recognised exhibition halls was used, it would involve the construction of special sound-proofed listening rooms. This would be expensive. If the cost could be spread over several years, by devising a unit principle of construction, so that re-erection was made simple, the problems could doubtless be solved.

We know how many enthusiasts turn up each year at the Audio Festival. How many others might be tempted in if the event were expanded or extended further?

I should like to see a one-day extension of the period of opening next year, with the additional day set aside for those prepared to pay for the privilege of examining and listening to equipment in less crowded conditions.

Helping linguists

IT WAS SIGNIFICANT that the emphasis on language teaching with tape by two or three exhibitors at the Audio Festival coincided with a call by the Incorporated Association of Head Masters (heads of public and grammar schools) for more "language laboratories."

There are now available simple and relatively inexpensive units which should be within range of education committees. We have been lagging far behind other countries. It looks as if the old saying that

the British make bad linguists is simply a way of camouflaging the truth that we are just not interested in learning to communicate with other nations.

As I have mentioned, I talked at Audio Fair to representatives of many overseas firms and all spoke perfect English. Unless *our* salesmen speak perfectly the languages of the countries where they seek custom, we are going to be pushed out.

At the moment there are only a couple of dozen tape "language laboratories" operating in this country. Every school needs to have one, as the Headmasters' Association argues.

New ideas

THE VALUE OF TAPE in education is thus increasingly recognised. I have recently received a publication of the Department of Education in New Zealand, called "Using the Tape Recorder," in which I find listed two uses which are unfamiliar to me. I pass the ideas on to British school-teachers.

The first is to mark essays by dictating comment on to tape and explaining why correction is necessary. The pupils listen individually to the part of the tape which affects them, with the exercise book open and a pencil in hand.

"This way each child gets individual attention, corrects the errors himself and, most important of all, knows why the error is wrong," comments the teacher who has pioneered this technique. "It really works."

The other idea is an exercise in judgment and discrimination. It involves recording "commercials" from TV and then analysing them. Comments a teacher: "The children find it quite amusing in the calm atmosphere of the school-room and have come to see the difference between facts and opinions. It hasn't stopped them listening to the commercial stations at home, of course, but it has taught them to be cautious."

Calling all schools

AS A POSTSCRIPT to these comments on tape and education, I have promised my good friend Pierre Guérin, the moving spirit in the International School Centre for Sound Correspondence, that I will make a new appeal to British teachers to stimulate tape exchanges.

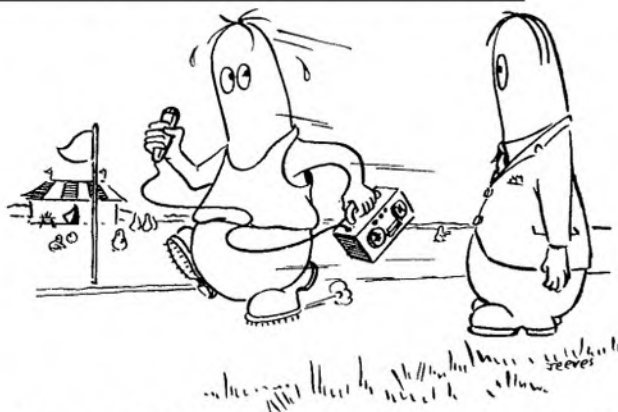
Will any British schools which would care to make an exchange arrangement with a French school contact M. Guérin, at E.P.A. Chanteloup, Sainte Savine, Aube, France?

To start things off, here are details of two schools which are anxious to establish an association with British schools as soon as possible:

College d'enseignement general, Caraman, Ht. Garonne, France—M. Raymond Beauville wishes to arrange an exchange of written correspondence, tape messages and (if possible) of students with a boys' school in Britain. The college has a 4-track Philips recorder, with a speed of 3½ ips.

Madame Madeleine Frerot, 57, rue de Lion, Caen, Calvados, France, wishes to arrange an exchange of recordings with a girls' secondary school in England, Scotland, or Ireland. Her pupils are aged 11 to 15. They have a single-track recorder operating at 3½ and 7½ ips, but they can cope with two-track recordings.

LAUGH WITH JEEVES



'I was asked to record a running commentary'

This royal occasion made a fine documentary

By REGINALD BONNEY

THE annual Trooping of the Colour on the Queen's birthday is one of London's most spectacular events and one which I felt I must get on to tape.

Unfortunately, I was not able to record the actual ceremony itself because it is a "ticket only" event. I decided, therefore, to concentrate on events leading up to the Trooping—the troops, bands, processions and so forth.

The morning of the event found me in the Mall with my Stella ST470 Battery Portable, with a new tape in position and a spare one in my pocket. I had loaded new batteries the previous day and checked them, so I knew I was alright there.

My first move was to check with various officials and police, to obtain information about what would take place and where.

Soon people began to crowd in all along the Mall, so I thought I had better decide where I was going to do my recording. I was undecided whether to stay on the outside of the crowd and make sure of getting a good recording of the bands as they went by and not being quite certain of picking up the sound of the troops marching; or to get right at the front, where I would be close to the marching feet but might not catch the music quite as well. I saw someone with a cine camera with a zoom-lens, and this gave me an idea. Why not use my tape recorder in just the same way as he would use his camera?

The microphone supplied with the Stella ST470 is a semi-cardioid type and

therefore directional. I could use this to catch the sound in the same way as the photographer uses his camera lens to get his picture. Then, in just the same way as a photographer keeps his picture correct by altering his focus, I could keep my sound correct by making the record volume control my focus. This sounded all right, but would it work. Only one way to find out—try it.

I managed to get myself a good position right in front, and fixed my microphone in a temporary sling made from a handkerchief, so that it rested quite comfortably on my chest. This left both my hands free to manipulate my recorder, and I could also focus my microphone on whatever sound I wanted by just facing in that direction.

The first band came along with its detachment of troops behind, and I carried out my camera idea of recording, carefully watching the recording level, keeping it in focus, as it were. By virtue of my position right in front I was able to face right down the Mall, gradually turning as the band came nearer until, with the band away in the distance, I was facing in the opposite direction.

A quick rewind and playback to check that my idea was working, and away I went again, recording five bands, just over eight hundred troops and the passage of several Royal personages.

Playing this back at home I found I had a forty-minute recording of the Procession in the Mall. As I thought about this, I realised I had found my title for the tape—Royal Procession down the Mall.

That was a start anyway, but the main thing was to put together a four-minute tape which would convey some kind of a story of an actual event.

The original tape was dubbed from the Stella on to my mains recorder at 7½ ips to make the editing easier, and then it was, playback—rewind, playback—rewind until I knew that forty-minute tape by heart. I decided not to put a commentary in, but to let the tape tell its own story if I could.

The story was to be in three separate parts—the Introduction, the Actual Event and the Conclusion, each part to run smoothly into the next, with the last part ending, not as is usual in a fade, but loudly and abruptly.

More playback—rewind, playback—rewind, and finally the watch for timing, until at last I was reasonably sure that I had the right parts, which, when strung together would make my tape.

All this so far had just been editing in the mind, and as I had already spent a week on this, I thought I should get down to actually cutting the tape.

The material required only five splices and was completed in one evening. The spliced and edited tape sounded exactly as I had planned, the first part consisting of a military band coming right up from the distance, with the sound of marching footsteps fading away as the second part came in—the words of command for a Royal salute and the slap of the rifles as the troops presented arms. The cheers of the crowd and the sound of the Royal carriage going past were followed by the command to order arms. The third part came in quite smoothly with the clatter of horses' hooves and the sound of the Mounted Band of the Household Cavalry going past to end the tape, as I had intended, on a loud note, in exactly four minutes.

This was my first attempt at making a competition tape, and I must say, that I thoroughly enjoyed it and, what is more, learned quite a lot while doing it.

BRITISH AMATEUR TAPE RECORDING CONTEST 1963

Are you planning and preparing your entry?

The closing date is 28th June, 1963.

This is the big talent-spotting event of the year. If you fancy yourself as a recording engineer, news commentator, scriptwriter, interviewer, producer, or composer—now is your chance to bring your work to the notice of the experts and the public.

If you missed the earlier announcements giving full details, write now for entry form and information to British Amateur Tape Recording Contest, 7, Tudor Street, London, E.C.4, using the coupon on page 33.

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
AIWA TP-30 <i>Connexans Ltd., Westminster Bank Chambers, Bridge Street, Leatherhead, Surrey.</i>	Rim-driven 7½ 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, ear-phones, batteries, carrying strap.
BUTOBA MT5 (Reviewed July 1962) <i>Denham & Marley Ltd., 175, Cleveland Street, London, W.1.</i>	3½, 1½ (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; headphone 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
BUTOBA MT5 "S"	3½, 1½ (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 removable power amplifier stage fitted in battery compartment; and mixing.	£86 2 0
BUTOBA MT7	3½, 1½ (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 M52	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
CADET <i>Dansette Products Ltd., 112-116, Old Street, Clerkenwell, London, E.C.1.</i>	3½, 1½ (2 tracks)	Up to 5,500 at 3½ ips Up to 3,000 at 1½ ips	—	0.2% and 0.3%	RMS	10	11½×5½×12	4 cassette	—	—	50 hrs. approx.	Six 1½V U2 or equivalent.	Magazine-loaded Garrard deck; fully transistorised; magic eye recording level indicator; combined tone control; two inputs one motor.	£27 6 0
COSSOR CR1620 (Reviewed this issue) <i>Cosor Radio & Television Ltd., 233, Tottenham Court Road, London, W.1.</i>	1½ (2 tracks)	120-5,500 ± 3dB	-40dB	0.5%	250mW	8 (inc. batteries).	11½×4½×7½	3 (4 with lid removed).	4 round	Moving-coil cardioid	20 hrs.	Six 1½V U2 or equivalent	Push-button control removable transparent dust cover; recording level indicator/battery life meter combined; safety interlock; three inputs; extension speaker socket; fast rewind; detachable carrying handle; line output for external amplifiers.	£26 5 0
DOKORDER PT-4KB <i>Samuel Lewis (City) Ltd., 200a, Upper Thames Street, London, E.C.4.</i>	3½, 1½ (2 tracks)	200-7,000 at 3½ ips 200-3,500 at 1½ ips	—	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)
E.M.I. Model RE.321 <i>E.M.I., Hayes, Middlesex.</i>	7½ (Full track)	60-10,000 (CCIR)	44dB un-weighted	0.25% (rms)	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
EUMIG T5 <i>Johnson of Hendon Ltd., 335, Hendon Way, London, N.W.4</i>	3½ (2-tracks)	100-9,000	—	—	200 ohms	1½	6½×3½×1½	Cas- sette	—	—	—	Six Penlight dry cells.	Headphone monitoring, pause control; safety erase lock; transistorised straight-through amplification; synchronised	£25 0 0
FI-CORD 202 (Reviewed November 1962) <i>Fi-cord International Ltd., 40a, Dover Street, London, W.1.</i>	7½, 3½ (2 tracks)	50-12,000 and 50-8,000 both ± 3dB	50 dB weighted	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	Mallory ZM 12 Mercury cells.	Battery and mains operation; 12 volt car battery; AC power-pack adaptors	£69 6 0

The accent is on size and price

H. BURRELL HADDEN casts a professional eye over the current range of battery portable recorders, but bears in mind the pocket of the amateur enthusiasts as well.

SOME years ago, the small battery-operated tape recorder was a rarity, an expensive piece of equipment which could only be afforded by the professional organisations and a very limited few amateurs of considerable personal means.

In those days, almost any piece of portable equipment was designated "Midget," in comparison with the very much more bulky static machines, but it has only been in comparatively recent times that portable recorders have become really small enough to deserve this title. That this is almost entirely due to the mass production of the transistor goes without saying, since it was not possible to develop really small equipment when the medium of amplification was the valve, even though smaller and smaller valves were being made.

Much of the credit due for the breakthrough in miniature equipment must be given to the Japanese, particularly in the domestic field, and simple recorders from this source are at present on sale, small enough to be carried in an overcoat pocket or a lady's handbag, and costing as little as £5. Obviously it cannot be expected that at this price the quality of reproduction will be all that could be desired, but at least these machines will record and play back speech with reasonable success.

At the other end of the price range, the really high quality recorder used nowadays by very many professional broadcasting and recording organisations is capable of results superior, in some respects, to many of the large static professional machines. Obviously this class of performance has to be paid for, and such machines as this cost in the region of £300.

Between these two extremes, £5 and £300, a very wide choice exists, and it should be possible to satisfy the most exacting recordist's requirements.

It may not at first be evident that the requirements in the matter of portable recorders may vary, but there is as much disagreement as to what is required in this case as there is in the case of the larger mains-operated machine. The final decision, of course, must be a personal one, governed, in all probability, by the amount of cash available, but a number of other points should be discussed before this final barrier is reached.

The first point that must be known is a simple one, and that is whether the portable machine is to be the only machine the recordist owns, or whether he already has a mains-operated machine to start with. The facilities expected of the portable machine will be different in each case.

Suppose one is buying a tape recorder for the very first time. The first inclination may be to invest hard earned savings in a mains-operated machine, but if one has never used a recorder before it might well be worth considering the merits of buying a portable. I think it fair to say that anyone who has worked with tape for some time will agree that when he started he really had very little idea of all the things he could do, or wanted to do, with this medium. In fact, he probably started off under the impression that a tape machine was used solely for the storage of sound, whereas it can be much more than that, a means of artistic expression.

In this day and age, when so much of our entertainment is served up to us in "canned" form by the radio, television and recording organisations, it is refreshing to realise that in the

tape recorder we have a new means of self expression. Of course many people reading this magazine will not need to be told this, as is evidenced by the large numbers of entries for the various tape recording contests, but to the newcomer to the hobby this particular idea may be strange.

With this in mind, the battery portable has much to commend it. It can be used at home, possibly with a mains unit to avoid the cost of frequent battery replacements, and it can be taken anywhere, independent of all mains supply, to record sound effects, on-the-spot interviews, and all the other actuality material that goes to make an interesting production.

For this type of use, the particular recorder chosen will probably be one of the more comprehensive types, having many of the features we have come to associate with mains-operated equipment. For example, it will probably have at least two tape speeds, usually $3\frac{1}{2}$ and $1\frac{7}{8}$ ips, motor driven fast forward and backward wind, and may even have mixing facilities for two simultaneous inputs. It should have a fairly large loud-speaker so that a good standard of reproduction can be achieved. It is desirable that it should take reels of tape at least as large as five inches, in order that a reasonable recording time is possible when the machine is used at home.

All of the foregoing argument presupposes that we are buying our very first recorder. A rather different state of affairs exists if we already possess a mains-operated machine, particularly if it is a comprehensive one having all the features described above. In this case, the requirements of our battery portable may well be rather different.

(Continued on page 15)

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
HITACHI BELSONA TRQ-399 (Reviewed this issue) <i>Lee Products (Great Britain) Ltd., 10-18, Clifton Street, London, E.C.2.</i>	3½, 1½ (2-tracks)	150-7,000 at 3½ ips 150-4,000 at 1½ ips	—	—	500mW	4½ (inc. batteries).	8½×6½×3½	3½	4×2½	Dynamic	—	Four 6V torch batteries.	Transistorised; variable rewind speed, combined record level and battery life meter; earphone monitoring; extension speaker socket. AC adaptor available.	£36 15 0
MIDGETAPE CHIEF 400 (Reviewed March 1962) <i>Thomas A. Edison Ltd., Victoria House, Southampton Row, London, W.C.1.</i>	1½ (2 tracks)	150 to 5,000	42dB	Less than 0.7%	10mW at 200 ohms	3	8½×3½×1½	2½	2	Dynamic	50	One Mercury Battery	—	£129 0 0
MIDGETAPE CHIEF 500	3½ (2 tracks)	50-10,000 ±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
MINY Model 401 <i>L.P.R. Ltd., 28, Curzon Street, London, W.1.</i>	Approx. 3½ 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; earphone monitoring; pause control; power rewind; speed adjustment.	£16 5 6
NAGRA III B <i>Livingstone Laboratories Ltd., 31, Camden Road, London, N.W.1</i>	15, 7½, 3½ (Full track)	30-15,000 ±1dB at 15 ips	52dB	0.15% P.P.	Line O/P 1.55v at 100 ohms	Approx. 15	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
OPTACORD 412 (Reviewed July 1962) <i>Highgate Acoustics, 71-73, Great Portland Street, London, W.1.</i>	3½ (2 tracks)	50-12,000 ±3dB	46dB	—	One watt	9½	14½×9×4	4½	6×3½	Dynamic	8 hrs. continuous 20 hrs. intermittent	Five 1½v U2 cells or AC mains 110/22v	Mains Battery recorder Push-button control powered rewind; position indicator; two inputs; magic eye recording level indicator, pause control; tone control; one motor.	£47 5 0
OPTACORD 414	3½ (2 tracks)	50-12,000 ±3dB	46dB	—	One watt	9½	14½×9×4	4½	6×3½	Dynamic	8 hrs. continuous 20 hrs. intermittent	Five 1½v U2 cells or AC mains 110/220v	As 412 except; combined record level and battery life meter; high frequency controlled motor offering high degree of stability.	£49 7 0
PHILIPS EL3585 (Reviewed Nov. 1, 1961) <i>Philips Electrical Ltd., Century House, Shaftsbury Avenue, London, W.C.2.</i>	1½ (2 tracks)	120-5,500 ±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; line output for external amplifiers.	£25 4 0
SOLATRON AT300 <i>Solatron Electronic Group Ltd., Victoria Road, Farnborough, Hampshire.</i>	7½ (2 tracks)	40-14,000 ±2dB	—59dB weighted	0.16% (RMS)	2,000 ohms 600 ohms	13	12½×8×4	5 (7 with lid open)	—	—	30 hrs.	1½ v cells or mains adaptor 110, 127, 220v.	Battery/mains operation; push-button control; variable and automatic volume control; VU meter; headphone monitoring.	On application
SONY IEM <i>Tellax Ltd., Gallows Corner, Colchester Road, Romford, Essex.</i>	7½ (Full track)	100-5,000 ±5dB (CCIR)	50dB below peak	0.3% RMS	—	13½ inc. accessories.	13×6½×4½	5	—	—	—	Six 1½v Penlight cells	Spring motor. Automatically twists tapes after recording to distinguish from unrecorded tapes. Battery/mains operation; combined record level and battery life meter; fully transistorised; electronic back-spacing; microphone pause control; powered rewind; one motor; headphone monitoring; two additional inputs; push button control.	£208 19 0
SONY 801	3½, 1½ (2 tracks)	90-9,500 at 3½ ips	—	—	250mW	13	12½×10½×4	5	5×3	Built-in dynamic (15 ohms impedance)	10 hours continuous	Six 1½v Flashlight cells or mains 110/220v		£93 9 0

(Continued from page 13)



THE AIWA TP30



BUTOBA MT5



BUTOBA MT7



DANSETTE CADET



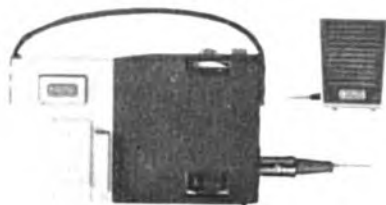
DOKORDER PT-4KB



E.M.I. RE321



FI-CORD 202



EUMIG T5



MIDGETAPE CHIEF 400

All we now need is the simplest possible machine, small, lightweight, with no unnecessary frills, and capable of recording from a single input, either microphone or high level. A single tape speed may well be all that is necessary, and a very high standard of recording quality is desirable. In order to achieve this, many of the features required in the earlier example may be dispensed with. For example, the large loudspeaker, with its power output stage, is unnecessary. All that is now needed is a small speaker unit or even a headphone output, to check that the recording has been satisfactorily made.

It may well be possible to do without a motor driven fast wind, relying on a hand crank for this, and at least one professional machine does without an erase head, although this of course means that "clean" tape must be used. All these are really extravagances in a machine designed for use in any location away from mains supply. The one thing that must not be sacrificed under any circumstances is the recording quality.

We will now take a brief look at some of the battery portables at present available to see how far our two types of user can be satisfied. There are at least twenty-five machines available to the prospective purchaser at the present time in this country, and possibly many more. They range from the very simple machines available from the chain stores, costing under £5, but not really high quality enough to be considered for anything but dictating purposes, to the Nagra fully professional machine, costing £307, giving results to satisfy the most critical user.

In the highest price range we must also include the clockwork-driven professional Sony IEM, selling at £209, and the EMI RE321, the transistorised successor to the world famous L2, the first professional battery portable to be universally accepted. All of these would be ideal for our second group of recordists, although the EMI machine is rather too large, and weighs 17½ lb., too much in my opinion to qualify as really portable.

Coming now to machines in the £60 to £100 bracket, a rather wider choice is presented to us. Probably the most interesting is the Uher 4000 S Report, more fully reviewed elsewhere in this issue. This instrument will easily

(Continued on page 17)



PHILIPS EL 3585



STUZZI MAGNETTE



MINY 401

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
STELLA ST470 (Reviewed July 1962) Stella Radio & Television Co. Ltd., Astra House, 121-123, Shaftsbury Avenue, London, W.C.2.	1½ (2 tracks)	120-5,500 ±3dB	-40dB	0.5%	250mW	8	11½×4½×7½	3 (4 with lid removed)	4 round	Moving-coil cardioid	20 hrs	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; line output for external amplifiers.	£26 5 0
STUZZI MAGNETTE (Reviewed Sep. 7, 1960) Recording Devices Ltd., 44, Southern Row, Kensington, London, W.10.	3½, 1½ (2 tracks)	50-5,000 and 40-9,000	50dB	0.25% (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
STUZZI MAGNETTE STUDIO	7½ and 3½ (2 tracks)	40-14,500 at 7½	50dB	0.2%	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 headphones.	£78 15 0
TRANSCORDER TR100	3½, 1½ (2 tracks)	150-7,000 at 3½ ips	—	0.3%	100mV	4 (inc. batteries)	6½×6½×1½	3	2½	Dynamic	Motor: Six hrs. continuous; amplifier: ten hrs. continuous.	Six penlight cells and two PP3 or equivalent Mallory cells. Separate AC/DC adaptor.	Remote foot control; one motor, combined recording level battery life indicator; powered rewind; leather carrying case and strap; monitor earpiece; telephone adaptor available; steel case; one switched control.	£51 9 0
TRANSCORDER TR300 Fonadek (Bransom), Ltd., Vivian Road, Harborne, Birmingham 17.	Rim-driven Variable (2 tracks)	300-4,500	—	—	150mV	4 (inc. batteries)	8×7½×2½	3	2½	Crystal	Motor: 75 hrs. continuous; amplifier: 90 hrs. continuous.	Six penlight and three UM2s.	Combined recording level battery life indicator; remote foot switch available; built-in carrying handle; earphones; one switched control.	£19 19 0
UHER 4000 S' REPORT Reviewed this issue Bosch Ltd., 205, Great Portland Street, London W.1.	7½, 3½, 1½, 1½ (2 tracks)	50-20,000 50-16,000 50-9,000 50-4,500 all ±3dB	55dB	0.15% at 7½ ips	One watt	8	11×8×3	5	4½	Dynamic with remote control.	12 hrs. intermittent use	Five 1½v U2 or rechargeable battery or mains-operated power unit.	Fully transistorised; push button controls; remote control; powered rewind; combined record level/battery life meter indicator; built-in microphone amplifier; socket for hand or foot operated remote control and for Akustomat, signal operated stop/start; accumulator rechargeable from 6, 12 or 24v car battery; rev counter; monitoring facilities.	£97 13 0
UHER 4002 STEREO REPORT	7½, 3½, 1½ and 1½ (4 tracks) Uher 4004	50-22,000 50-18,000 50-11,000 70-5,000 all ±3dB	55dB	0.15% at 7½ ips	One watt	7	10½×8½×3½	5	4½	—	Five hours continuous use; 12 hrs. intermittent use.	Four 1½v flashlight cells; or rechargeable battery; or mains-operated power unit.	As for Uher 4000S Report plus Stereo record/playback; separate modulator for each channel; separate VU meters; battery life indicator.	£115 10 0

(Continued from page 15)

satisfy both our groups of users, having four speeds, $7\frac{1}{2}$, $3\frac{1}{2}$, $1\frac{1}{8}$ and 15/16 ips. All this, with power rewind and very good quality reproduction from its internal loudspeaker, in an extremely small case, and weighing only 7 lb.

Of very similar size and weight, and selling at about £62 and £79 respectively, are the Stuzzi Magnette and Magnette Studio, the first operating at

$3\frac{1}{2}$ and $1\frac{1}{8}$ ips, and the second at $7\frac{1}{2}$ and $3\frac{1}{2}$ ips, and both capable of very good service. The Fi-Cord 202 must not be omitted, again operating at $7\frac{1}{2}$ and $3\frac{1}{2}$ ips, but I feel I must mourn the fact that its predecessor the Fi-Cord 1A is no longer available. This latter machine, weighing only $4\frac{1}{2}$ lb., seemed to me to be much easier to use than almost any other portable. The Butoba MT5 is also in this price range, at £86, and has many of the features found in mains-operated equipment. It could well satisfy my first group of users, and the weight is not excessive at 12 lb.

In the lowest price range, from £20

to £60, there are a number of very useful instruments. Whilst we obviously cannot expect the quality of reproduction as from the highest priced equipment they are capable of some very good results.

At the upper end of this price range is the Optacord 414, selling at just under £50. This machine is an improved version of the "412" which we reviewed last year (*July issue*), and incorporates a meter recording level indicator instead of a magic eye. An ingenious system is used to stabilise the capstan motor against variations of battery voltage. A second high frequency oscillator is used, in addition to the bias oscillator and the output of this is rectified and applied to a transistor in series with the DC motor supply. The oscillator is normally damped so no control voltage is present, but a centrifugal switch on the motor shaft opens at 3,000 rpm, applying the controlling voltage and slowing the motor. As the revolutions drop, the switch closes again removing the control voltage allowing the motor to speed up again, and so on. A very accurate speed control is thus achieved.

The Philips EL3585, priced at £25, and running at a single speed of $1\frac{1}{8}$ ips, can produce some surprising results, and its sensible "upright" construction does allow a larger than usual loudspeaker, with consequent improvement in reproduction. The Eumig T5, selling at £25, is probably one of the lightest recorders available, weighing only $1\frac{1}{2}$ lb. Although this is primarily intended for use with a Eumig cine camera, it can be used on its own, and is small enough to be carried in a lady's handbag.

What of the future? The manufacturers of the Uher Report have just announced that they will have a stereophonic version of their excellent machine on the market in the late summer of this year. This machine will be available in half-track and quarter-track versions at about £110. All the features of the mono Report will be retained.

Many other machines could, and should, be mentioned, but time and space do not permit; what must be said is that the possession of a battery portable, whether it is one's first machine or whether one already has a mains machine, will add considerably to this absorbing occupation of tape recording.



NAGRA IIIB



OPTACORD 412



STELLA ST470



SONY IEM



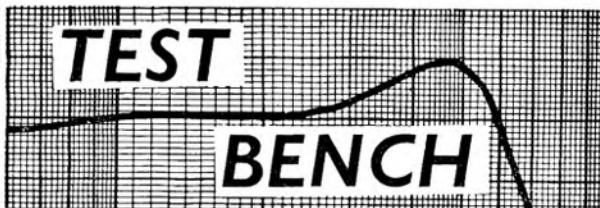
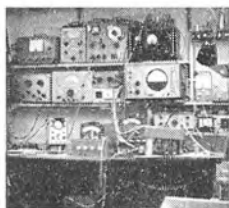
SONY 801



TRANSCORDER TR100



UHER 4004 REPORT STEREO



Three battery portables examined

THE UHER 4000 S REPORT

By H. Burrell Hadden

LET me say right from the start that if I had £100 or so to spare I would not hesitate to buy a Uher 4000 S Report. This machine seems to me to be the most interesting battery portable I have handled, with the exception of the professional "Nagra" machine costing three times the price.

Of course one cannot say that the "Report" could give as good results as the professional instrument. One gets what one pays for, in this as in anything else, but certainly the results from the "Report" should satisfy most amateur, and probably many professional requirements.

The "Report" has so many useful features that it is difficult to know where to begin; it is light in weight, only just over 7 lb., and small in size, the dimensions being approximately 10½ x 8½ x 3¼ inches. The machine is attractively styled in two shades of grey, and the metal case is very robust, a most important feature for any portable equipment. The case is provided with a detachable carrying handle, and a leather protecting cover with a shoulder sling is available as an accessory. In spite of the small size, the machine will accept spools of tape up to five inches in diameter.

Unlike any other machine, so far as I

am aware, this portable gives the choice of no less than four recording speeds. A control on the top panel enables immediate selection of 7½, 3¾, 1¾, and 15/16 ips. Operation of this control also switches on the equipment. With the slowest speed, using double-play tape, continuous recording of four hours per track is possible on this two-track machine. Fast forward and reverse wind are provided, and the time taken to rewind a five-inch reel of double-play tape was just under three minutes. The



fast wind was extremely smooth and even, a most important feature when thin tapes are to be used, since an uneven wind can be the cause of considerable damage to the edge of the tape. The wind on this machine was better than many mains-operated machines, and would certainly cause no trouble.

The operating controls are extremely simple. After selecting the tape speed and switching the machine on as described above, the tape motion is controlled by a series of piano-type keys.

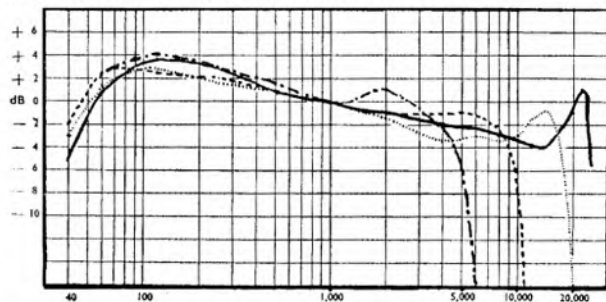
Two of these govern the fast forward and reverse wind; one starts the tape in the play condition; another when pressed at the same time as the play key, switches the machine to record. A fifth key is a pause control, useful to enable the recording level to be set before the tape is set in motion. A double-width key stops all tape motion.

Four rotary controls are associated with the amplifier; the first of these is the replay volume control, the second the replay tone control; then comes the recording level control, and finally the input selector, with positions for gram pick-up, radio, and microphone. The separation of the recording level control from the replay volume control is a very good feature, since the recording level can then be left set whilst the tape is monitored, without the necessity of resetting it again to continue recording. The first three knobs each have an additional function; they have combined with them a switch which operates when the knob is pulled out. In the case of a replay volume control, this switch cuts the internal loudspeaker, the switch on the tone control illuminates the recording level meter, and that on the recording level control switches this meter to read the state of the battery.

Input and output connections are made by means of the now standard, at least for most Continental machines, multiple plug. The microphone socket is on the top panel of the machine, so that it is easily accessible when the recorder is used with a shoulder sling. Three other sockets, on the side of the machine, account between them for inputs from radio or gramophone; a socket for an external loudspeaker or monitoring earphone; an output to feed a high quality amplifier; a means of connecting a battery charger or mains converter; and for the connection of a remote control. This remote control facility is an electrical one, and will operate the machine either from a switch on the reporting microphone supplied, or from a separate control supplied as an accessory.

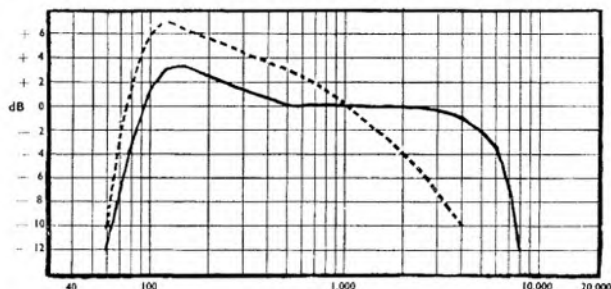
The amplifier is fully transistorised, having no less than ten transistors, and can be powered in three different ways. It can be operated from 1.5 volt U2 type cells, in which case continuous operation of approximately five hours is possible; or from a dry accumulator, available as an accessory, which will give ten hours. The charger for this accumulator, also an extra, can be fitted into the machine so that it can act as a mains supply unit for

Below: Record/replay characteristics of the Uher 4000 S Report. 7½ ips ——— 3¾ ips 1¾ ips - - - - - 15/16 ips - - - - -



Frequency in cycles per second

Below: Record/replay characteristics of the Hitachi TRQ399. 3¾ ips ——— 1¾ ips - - - - -



Frequency in cycles per second

static operation. The recorder can also be operated from a motor car battery by means of a special adaptor cable.

The 4000S "Report" was given the normal technical tests, and in every case came well up to the makers specification. The record/replay characteristics at the four operating speeds are shown in the accompanying graph. No tolerances are given by the makers, but this is a most interesting performance. On practical tests, the machine gave the excellent performance to be expected from such a technical specification. An excellent feature is that the machine is relatively indifferent to rapid changes of position, so that if it swings round when used on a shoulder strap the quality of the recording will not be affected.

The microphone supplied with the recorder is a moving coil cardioid type, and gives useful discrimination from sounds arriving off its axis, a most desirable feature when recording interviews in noisy surroundings. It is hoped to say more about this microphone in a future issue of this magazine.

The operating manual supplied with the "Report" is very comprehensive and most clearly written.

I am sure I do not need to repeat that this is a very fine machine, and I for one will be very sorry to have to return it to the suppliers!

THE HITACHI TRQ 399

By H. Burrell Hadden

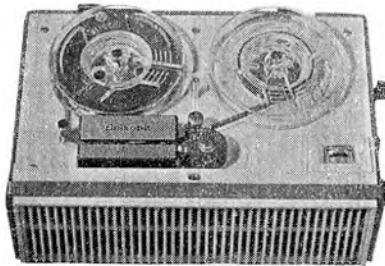
THE Hitachi TRQ-399 is a small battery-operated tape recorder in the medium price range. It is extremely portable, and unlike many portable machines it truly deserves the title of "midget." The dimensions of the case are $8\frac{13}{16}$ x $6\frac{1}{8}$ x $3\frac{3}{8}$ inches and the weight is approximately 4.4 lb. A leather carrying case, with a shoulder sling, has a pouch to contain the microphone, input and output leads, and monitoring earphone. The pouch also has sufficient room to carry a spare reel of tape if required.

The machine operates at two tape speeds, $3\frac{1}{2}$ and $1\frac{7}{8}$ ips, the change from one speed to the other being effected by changing the size of the capstan. The method of doing this is quite simple, a screw on the top of the capstan is removed, and a sleeve then taken off in order to change to the slower speed. A plate is provided on the deck to receive the sleeve and screw so that they do not get lost. Fast forward and rewind facilities are provided, and the time taken to run through a 200 ft. reel of long-play tape was just over three minutes. The maximum reel size the machine will accommodate is three inches and the greatest recording time possible is 68 minutes at $1\frac{7}{8}$ ips.

The controls on the TRQ-399 are extremely simple and few in number. A single lever control combines the operations of play, forward and reverse wind, and in conjunction with the record

button, the operation of recording. The only other control is the volume control, operating on both record and replay. Record level indication is by means of a meter, set in the top of the tape deck. This meter also gives a check on the condition of the batteries when the machine is switched to play.

A useful remote control facility is available when the microphone is in use, a switch on the microphone controlling the motion of the tape as required. In order to use this facility the machine must be set to record, which means that the pinch wheel is engaged, and the switch on the microphone then controls the operation of the motor. In consequence of this, it must be remembered to disengage the drive after a period of



recording has been completed, so that "flats" do not appear on the pinch wheel, or uneven tape drive will result.

Miniature jack sockets, with the appropriate plugs, are provided for the two inputs, one for microphone and the other for radio/gram. A third socket allows the connection of an external loudspeaker, at the same time muting the internal one. A fourth socket is used with the remote control.

The amplifier is fully transistorised, having seven transistors. High frequency AC bias is used for recording, but the erasing system uses DC to operate the erase head. Whilst this system undoubtedly erases the tape successfully, a note of warning must be sounded that the tape may become permanently magnetised after a number of erasings, and may in its turn magnetise the record/replay head of this machine or any other machine on which it may be played.

Power supply is by means of four small unit dry cells, which are accommodated in two plastic sleeves in order to prevent damage to other components in the event of their leaking. Access to the battery space is by the removal of the bottom panel of the case. A socket is provided in the back of the case for the connection of a mains adaptor, available as an accessory. The battery consumption is 200mA when the audio output is 200mW. The maximum power output is 500mW, and this gives a good audio signal from the 4 x 2½ in. elliptical loudspeaker.

The machine was given the usual technical and practical tests, and performed quite well. The frequency response from microphone input to loudspeaker output at both speeds is shown in the accompanying graph, and it will be seen that the manufacturer's quoted figures of 150-7,000 cps at $3\frac{1}{2}$ ips and 150-4,000 cps at $1\frac{7}{8}$ ips were well realised, although the makers do not specify any tolerances over these ranges. In the case of wow

(Continued on page 21)

AMERICA'S ONLY TAPE RECORDING MAGAZINE

Since 1953, this magazine has totally been devoted to tape recording. In addition to its timely articles, our columns also feature:

- Tape Reviews
- New Products
- Industry News
- Questions and Answers
- Feedback (letters from readers)
- Crosstalk (an editorial)
- Club News (tape correspondence clubs)
- Tape in Education
- Book Reviews

A one year subscription, including overseas postage, \$4.75

TAPE RECORDING

SEVERNA PARK,
MARYLAND, U.S.A.

Tape-to-Disc Services

RAPID Recording Service

78s and L.P.s. from your own tapes. (48 hour service). Master Discs and pressings. Recording Studio. Mobile Recording Van.

Associated Company—

EDUCATIONAL RECORDINGS LTD.

Specialists in Sleep-learning and Audio Learning. Tapes on Mind Management; Positive Personality; Memory Training; How to Pass Examinations. Manufacturers of the "Sleep-o-matic Unit" to be used with our Sleep-learning tape. Foreign language courses available for sleep-learning.

Brochures on request from:—

RAPID RECORDING SERVICE (Dept. TRG)
21 Bishops Close, Walthamstow E.17 COP 3889

IF QUALITY AND DURABILITY MATTER

(especially with LPs from your precious tape recordings) consult Britain's oldest transfer service.

If minimum 20 identical copies are required, we can manufacture hard-wearing commercial pressings with your own labels. (Excellent fund-raiser.)

... also consult Audio Supply Association for unbiased information on reliable recording and reproduction equipment to suit your specific requirements. Members receive information on latest products and also benefit from special bulk purchases of tapes, equipment, accessories. (Membership 7s. 6d. p.a.). Please specify requirements for first free consultation.

SOUND NEWS PRODUCTIONS

10, Clifford Street, New Bond Street, London,
W.1. REG 2745.

Life's livelier with **COSSOR** *of course !!*



Featured in this issue

CR 1620 Cossor's all-transistor battery tape recorder. Twin track recording at $1\frac{7}{8}$ " / sec gives 2 hours playing time with 4" D.P. tape. Sensitive moving coil microphone, 3" D.P. tape and direct recording lead supplied. Batteries: Six $1\frac{1}{2}$ volt U2 batteries gives approx. 20 hours play. Optional

mains conversion unit available. Features: Tape speed remains constant during working life of batteries. Combined recording level and battery voltage indicator. Weight: 8 lb. Dimensions: Width 12", Height $7\frac{3}{4}$ ", Depth $4\frac{1}{4}$ ".

Optional extras: Mains Unit £5. Carry Case 45/-

25gns



CR 1603 Excellent 4-track recording and playback with the minimum of controls. $5\frac{1}{2}$ " D.P. tape at $3\frac{1}{2}$ " / sec gives 6 hrs. playing time. 5" L.P. tape and moving coil microphone supplied. All-transistor amplifier eliminates warm up time. **28 gns.**



CR 1604 2-speed ($1\frac{1}{2}$ " and $3\frac{1}{2}$ " / sec) 4-track! Truly practical, combining simplicity in design and operation with many superb technical features. Plays up to 17 hours with 7" D.P. tape. **39 gns.** including moving coil microphone, radio connecting lead, 5" L.P. tape and spool.



CR 1605 This new, outstanding 4 speed, 4-track machine gives 34 hours play on 7" D.P. tape at $\frac{1}{4}$ " / sec! All-transistor amplifier eliminates warm up time. Microphone and 7" reel of L.P. tape supplied. Wood cabinet covered in washable two-tone P.V.C. **62 gns.**

COSSOR RADIO & TELEVISION LTD., 233 TOTTENHAM COURT ROAD, LONDON, W.1.

TEST BENCH

(Continued from page 19)

and flutter, no figures are given by the manufacturers, and it cannot be denied that a certain amount of this trouble is to be heard. However, it is not sufficiently serious at 3½ ips that music cannot be recorded, and the 1½ ips speed can give quite acceptable recordings of speech. A rather worse fault, which made itself felt, or heard, in the practical tests, was that if the machine was used slung from the shoulder any swinging movement of the equipment seriously affected the tape speed, and the recordings were noticeably impaired. However, with suitable care this should not happen, and although this is not any excuse, this fault appears in many other portable recorders.

The Hitachi TRQ-399 is supplied with a moving coil microphone, input and output leads, a single earphone, splicing tape, polishing cloth, an empty spool, and a reel of LP tape. There is a comprehensive instruction book translated from the original Japanese into rather quaint English. The whole outfit sells at 35 guineas.

THE COSSOR 1620

By John Borwick

THE Cossor CR1620 is an upright-style transistor portable recorder with the single speed of 1½ ips. It is a two-track machine and will take three-inch reels, or four-inch reels if the clear plastic cover is removed. So far as the general make-up is concerned, I have already commented favourably on a similarly laid out recorder (*Stellaphone ST470 review in the July 1962 issue*).

THE CONTROLS

A row of three white keys on top of the deck, control the running of the machine. These can all be operated with the lid in position or with the machine inside its carrying case, and are push on/slide forward to release. The outer keys are for Fast Rewind and Fast Wind On. The centre key switches the machine to Playback or, when a red pillar is depressed simultaneously, to Record.

There are no other controls on the top panel, and threading of the tape is made as simple as it could possibly be by the straight slot in the head cover. This cover is easily removed to give access to the heads for cleaning or for marking during editing—two operations which are briefly described in the twelve-page instruction leaflet.

The front grille covers an efficient four-inch loudspeaker and carries the volume control and level meter. The pointer of this meter moves over three coloured bands. A black band indicates the normal range of recording levels, with movements into the red segment indicating too high a level. The green band gives a check that the supply voltage is up to par—the meter giving

this reading during all the time that the machine is switched to Playback. The volume control is of the edgewise type, numbered 1 to 10 and does not incorporate an on/off switch since no warm-up time is needed (the transistor amplifier comes up to full gain as soon as the playback/record key is depressed).

POWER SUPPLIES

For mobile recording, the normal power supply consists of six standard 1.5 volt torch batteries. The leak-proof type are recommended, of course, and the life based on four hours per day is said to be twenty hours. However, a much longer service life will be achieved if the daily usage is less than four hours.

A handy mains supply unit is available as an extra (£5 0s. 0d.), and was tried out during these tests. The supply unit itself is in a metal case measuring 6 x 3½ x 2½ inches. One lead is taken to AC mains rated at 110, 127, 220 or 240



volts, and another lead terminates in a contact block which is simply pushed into the battery compartment.

ACCESSORIES

The microphone is a neat moving coil type. Amongst other things, this means that the microphone cable can be pretty well any length we like, and in fact 6½ feet of cable is supplied. The quality of the microphone's reproduction—tested separately—was found to be well up to that of the recorder as a whole. This is a healthy arrangement, in marked contrast to some recorders at twice the price of the present one, which are supplied with an inferior microphone whose relatively poor performance sets a limit to the quality overall. The Cossor's microphone is described as a cardioid—that is responding to sounds over a wide frontal angle, but insensitive to sounds at the back. I put this property to the test, and found that the microphone does indeed discriminate quite a bit in favour of sounds arriving at the front, particularly for middle and high frequencies.

For recording without the microphone, a special connecting lead is supplied. Depending on how you connect it, this lead allows you: to record from the speaker or diode sockets of a radio; to record from the loudspeaker or line sockets of a second tape recorder; to record from the loudspeaker or crystal pickup sockets of a record player; or to play back through an external amplifier, etc.

Available as an extra is an extremely smart carrying case selling at £2 5s. 0d. This has an adjustable shoulder strap and holes which give access to the controls. It was found quite easy to operate the recorder while carrying it in this way,

the only difficulty being that it is not possible to keep an eye on the level meter readings.

PERFORMANCE

This recorder soon gives the user a feeling of confidence in operation. The sound quality is quite acceptable. Tapes recorded on this machine were replayed on more expensive equipment and found to cover a fairly wide frequency range. The rewind and fast wind timings were 97 and 125 seconds for the three-inch reel of double-play tape supplied.

The Cossor CR1620 may safely be recommended to the growing numbers of people who want an inexpensive recorder that they can take anywhere, to add outdoor and travelling sounds to their repertoire, as a means of supplying ready-taped music programmes of their own choice, or for taping on-the-spot interviews, etc. It cost £26 5s. 0d.

Latest news from the trade

SAGA Records announce that all their tape issues have been re-mastered, and are now being duplicated by Tannoy Ltd., who have a new department specially for the purpose. Saga also point out that their issues are now being marketed with leader tape at both ends.

Well over a hundred titles are now available, and these cover jazz, show, folk, pop, dance, and classical music. A number of childrens records are also available. Prices are to remain the same for this varied repertoire, and all their issues are now catalogued as follows.

The STG series (3½ ips, twin-track mono on five-inch reels) sell at 32s. 6d.; the STE series (7½ ips, twin-track stereo on seven-inch spools) cost 63s.; and the TD series (3½ ips twin-track mono on three-inch spools in five-inch boxes) cost 9s. 11d.

New titles and a complete new catalogue are being prepared and will be available shortly.

Saga Records, 127, Kensal Road, London, W.10.

COSMOCORD LTD. announce that their microphone sales in 1962 topped every previous record, reaching a total of 300,000 mono and stereo units. Of these some 22,000 were exported to all parts of the world. This export figure is also higher than any previous year, and was achieved in the face of keen competition from the USA, Germany, Japan and other countries.

IN view of the numerous inquiries for the names of firms who can undertake service work on Walters tape recorders, it may interest readers to know that the following state that they can carry out this work:

Walters Headquarters Service Centre Ltd., 10, College Slip, Bromley, Kent. (Ravensbourne 9755.)

Sound Servicing Equipment Co. Ltd., 129, Lower Richmond Road, Putney, London, S.W.15. (Putney 1021.)

Tape Recorder Maintenance Ltd., 323, Kennington Road, London, S.E.11. (Reliance 5252.)

DO-IT-YOURSELF

BUILDING A CASE FOR THE GRUNDIG TK1

By A. R. HUNT

I DISCOVERED soon after purchasing my Grundig TK1, that it was not quite as easy to record "snap-sounds" as I would have liked. So I set about trying to alter the situation. Although the lid was attractive and efficient it was a decided handicap "in the field," and required a fair amount of room to stow it away. The microphone lead also, usually became entangled round one, or both, spools, and when one is in the public eye, so to speak, it did not look very efficient to have to untangle the microphone lead and stow away the lid.

I decided that, above all, there must be *NO* alteration to the actual recorder. I also wanted to retain its elegant appearance when used indoors. To satisfy both needs an "Ever Ready" type of case was envisaged. Two main features had to be incorporated—lightness and strength, plus the convenience of operating the controls without any fumbling about. It also had to be reasonably waterproof.

I decided to construct the case from wood. Fortunately I had enough old double-dark slides, the type used years ago by photographers to carry plates in (plateholders in fact), and these are constructed from Mahogany, $\frac{1}{4}$ inch thick, and, in my case, 15 x 12 inches overall. Being no hand at drawing up plans, I only sketched out the basic idea roughly, and added details as I went along.

The basic dimensions of the case (outside measurements) were 12 $\frac{1}{2}$ inches long, 4 $\frac{1}{2}$ inches wide, 8 $\frac{1}{2}$ inches deep. In addition to the wood, the following are also required: Two 48 inches long, $\frac{1}{2}$ inch wide strong leather straps; one brass hinge 1 $\frac{1}{2}$ x $\frac{7}{8}$ inches; one small knob; one small fastening latch for the door; bifurcated rivets; a supply of soft—but *NOT* fluffy—lining material; a piece of foam-rubber 12 x 4 inches, and,

of course, glue and some $\frac{1}{2}$ -inch panel pins ($\frac{1}{4}$ lb. is ample). Also needed were two $\frac{3}{4}$ -inch "Dee" rings for joining the two straps, and a shoulder pad. My own is made of leather and rubber lined. I would suggest that one is obtained with the strap loops slightly bigger than the width of the strap. This will allow freedom of movement of the case without having to adjust the pad every time, I assure you, some sort of support is needed!

Any respectable photographic dealer will have a good assortment of shoulder pads in stock, but beware of the all-rubber type, they split very easily I have found, and the slight extra cost of a leather pad is well worth it.

While you are in the shop, it would be a good idea to see what cases would be suitable for a microphone pocket. I already had one—a shoe-shine case actually!—but any case will do, provided it is easy to fasten and unfasten, and is not too bulky, mine measures 4 $\frac{1}{2}$ x 1 x 4 inches.

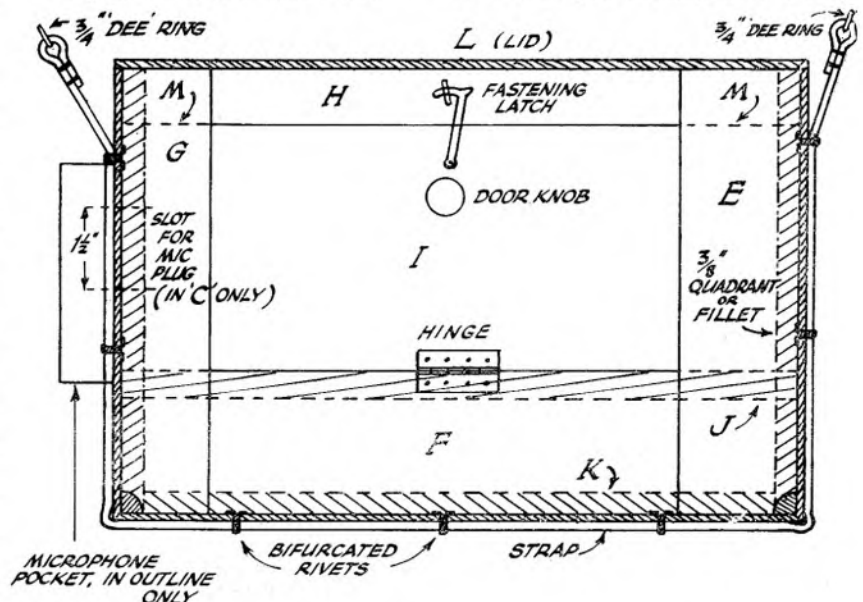
The construction of the case is quite simple, no fancy joinery is used (budding cabinet makers can improve on this arrangement no doubt!) I had no workshop, so it was a case of clearing a space on my writing table, (ahem!) and the only tools needed are a tenon-saw, set-square, ruler, pliers, small hammer, a good vice and if possible, two or three clamps to hold work when glued, and a fretsaw.

Cut out the base first, (A), and to this glue and pin either your $\frac{3}{8}$ -inch beading, either quarter-round or fillet, as shown in the drawings, make sure, however, that no panel pins come through, or you may scratch the recorder. Before fixing the sides, (C) and (D), cut out the hole for the microphone plug in (C), this measures 1 $\frac{1}{2}$ x 1 inch, and should be *very carefully marked out before cutting*. I found the best way was to stand the recorder on the base, and *carefully* measure up the side, allowing some slight extra clearance for a margin of safety. Having done this, and fastened the sides, fix in the beading, glue and pin as before. *Warning: Check to see that the microphone plug can be fitted easily before adding the back piece.*

If all is in order, proceed by adding the back, (B). By now, with any luck, your case should be fairly rigid, and I suggest you fasten *one* of your leather straps (X) all-round the case with bifurcated rivets, drill both strap and case at the same time to ensure perfect alignment. It will simplify the task if buckles etc., are removed first. I used three rivets on the base and two for each side. Do not make the holes too big, or you will find the heads of the rivets pulling through the strap, with dire results!

Bend the two ends of the rivet over, making sure that they are very tightly fixed against the inside of the case, there must be no play in either rivet or strap.

Fig. 1. Front view of the case



When fixing strap (X) try and get the middle of the strap in the centre of the case, leaving an even amount above the top of the case. Also, this is *very important*, fix the strap as central as you can, but beware, do not cover up the microphone plug-hole, it could lead to bad words later on.

I started fixing the strap on this side of the case, and with the recorder in the case, the microphone plug attached, I clamped the strap to the side, and marked its position. I allowed plenty of room to get my fingers on the plug, but keeping the strap as near central as possible.

Having secured the strap to your liking, the next thing is to fix (K), (J), and (M). Piece (K) acts in two ways, as a stiffener for the front, and to allow the recorder to sit in the case without moving about, and it is essential to check very carefully that (K) does *not* foul the recorder. Put the machine in the case and lightly pin (K) to ensure a perfect fit, allow a slight margin for the lining material.

Piece (J) must also be carefully fitted, as any excess here can catch on the spools, so again, mark carefully with the recorder in the case. Next fit (M). This goes *behind* (P), (H) and (E), and should be no more than one-eighth of an inch thick, otherwise you will catch the head cover of the recorder on it.

At this stage, it is advisable to fit some small pieces of wood up the sides of the case to act as guides, ensuring that the recorder does not tip forward and foul the controls. These pieces can be glued only, and should be covered with foam rubber or lining material, to avoid any scratches on the recorder deck.

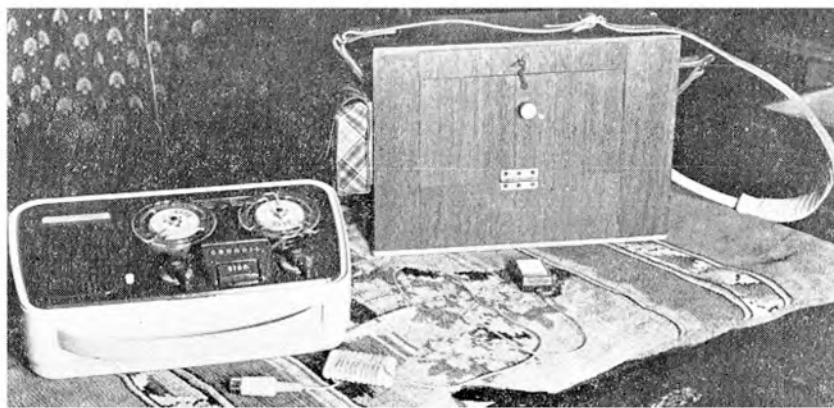
Now, cut and fit the foam-rubber to the base. This lines the case, except the back and front, with your lining material. Ensure that it is well stuck down, and do not forget that plug-hole. Cut out this hole when the lining is dry and trim away any odd strands of material. This may save trouble later on.

Next we can continue with the front and lid. Measure and cut out (G), (H), (E) and (F). When these are all pinned and glued, cut and fit the door (I), ensuring that it is a good fit all round.

I have illustrated how I fitted the door-knob and latch, but you may have your own ideas, and fittings, so we will now pass on to the hinge.

I stipulate a brass hinge as this is rust-proof, and looks decidedly better than an iron one. A chrome-plated hinge will look even better, of course. If you can get one, but be it brass or chrome, I advise fitting it to the door first, and then to piece (F). Having fitted your door, and ensuring its efficient operation, the lid (L), can be cut and fitted. Here again the actual method of fitting can be left to the builder, mine is simply fastened in place with two small catches (from my plateholders). Which ever method is used, it is advisable to make the lid a tight fit, as it covers the entire outside dimensions of the case, thus adding some protection against rain seeping into the case and on to the recorder.

Once the lid is made and fitted, you can turn your attention to strap (Y) and here strength is very important. Make certain you join both straps (X) and (Y) together *very firmly*. Failure to ensure a sound join can mean a hefty repair bill!



Above: The TK1 and case with the microphone former laid out on the table, prior to fitting the recorder and microphone into one compact travelling unit

To start with, fit a "Dee" ring on to the end of strap (X), fold back two inches of strap and fasten with bifurcated rivets, leaving the curved part of the ring uppermost. Treat the other end of strap (X) likewise, and when finished the two rings should project about one inch above the top of the case, ready to accept the two ends of strap (Y).

Lay out strap (Y), and about one-foot from the buckle end, mark and cut off.

with cardboard, and lined it with foam-rubber to reduce any shock to the microphone. I then glued the pocket to the former, and fastened it with staples and very small tacks.

While this was set aside to dry, I made another light-weight former, this one for wrapping the microphone lead round—no miles of lead trailing for me, thanks! This former, measuring $2\frac{1}{4} \times 2\frac{1}{4}$ inches thick, was cut from an old date box made

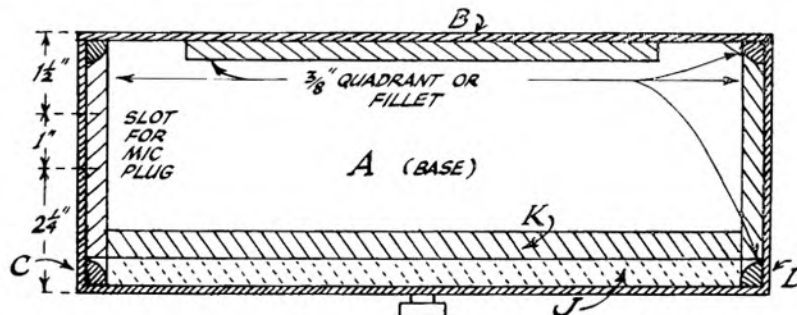


Fig. 2. Bird's-eye view

Attach the non-buckle end of strap (Y), to the "Dee" ring on strap (X) at the microphone-slot side of the case. Using a two-inch fold back as before, fasten with bifurcated rivets.

Fasten the holed end of strap (Y) to the "Dee" ring at the other end of the case strap (X), slip your shoulder pad on, and join up the strap in the normal manner; you can now sling the case around you, *not* over one shoulder please, and adjust for height; the controls of the recorder should fall easily to hand.

Before dashing out into the wilds with case and recorder there is one item left to fit—the microphone pocket; I fitted mine as follows: I made a cardboard-laminated former the size of my case, cutting an aperture for strap and microphone-slot in the case. This was glued and lightly-pinned to the wooden case and left to dry. I then very carefully marked out and cut the appropriate slot in the microphone-pocket, tested for alignment, and then stiffened the pocket

of some synthetic material. Extremely light but fairly strong, this was just what I wanted. Slots, cut down the long sides, acted as guides for the lead.

Now put the recorder in its case and plug in the microphone, leaving about three inches of lead loose; the rest can be wound around the former leaving about three feet clear at the microphone end. Tuck the former and lead into the case, wrap up the remainder of the loose lead, park the microphone in its foam-rubber pocket stowing the loose lead in after it, fasten the pocket flap, and you are ready for action.

To finish off the case, it might be advisable to wax polish the case. This all helps to keep out water. If your case is made of wood not having any finish, I suggest you give two or three coats of varnish, allowing each coat to dry, and rub down with fine grade "wet-or-dry" emery paper.

(Continued on page 24)

Recording linguistic fossils

By A. C. WILSON

WHEN England lost the last of her territories on the French mainland only the Channel Islands still remained in her possession, though they were now isolated politically from their French-speaking neighbours and

separated geographically from Britain by a hundred miles of stormy and dangerous seas.

Although the islanders continued to speak French they were cut off from many of the influences which, down the centuries, acted upon the language of the mainland to modify its vocabulary and change its pronunciation, so that it is not surprising that there is a great difference between modern French and the dialects spoken in the islands today.

It is even possible that Channel Island patois, by preserving old forms of the language unchanged, may contain "linguistic fossils" whose study would help to tell us how French was spoken at the time of the Norman Conquest. Unfortunately, however, the number of patois speakers is declining; modern communications and the growing popularity of the islands as holiday resorts means that their centuries-old isolation is at an end and practically everyone now speaks English.

Various attempts are being made by the islanders themselves to arrest this decline in the use of local dialects; societies and associations of patois speakers hold annual festivals at which prizes are given for the best amateur dramatic productions and recitations in Guernsey or Jersey French, and these have become very popular. But even if such activities achieve their aim of preserving patois from extinction, there are comparatively few written records of the language available for study outside the islands, and as a first step towards remedying this some members of L'Assemblaie D'Guernesiais have undertaken to compile a dictionary of island patois which, it is hoped, will be published in a year or two's time.

There is no doubt that the dictionary will be of considerable value in preserving a record of the language, but those who are making it are faced with some unusual problems. It was not until the middle of the last century that island speech was first deliberately written down; previously, islanders who spoke patois had always tried to write "good" French whenever they had to put pen to paper, and therefore the written records are not reliable guides to the way people of the period talked to one another.

DO-IT-YOURSELF

(Continued from page 23)

In addition, the straps should also be given a polish up with wax polish, as a preventive measure. If you are likely to be using your recorder in its case for any length of time, I suggest you drill about a dozen $\frac{1}{8}$ -inch diameter holes in the back of the case, to correspond with the ventilation grille on the underneath of the recorder. In order that the case would stand firm when placed on the ground, I pinned and glued two strips of half-inch half-round moulding along

the bottom of the case. Four rubber or metal feet could be used instead. This then completes the actual construction; what about the operation of the case?

I soon discovered that my efforts had not been in vain, and the time taken to get mobile is greatly reduced when compared to the time taken beforehand. I reckon to get "operational" within ten seconds. Having the microphone already plugged in, all that need be done is switch on, get the microphone out of the pocket, and that's it.

I know quite well that you recording experts will say at once, "Well, what about setting the controls, especially the microphone-volume," and here I am going to stick my neck out a bit. I leave this control ready set and, in cases of emergency, I can concentrate on the action happening before me, as I have a camera to operate as well.

Being a "one-man-band," so to speak, I had to devise a simple method of operating both recorder and camera. The camera side I have been used to for nearly twenty years, but I have only quite recently gone into the world of tape recording, and extremely fascinating I find it, too; there is a lot I have to learn, of course, but I find that my TK1 is being used far more than ever I thought it would.

I hope that the details I have given here will be of some help to TK1 owners who have found the same problems as I did. The case weighs only one pound, and costs only 7s. 3d.—for the two straps! I dare say if you dig around in the shed you can find suitable materials for construction.

In closing, I would like to repeat an earlier warning, namely, make your case strong, yet fairly light. Above all, fasten the straps very securely indeed. Extra attention to this last point will pay dividends I assure you; 7s. 3d. for straps is better than £7 3s. for repairs!

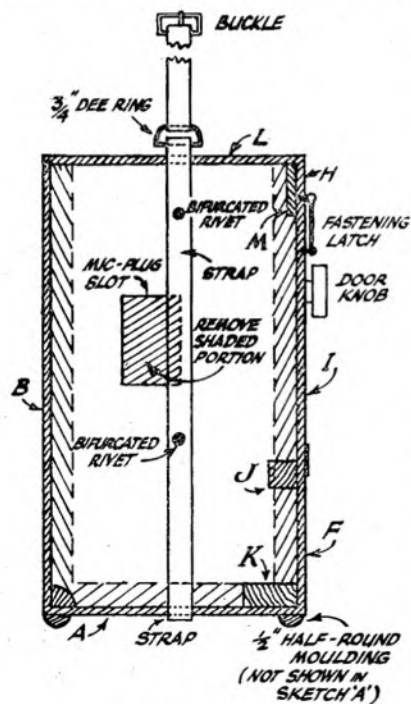


Fig. 2. The left profile

One of the beautiful bays on the island of Guernsey, where patois is still spoken

It was not much over a hundred years ago that George Metivier and others began to think that it was worth while recording patois for its own sake, and collections of songs and stories began to be made, but the problem then arose of finding a way to convey the pronunciation of the dialect words so that the reader would not only know what they meant but also how they sounded.

Various spelling conventions were adopted but they were not entirely satisfactory, and even today this problem has not been finally solved. Compilers of language dictionaries can, nowadays, use the symbols of the international phonetic script to show the correct pronunciation of the words they employ, but it takes a phonetics expert to do the job and is then only of use to other experts.

On a recent visit to Guernsey we discussed some of these points with members of L'Assemblaie D'Guernesiais and suggested a tentative solution to part, at least, of the problem.

It is obvious that some kind of sound recording would overcome the difficulty of conveying the pronunciation of the language to non-patois speakers, but it would be an enormous and costly job to record every word in even a small dictionary. Furthermore, dictionaries do not give every form in which their words are used and some important sounds would therefore be missing from the record.

If the attempt were made, in spite of these objections, it would be extremely difficult to find individual words on a tape or gramophone record containing at least forty or fifty thousand others. On the other hand, the number of different *sounds* in a language are not so very many and the recording of them presents no problem at all, once it has been decided what group of sounds needs to be preserved in order to give a complete picture of the dialect to those who have never heard it spoken "in the flesh."

Because of our mutual interest in these matters, the members invited us to spend an evening recording a wide variety of patois speakers and subjects at the home on the island of Mr. and Mrs. de Garis. We took our Fi-Cord recorder and Grampian microphone with us and taped a few feet of impromptu conversation among the

members, and then recorded a recitation by Mr. George Torode—an accomplished amateur actor—which lasted about ten minutes and provided an excellent example of Guernsey French usage and pronunciation.

Unfortunately, on playback, it was found that the tape had picked up a good deal of interference from an improperly-suppressed fluorescent light in the drawing room. By moving the Fi-Cord further from the light it was possible to avoid the trouble on subsequent recordings, and we next taped some unaccompanied songs by Mr. Torode and another member, Mr. E. M. Falla.

It was decided to meet again later in the week to re-record Mr. Torode's recitation and on this second occasion no technical problems marred his performance; he was followed by various members reading Guernsey proverbs in patois, and we also recorded two further songs. The final results of the two recording sessions have now been edited, and we have plenty of material to analyse and few, if any, additional recordings should be needed to provide a full sound-picture of the language.

Because of the ease with which tape-

recordings can now be made there seems little to prevent a full record being kept of all languages and dialects now threatened with extinction. Possibly some central library could be established where such recordings could be catalogued and stored.

In the case of our Guernsey patois tapes, we are thinking of having gramophone records made; they would then be available to supplement the information contained in the dictionary when it is published. This idea might also be extended to other foreign language dictionaries which could be offered for sale with sound-group recordings available at an extra charge. The dictionary entries could then refer to the bands on the record where the various examples of pronunciation were to be found.

This would be different in purpose to the foreign language courses already available on gramophone records, and might be useful not only to the solitary student but also to the teacher of foreign languages in schools and elsewhere. The use of sound recordings to preserve and teach languages has immense possibilities which are, surely, only just beginning to be explored.



Tape records reviewed

Beethoven Ninth ends tape cycle

CLASSICS



By Edward Greenfield

BEETHOVEN. Symphonies Nos. 1 and 9. London Symphony Orchestra conducted by Josef Krips with Jennifer Vyvyan, Shirley Carter, Rudolph Petrak, Donald Bell and the BBC Chorus. World Record Club (TT 162-3), 3½ ips, mono. 29s.

All nine Beethoven symphonies are now at last available on tape. Krips's is not the most monumental of readings of the Ninth, but there are few distracting idiosyncrasies. This is a performance that at first seemed a little unexciting when I sampled extracts, but hearing it from beginning to end reveals the overall, unobtrusive strength.

Beethoven's massive argument is unfolded with care and conviction, and more than many spectacular recorded performances this is a reading to live with and enjoy. The slow movement is a little cool perhaps, but better than a slushy over-romantic approach. The finale too has its moments of restraint—the famous military band passage begins more gently than usual—but with good soloists and chorus there is plenty of excitement without frenzy. It hardly provides the great "occasion" that many live performances do, but that in itself may make it easier to live with.

The performance of the first symphony too is fresh and straightforward. Sensibly

World Record Club has put both symphonies on a single tape—there is ample room on the spool—with the First Symphony coming before the Ninth. The turnover is between the first and second movements of the Ninth. Recording well up to World Records' high standards with the massive forces of the choral finale well handled, although the soloists are balanced rather far forward.

MOZART. Sonata No. 16 in B flat, K.570; Suite in C in the style of Handel, K.399; Fantasy and Fugue in C, K.394. Ralph Kirkpatrick. World Record Club (TCM 30), 3½ ips, mono. 29s.

This is a delectable recording. Ralph Kirkpatrick, one of the world's acknowledged authorities on eighteenth century keyboard music, plays here on a reconstruction of a piano of Mozart's day. Not exactly a forte-piano, but rather similar in its pleasantly twangy tone between that of a harpsichord and a modern piano. The unconverted might scoff at such an example of purism in performance, but in fact the sound is so delightful and so in keeping with the scale of the music that I feel the experiment adds enormously to enjoyment.

Kirkpatrick for all his preoccupation with the eighteenth century rejects the idea of prettifying Mozart. These are strong, forthright performances with plenty of rhythmic spirit and warmth too. These may not be among Mozart's greatest masterpieces, but I cannot imagine anyone failing to be refreshed by such music. The sound of the instrument is very well caught with the pleasant background sound of its comparatively primitive mechanics.

My one serious complaint is on the labelling. The box does not even give as much information on the identity of the pieces as I have listed above, and surely here is a clear case for printing the disc sleeve-note in a separate folder for the tape version.

PIANO MUSIC FOR FOUR HANDS. **BEETHOVEN.** Three Grand Marches Opus 45. **MENDELSSOHN.** Andante and Variations, Opus 83a. **SCHUBERT.** Fantasie in F minor, Opus 103. **DVORAK.** Slavonic Dances Nos. 2, 9, 13 and 15. Yaltah Menuhin and Joel Rye. World Record Club (TCM 32), 3½ ips, mono. 29s.

This is even more offbeat than the

World Record Club's Mozart tape reviewed above and very nearly as delightful. In the days before recorded reproduction the four-handed piano duet provided one of the standard ways of getting to know the orchestral repertory outside concerts, and thoughtfully many composers also provided original works for the medium. The tape has a selection of them, all little known except for the Dvorak dances, which were later orchestrated by the composer. I cannot pretend that the Beethoven pieces represent him at his best, but anything he wrote provides an interesting sidelight. The Schubert, however, is magnificent, and one can always relax with the Dvorak at the end. The playing is splendidly energetic—as all piano-duet playing ought to be—and the recording provides a warm piano tone.

My one complaint again is on the labelling. Really these works do require some comment and explanation: not one music-lover in a thousand would know off-hand for example the background to the Beethoven pieces. To make it even more confusing for the uninitiated listener the order on the label is wrong with the massive Schubert Fantasie coming before the delightful little Beethoven pieces.

SULLIVAN. The Mikado. John Wakefield, John Holmes, Clive Revill, Denis Dowling, John Heddle Nash, Marion Studholme, Jean Allister, Sadlers Wells Chorus and Orchestra conducted by Alexander Faris. HMV (TA CLP 1592-3), 3½ ips, mono. 35s.

Unlike the World Record Club with its recording of Beethoven's ninth noticed above, H.M.V. has transferred a two-disc set on to two tapes rather than a single one. Wisely I think, for lovers of "The Mikado" are more likely to want to play selected items, and the numbers contained on each track are clearly marked on the boxes, with Act 1 on TA-CLP 1592 and Act 2 on TA-CLP 1593.

This is the first complete Sadlers Wells recording of Gilbert and Sullivan—of any opera for that matter—and the company's shining merits of liveliness and good teamwork are well demonstrated. Inevitably there are moments of disappointment for Savoyards who remember classic D'Oyly Carte performances, and somehow the atmosphere of opulence that Sir Malcolm Sargent brought to his HMV disc version is missing too.

The "new look" given to the works by Sadlers Wells is reflected in the

AUTOMATED SLEEP-SUGGESTION

- WHAT IS SLEEP-SUGGESTION?
- HOW DOES IT WORK?
- HOW CAN IT BENEFIT YOU?

SEND NOW for FREE BROCHURE for up-to-the-minute information on this vital subject

EDUCATIONAL RECORDINGS LTD.
Dept. B, 21 Bishop's Close,
Church Lane, London, E.17

TAPE RECORDING AND HI-FI

By the Editor of TAPE Recording Magazine

The best available introductory guide
160 pages, 40 illustrations. 13s. 3d. (including postage)
from Tape, 7, Tudor Street, London, E.C.4

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



WELLINGTON ACOUSTIC LABORATORIES LTD., Farnham, Surrey (Fnhm 6461)

recording but in purely musical terms there is less advantage from this untraditional approach than I had expected. Perhaps Alexander Faris the conductor is partly to blame. He drives hard, and that in itself is attractive as his World Record Club performances have shown, but rather like his D'Oyly Carte counterpart, Isidore Godfrey, there is too little spring in the music with too rigid a beat. And Act 2 begins with a dispirited account of "Braid the raven hair." Sargent was far more interesting.

The singing is most reliable, and it is particularly agreeable to hear the women parts so well sung by Marion Studholme as Yum-Yum and Jean Allister as Katisha. John Holmes's superb voice suits the microphone perfectly in the part of the Mikardo, but I do wish the whole performance conveyed more of a sense of fun.

Bobby Vee

POPULAR

meets

the

Cricketers



By Don Wedge

BOBBY VEE MEETS THE CRICKETS.

Liberty (TA-LBY 1086), 3½ ips, mono. 35s.

The Cricketers came to fame with the legendary Buddy Holly, once a member of the group, and Vee is set much in the Holly style.

The combination of the two, therefore, could be expected to be highly successful. So it has proved. Exclude Elvis Presley, Cliff Richard and the show albums, and the disc version of this record has been among the biggest sellers of recent months.

The songs are the greats of the current pop idiom. Many are associated with other singers who have made their mark in the beat style.

The last of the 12 numbers is *The Girl Can't Help It*, written for the 1956 Jayne Mansfield film of the same name, which played an important part in the spreading of rock and roll.

There is Holly's *Peggy Sue*, *Bo Diddley* (almost an anthem of rock) and Little Richard's *Lucille*.

If you want to discover what current pops are all about, there could hardly be a better mentor than this combination of singer Vee and the instrumental-vocal Cricketers. If you know already, it will need no further recommendation.

ORGAN PLUS. . . . Fred Böhler Organ Combo. Music on Tape (EM 2), 3½ ips, mono. 36s.

Cha-cha is to the fore, but despite the exciting beat, the organ saturates the rhythms—making it a dull record.

Once again it is music from the continent and not all the dance rhythms are popular here.

"RE-PERCUSSION!" The Percussive Art Ensemble directed by Dick Schory. Saga (STE 3051) 7½ ips, stereo.

This novelty left over from the U.S. craze of 1960 for percussion records—no melody instruments, the tune such as it is being entirely carried by rhythm instruments—makes very unusual listening.

To get its full value and flavour, stereo is essential for this type of record. "Re-Percussion!" stretches sound reproduction to the full.

The tunes are, for the most part, unfamiliar. They are the type of light-weight, descriptive music the Light Programme fills many of its daytime hours with.

There is a feeling of everything but the kitchen sink being thrown in—piano, xylophone, guitars, carry most of the melody, but they are supplemented by bells, horses' hooves and what seems like innumerable drums.

It is a record for getting the most out of your recorder and something very unusual for background use.

The tapes reviewed this month are issued by the following companies.

"HMV," and "Liberty" by E.M.L. Records Ltd., 20, Manchester Square, London, W.1.

"Music on Tape," by Tape Recordings London Ltd., 188, Vauxhall Bridge Road, London, S.W.1.

"World Record Club," by World Record Club, Box 11, Park-bridge House, The Little Green, Richmond, Surrey.

Australian blind now have talking-book service

EIGHT hours a day, five days a week, two studios in Sydney and one in Melbourne are recording talking books for the blind societies in every Australian state. Circulating libraries on tape are being built up to bring the treasures of literature to the blind.

Talking books on tape superseded the original disc recordings with the advent of a machine developed at a cost of £160,000 by the Nuffield organisation and the Royal National Institute for the Blind in Britain. The player, "the multi-track tape talking book machine," was adopted by the Australian National Council for the Blind. In New South Wales, where the programme has made its greatest advance, public support has allowed almost 1,000 players to be issued and a further 340 are on order.

So far 200 titles are available. With the permission of the authors, publishers allow the talking versions to be made free on the understanding that they are for the sole use of the blind. Some books are recorded using one reader; others are in semi-dramatic form using a number of actors and actresses. The books are being returned to the libraries at the rate of 100 a day. One man, for example, borrowed a talking book, with 15 to 20 hours' reading, on a Friday and returned it on Saturday morning with a request for another one.

YOUR LOCAL DEALER

LONDON

HI-FI CENTRE

Branch of KINGS ELECTRONICS

178, HIGH STREET, E.17

Walthamstow's Leading Stockist of all makes of

TAPE RECORDERS

AMPLIFIERS, TUNERS, etc.

Free Demonstration in the comfort of your own home

'PHONE AMH 6242 or COP 4488

Lee Electronics

THE TAPE RECORDER & HI-FI AUDIO SPECIALISTS
400, EDGWARE ROAD, LONDON, W.2

London's leading Stockists of High-Fidelity and Audio Equipment.

Many Bargains in new and reconditioned Equipment

SEND FOR FREE LISTS OF RECORDING TAPES, RECORDERS, AMPLIFIERS, ETC

All Machines demonstrated for performance on Record and Playback. All leading makes of Hi-Fi equipment from stock

PADDINGTON 5521

- ★ TAPE RECORDER HIRE
- ★ TAPE TO DISC 78 & LP
- ★ RECORDING STUDIO
- ★ TAPE RECORDER REPAIRS
- ★ SALES—EXCHANGES

MAGNEGRAPH

1, Hanway Place, London, W.1.

Tel.: LANGham 2156

Leonard G. Francis presents—

SHEEN

TAPE RECORDER CENTRE LTD.

Specialists in Tape Recorders and Accessories etc.

—THE CENTRE FOR—

FRIENDLY HELP — SALES — SERVICE
HOME DEMONSTRATIONS ANYTIME
—MODELS FROM 19 GNS.—
PRE-RECORDED TAPE: LANGUAGES
DANCE · CLASSICS · JAZZ

CALL—WRITE—PHONE

8 Station Parade, Sheen Lane, Sheen, London, S.W.14 (next to Mortlake Station, S.R.)

Showrooms: PROSPECT 0985 10 a.m.—7 p.m.

YOUR LOCAL DEALER

MIDLANDS

**Audio Electronics
(Midlands) Ltd.**

Specialists in Dictation Mcs., Tape
Recorders, Inter-Com., Tapes and
Accessories

Full After Sales Service on all Equipment

PHILIPS, GRUNDIG, TRUVOX,
ELIZABETHAN, ETC.

203 STAFFORD STREET,
WALSALL. Tel.: 21086

SOUND BUSINESS

Specialists in
Sound Reproducing Equipment
Stockists of Butoba, Grundig,
Sony, Tandberg, Vortexion, etc.

Backed by a
First-Class Service Department

TYSONIC

W. M. Tyson, M.Brit.I.R.E.
41 Russell St., Leamington Spa
phone 24935

THE NORTH

**CUSSINS &
LIGHT LTD.**

YORK'S LEADING RADIO
TV & ELECTRICAL STORE

Visit our First Floor
TAPE RECORDER
CENTRE

LARGEST RANGE
OF RECORDERS
& ACCESSORIES
IN THE NORTH

KING'S SQ.
YORK



**TAPE RECORDER
CENTRE (Halifax)**

stock all the best tape re-
corders and hi-fi equipment.
Agents for Revox, Tandberg,
Ferrograph, etc. Demon-
strations by expert staff.
Two years' free service on
recorders over £35.

30 King Cross St., Halifax. Phone 66832

NEW PRODUCTS

**NEW STYLING
FOR
STELLA MODEL**

A NEW four-track, two-speed tape recorder has been introduced by Stella. This model, ST458, illustrated below will sell at £9 guineas.

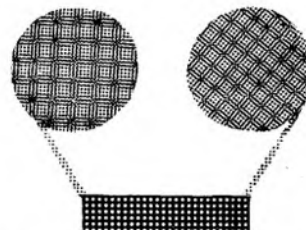
It has an entirely new styling with a sloping fascia control and speaker panel at the front of the machine. The right-hand panel houses all but two of the controls. The exceptions are the speed selector switch, placed at the top of the deck between the reels, and the track selector switch. On the control panel are push buttons for record, pause, play-



back, fast rewind, stop and fast forward wind, together with rotary controls for microphone/tone, pick-up/radio, and playback volume.

The quoted frequency response is 60-13,000 cps \pm 3 dB at 3 $\frac{1}{2}$ ips; and 60-10,000 cps \pm 3 dB at 1 $\frac{7}{8}$ ips. Wow and flutter is given as less than 0.6 per cent peak to peak, and signal-to-noise ratio as better than 40 dB.

The deck will accommodate up to seven-inch reels, providing a playing time of just over two hours per track at the slower speed using standard-play tape. Rewind for 1,800 ft. is achieved within three minutes. By using a pre-amplifier, Type EL3787, (together with an additional amplifier and loudspeaker) connected to the "stereo" output socket, stereo tapes can be reproduced. This accessory can also be used for Multiplay and Duoplay purposes. A parallel playback facility enables simultaneous replay of tracks one and three or two and four. Inputs are provided for microphone (1 K ohms 1 mV), diode (20 K ohms 3 mV), and pick-up (500 K ohms 150 mV). Output sockets include Diode (20 K ohms 1 volt, approx.) combined with input



socket, loudspeaker (3-7 ohms), headphones (1.5 K ohms 200 mV), and a stereo socket for use with the pre-amplifier. The power output is rated at 2 $\frac{1}{2}$ watts through the 6 $\frac{1}{2}$ -inch diameter loudspeaker.

The valve line-up includes an ECL82, and EM87, plus five transistors, one Diode, and a Selenium type mains rectifier. The mains voltage is 110-127, 200-250 volts, AC, 50 cycles. Mains consumption is rated at 55 watts.

The ST458 measures 14 $\frac{1}{2}$ x 14 $\frac{1}{2}$ x 7 $\frac{1}{2}$ inches, and weighs 18 lbs. It is housed in an attractive two-tone grey polystyrene cabinet with a detachable lid and retractable carrying handle. A stowage space for leads and connections is provided.

Stella Radio & Television Company Limited, Astra House, 121-3, Shaftesbury Avenue, London, W.C.2.

**LUXOR—A STEREO
RECORDER
FROM SWEDEN**

A NEW stereophonic tape recorder manufactured in Sweden has been introduced by Britimpex Ltd. who will handle the distribution in this country.

The recorder is the Luxor, a three-speed, two- and four-track unit, which will accommodate seven-inch spools.

The quoted frequency responses are 50-19,000 cps at 7 $\frac{1}{2}$ ips, 50-12,000 cps at 3 $\frac{1}{2}$ ips, and 50-8,000 cps at 1 $\frac{7}{8}$ ips. Wow and flutter is given at 0.09, 0.18 and 0.25 per cent rms at the three speeds. Channel separation is rated at better than 35 dB, and cross-talk separation as better than 60 dB.

Among the many features are separate magic eye recording level indicators for each channel, digital rev. counter, interlock to prevent accidental erasure, a three-stage tone control, speed switching whilst tape is running, facilities for mixing, superimposition (two separate tracks playing back together), and headphone monitoring, a separate balance control, and a pushbutton system which automatically returns to playback after each completed recording.

Inputs are provided for microphone (0.007 volts rms, 1 M ohms), pick-up (0.3 volt rms, 1 M ohm), and radio (0.02 volt rms, 1 M ohm). The bias and erase frequency is 85-95,000 cps. Playback outputs are 0.3 volts, 22,000 ohms each channel, and two watts, 4 ohms each channel.



NEW MOVING COIL MICROPHONE IN STC RANGE

SEEN for the first time at the recent Audio Festival was STC's omnidirectional moving-coil microphone. Type 4114, illustrated below. Housed in an attractive moulded case it has an effective frequency response maintained between 100-8,000 cps with a rise in response in the higher frequencies above 3,000 cps. It is designed for being hand-held or for table-standing. A threaded insert in the base enables the 4114 to be fitted to a standard camera tripod stand.

The quoted sensitivity is -80 dB/1 volt/dyne cm^2 . The nominal impedance is 200 ohms, suitable for feeding transistor input stages, without the use of an

The stereo power output is two watts per channel, four watts for mono. A loudspeaker switch has positions for external loudspeaker, built-in loudspeaker and external plus built-in speakers. There is also a socket for connecting a centre loudspeaker for stereo playback.

The mains supply can be 110, 130, 150, 220, 240 and 250 volts. Printed circuit amplifiers are used.

The Luxor is available in two versions. The MP 424, illustrated above, is housed in a two-tone carrying case covered with plastic-coated fabric and fitted with detachable carrying strap. It measures $14\frac{1}{2}$ (L) x $11\frac{1}{2}$ (W) x $6\frac{1}{2}$ (H) inches, and weighs $28\frac{1}{2}$ lb. The price is 77 guineas. The Model 423 housed in a teak or mahogany base measures $14\frac{1}{2}$ (L) x $11\frac{1}{2}$ (W) x $6\frac{1}{2}$ (H) inches and weighs $24\frac{1}{2}$ lb. The price is 74 guineas.

Britimpex Limited, 16-25 Great Russell Street, London, W.C.1.

STUZZI ANNOUNCE SIX NEW MACHINES

SIX new tape recorders have been announced by Stuzzi. Full details are not available at the time of going to press.

The first machine, the Stuzzi 201, is a two-speed, $7\frac{1}{2}$, $3\frac{3}{4}$ ips, half-track machine with a quoted response of up to 20,000 cps. Among the facilities are monitoring and superimposition. The price is 43 guineas. A built-in stereo pre-amplifier is incorporated in the Stuzzi 202, similar to the 201, but able to replay stereo tapes. This costs 47 guineas.

The third machine is the 203, a recorder with a built-in radio for local station reception. One speed, $3\frac{3}{4}$ ips, two tracks, and over four hours playing time is available on this machine which has a quoted response of up to 15,000 cps. Again monitoring and superimposition are among the features. The price is 55 guineas, including P.T.

The Stuzzi 604, known as the Radiocord Super, has two speeds, $7\frac{1}{2}$, $3\frac{3}{4}$ ips, uses the four-track system, has a response of up to 15,000 cps, and a built-in superhet radio receiver for medium and long waves. The price is 73 guineas, including P.T. An identical machine without the radio, the Stuzzi 504, will sell at 54 guineas.

The final newcomer is the Stuzzi Stereo Boy. This unit is designed for incorporation into an existing hi-fi set-up. It will replay stereo and mono tapes, and has a built-in pre-amplifier. The price is 37 guineas.

Recording Devices Limited, 44, Southern Row, Kensington, London, W.10.



input transformer. A connecting cable, STC LCR 1112, is included in the price of £3 13s. 6d.

Other units shown by STC included the Type 4113 uni-directional ribbon cardioid microphone which costs eleven guineas. Technical specifications are: Impedance, 30 ohms; directional discrimination 15 to 20 dB. It measures $2\frac{1}{4}$ x $1\frac{1}{2}$ x 2 inches, and weighs $10\frac{1}{2}$ ounces. It can also be used with the STC LCR 1112 connecting cable.

Their second new ribbon microphone is the Type 4115 noise-cancelling unit. Designed for close-talk applications, this sells at 17 guineas, measures eight inches overall (head unit $1\frac{1}{4}$ inches), x 2 inches (width) x $1\frac{1}{2}$ inches (deep), and weighs 10 ounces.

Finished in satin chrome, the 4115 has an impedance of approx. 30 ohms.

Their last new product to be shown are dynamic stereophonic earphones. Described as having a wide frequency range and low distortion at high sound levels, these cost six guineas.

A robust moving-coil system incorporating a plastic diaphragm is housed in lightweight shock-proof moulded enclosures. A comfortable headband is fitted to give a wide range of adjustment.

The earphones are correctly matched and phased, and are provided with a four-core connecting lead. The impedance is 200 ohms per earpiece. They weigh 10 ounces.

Standard Telephones and Cables Limited, Connaught House, 63, Aldwych, London, W.C.2.

YOUR LOCAL DEALER

THE SOUTH

HAMILTON ELECTRONICS

HIGH FIDELITY TAPE RECORDERS

35 LONDON ROAD SOUTHAMPTON

TELEPHONE 28622

PORTSMOUTH and SOUTHAMPTON

Tape Recorder Specialists

APPROVED AGENTS FOR:—
PHILIPS - GRUNDIG - FERROGRAPH
VORTEXION, ETC.

- ALL MAKES OF TAPE RECORDERS SUPPLIED
- ACCESSORIES AND HI-FI EQUIPMENT
- PART EXCHANGES AND SECOND-HAND MACHINES
- PROMPT AND SKILLED SERVICING

RECORDING MACHINES LTD.

299 Commercial Road, Portsmouth

Telephone: 23097

4 New Road, Southampton

Telephone: 27092

TAPE RECORDERS

(Bournemouth) LTD (Exeter)



Southern England's
Biggest Centres for

PHILIPS . FERROGRAPH
GRUNDIG . TELEFUNKEN

BRENELL . AND ALL LEADING MAKES

Accessories by return Call, write or phone

THE TAPE RECORDER PEOPLE

874 Christchurch Rd., BOURNEMOUTH Tel. 45096
3 Seamoor Road, WESTBOURNE Tel. 64292
1 Sidwell Street, EXETER Tel. 75779

SCOTLAND

GLASGOW

Tape Recorder Specialists

APPROVED AGENTS FOR:—

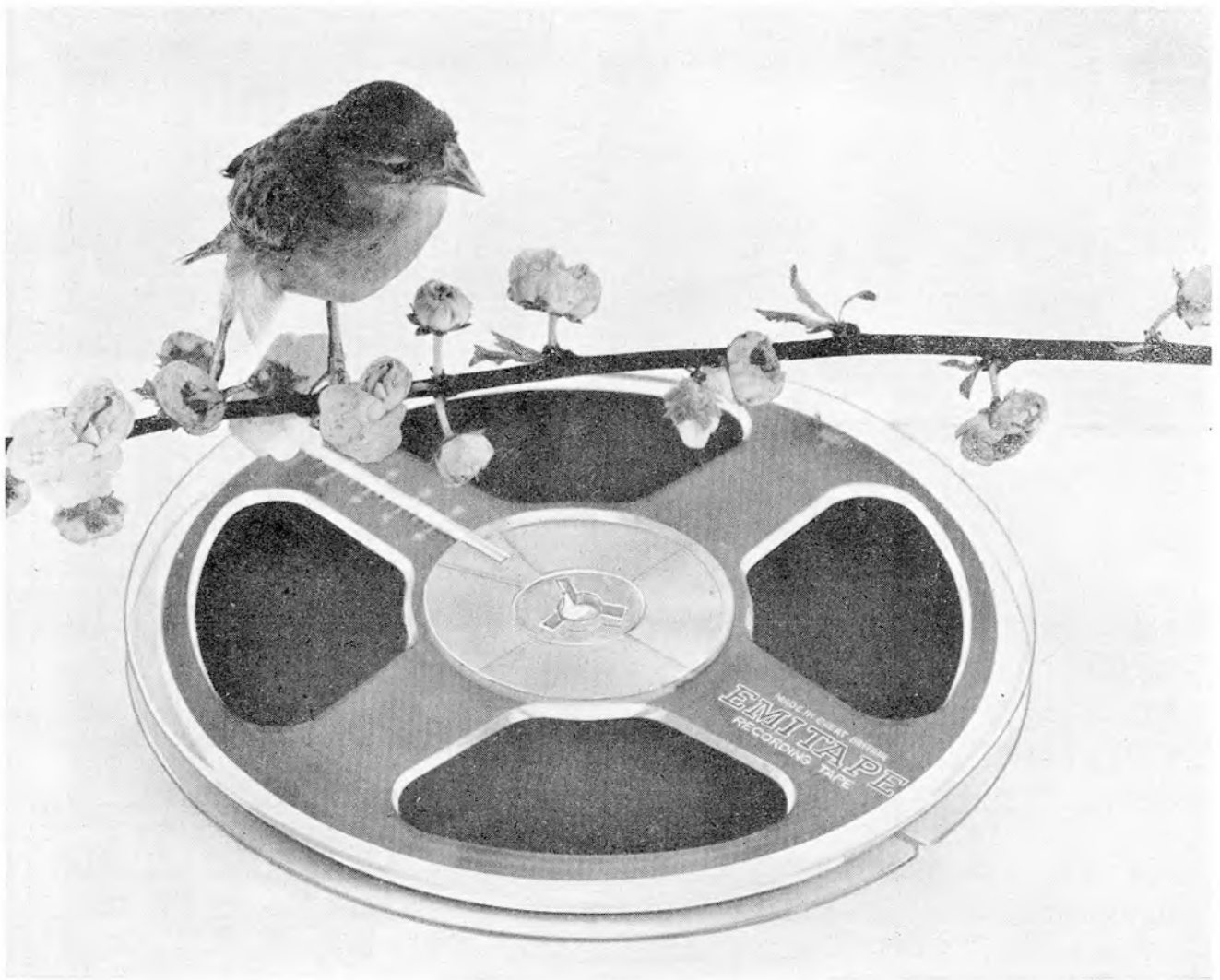
PHILIPS - GRUNDIG - FERROGRAPH
VORTEXION, ETC.

- ALL MAKES OF TAPE RECORDERS SUPPLIED
- ACCESSORIES AND HI-FI EQUIPMENT
- PART EXCHANGES AND SECOND-HAND MACHINES
- PROMPT AND SKILLED SERVICING

RECORDING MACHINES LTD.

60 ST. VINCENT STREET, GLASGOW, C.2

Telephone: City 3847/8



How to find summer with Emitape

This summer, don't leave your tape recorder at home gathering dust. Get another reel of Emitape. Then take it out and about, and give it a chance to hear what's going on in the world.

Children are playing outdoors. Lawnmowers are cricketsing. There's birdsong, and a buzz of insects. Mix these and other effects into your own tapes, and hear how evocative they

sound. Or try adding an 'on-location' sound track to a cine-film, or to a programme of colour slides.

DON'T KNOW HOW TO START? Then write in for the first of a new series of leaflets, *Tape Outdoors*. It's free! It was written specially for Emitape by John Borwick. And it tells you how to start outdoor recording. Also available—John Borwick's leaflet on *Tape Indexing*.

Get another reel of **Emitape**



Please send me your free leaflets, *Tape Outdoors* and *Tape Indexing*, by John Borwick.

NAME

ADDRESS

.....

.....

E.M.I. TAPE LIMITED, HAYES, MIDDLESEX



BARNESLEY

A change of meeting times and a new secretary is announced for the Barnsley club. In future meetings are to be held weekly on Thursdays at the YMCA, Eldon Street. The new secretary, John Fisher, points out that any evening members are welcome, as there is invariably someone in.

Secretary: John Fisher, Studio One, YMCA Buildings, Eldon Street, Barnsley, Yorkshire.

BROMLEY

A change of secretary is announced for the Bromley club. Future inquiries should be addressed to Mrs. J. Beric, 212 Kent House Road, Beckenham, Kent.

BURY ST. EDMUNDS

A tape club is to be formed in Bury St. Edmunds. Interested persons are invited to contact the instigator Eric J. Raison at 29 Severn Road, Bury St. Edmunds, Suffolk.

CATFORD

At the March AGM of the Catford club members elected a new secretary. He is B. W. Blakeney, 246 Ardγων Road, Catford, London, S.E.6.

ILFORD

The latest newsletter of the Ilford club claims increased activity among members. Among recent events on their programme have been an evening of members' stereo; and two evenings listening to tapes produced by members. On March 22 they heard some of the recordings made recently of the Ilford Promenade Orchestra. These featured a public concert at the Town Hall.

Part two of the programme is to consist of "Tape Techniques" an illustrated talk on products and problems involved in members' recording ventures. On April 5, the club heard recordings of the "Sonics" a jazz group recorded late last year. After the interval the finals of the Quiz championship took place.

High spot of their year so far was the Question and Answer evening attended by a panel of representatives of the tape recording press. The very varied questions included club coverage in the magazines, the old favourite "which is the best tape?," and editing techniques. Some time was spent discussing plug standardisation, and after the interval, the panel listened to faults which had appeared on recordings and gave their opinions of the causes. The programme was recorded on a Vortexion by Rob Steel.

A humorous evening had preceded this, on February 18. Members had been invited to a "Tape recorded investigation into the Anomalous behaviour of animals under circumstances of conditioned reflex" . . . bring your own dog-biscuit unquote. Members, for their troubles in attending, heard a singing dog, a dog that could count, a talking canary, a dog that howled when he heard a musical box, and underwater noises made by a goldfish. After much discussion the tape recorder uttered a bull bellow, and it was announced that much of the programme had in fact been "cock-and-bull." I leave you to guess which had been faked.

Sound effects had featured in an even earlier programme when members listened to each others efforts in a presentation called "Whazzat." The exercise was to decide what effect the offered sound was suitable for. The sound of wood being sawn was produced by playing back at half speed the recording of a microphone stand being rubbed; and similar speed juggling made a whistling kettle sound exactly like a ship's siren. The sounds were produced by Ron Powell, John Fenner and Fred Faulkner.

Secretary: Dave Bolton, 99 Seventh Avenue, Manor Park, London, E.12.

LEICESTER

Yet another change concerning a secretary, this time at the Leicester club. Peter Starie's new address is given below. The club meets on the second and fourth Thursday of the month at the Leicester Museum.

Three of the club's recordings of May Day songs have been broadcast by the BBC in the Home

News from the Clubs

Service. The recordings had been made by chairman J. Moule for local Women's Institutes, who have collected over sixty songs of "May Days" of fifty years ago. The BBC heard of the collection and approached the club members to use them. The Leicester Museum are to receive copies of the recordings once they are edited and made into discs.

Secretary: Peter Starie, 43 Western Park Road, Leicester.

NATIONAL FEDERATION

The A.G.M. of the National Federation of British Tape Recording Clubs was held on April 20 at the Hotel Russell. Delegates from the Avr, Boston, Bedford, Coventry, Crawley, Eastbourne, Friern Barnet, London, Solent, West Middlesex, and Woolwich clubs were present, but as this did not constitute a quorum (25 per cent) it was not possible to take a decision on the amended Constitution. A postal ballot is to be arranged.

During his Report, Chairman Alan Stableford referred to a total of 41 member-clubs, about half of those known to be active. He also commented on the now firmly-established quarterly competition and the Federation Library. This now contains all the BATRC prize-winning tapes, and many of the International winners, and is being expanded to include tapes on a wide variety of technical aspects of tape recording. All are available free to Member clubs.

The decision to take space at the Audio Festival as an alternative to the usual Annual Congress had proved to be a popular move. A large number of amateurs had been brought into contact with the work of the clubs and the Federation, and many had expressed appreciation of the Contest tapes demonstration.

Following his report, nominations were called for the new Committee; in their absence the present committee was declared re-elected. These are: Chairman, Alan Stableford; Secretary, E. Roger Aslin, 1007a, Finchley Road, Golders Green, London, N.W.11; Ken Blake, Stanley Mace and Fred Gazeley. The accounts for the year 1962/63 had been audited by the London club, and were accepted.

NORTH MANCHESTER

A new club has been formed in Manchester. To be known as the "North Manchester Soundtrackers," it will also cover the interests of hi-fi enthusiasts. Among its members are former members of the Middleton club.

Secretary: A. Lomas, 2 Hamer Hill, Chapel Lane, Blackley, Manchester, Lancashire.

SOUTH AFRICA

A talk and demonstration on his home-made FM tuner was given by Mr. Monro at the March 18 meeting of the South African tape society in Johannesburg. Also heard during the evening was a playback of Norman Paul's 1958 BATRC winning tape *The Rest is Silence* and the latest Philips 10 x 10 stereo amplifier EM 9007 A/AA. Other demonstrated equipment included Thorens disc units and Trio stereo amplifiers, and a presentation of a variety of effects by a representative of BASF tape.

At an earlier meeting members heard the second set of winning entries from the International Amateur Recording Contest, including South Africa's *The River* produced and presented by Derek Worman.

Chairman: Billy Stuart, P.O. Box 11326, Johannesburg, South Africa.

THORNTON HEATH

At their AGM held on April 4 the secretary and committee were re-elected. During the evening their future programme was discussed. This included visits by manufacturers with Mr. Francis of Streatham demonstrating the Brenell range on April 11; BASF, their film *The Magic Tape* (May 30); and Simon, their SP5 (June 20). Also to be welcomed to the club was a team of hand-bell ringers (May 11) who were to demonstrate their art and allow members a chance to make recordings. Other future arrangements include recording an organ recital, an orchestral concert and a dance band rehearsal, and a visit to a professional recording studio.

Work is proceeding on the club's entry for the BATRC, and the club's own monthly competitions continue to attract excellent entries for the award of a silver cup.

Recent individual members' efforts at recording included a fast bit of work by one member who

was not named. This gentleman recorded the 500th Anniversary Service at St. Wulfram's Church, Grantham, conducted by the Archbishop of Canterbury, arriving home at 2.30 a.m. He then proceeded to edit the programme over the weekend, and presented the finished thirty-five-minute tape, with linking commentary, to the members on the following Thursday.

Interviews have been collected from the Mayor of Croydon and Miss Marie Lohr, who recorded get-well messages for the club's hospital programme. The members are now preparing a record request programme for a second local hospital. Other social service trips have been organised. A Streatham Church is to arrange a special Choral Service to be recorded for playback to four local Old Folks' Homes.

Splicing and editing were described and demonstrated by John Bradley at one of the March meetings of the Thornton Heath club. Members were invited to try a number of splicers on show after they had received instruction on their operation. The prototype of a new splicer by BASF had been loaned for the occasion.

Secretary: Mrs. M. L. Bashford, 4 Dunheved Road North, Thornton Heath, Surrey.

UXBRIDGE

As the majority of members of the Acton club are resident in Uxbridge, it has been decided the HQ should move to that area. The club will meet weekly at the Treaty Room of the "Crown and Treaty House" in Uxbridge.

At the last of the Acton meetings, members welcomed a representative of Simon Equipment Ltd., who demonstrated the company's SP5. This machine had been under much discussion by members, and Simon's offer of a demonstration was nicely timed, and greatly appreciated.

Earlier in the month members had stripped a Telefunken 75-15 recorder. The machine had developed faulty switch contacts, and was used as a practical demonstration on maintenance. The servicing raised such interest that club evening closed much later than usual, accompanied by a great sigh of relief from the machine's owner.

Secretary: Dave Wiseman, 8 Woodhurst Road, Acton, London, W.3.

WHITSTABLE

The last two meetings of the Whitstable club featured a tape/slide show from Rhodesia and a demonstration of stereophonic headphone listening, as well as the usual quizzes. "Sexton Blake and Murder at Seven" the members' thriller serial began and is pursuing its improbable course every fortnight. Old and new members pair up to produce subsequent instalments.

Members have received a request to assist in the compilation of a programme entitled "Faversham in Sound." Forthwith they started to collect material which is expected to include interviews with local residents, and sounds of the town's main industries. These will be edited into two or three thirty-minute feature tapes for the club's archives.

Members had enjoyed a full programme for the previous month, when they heard the playback of five-minute competition tapes, which required the narration of a true story. Norman Davies recalled his 1937 voyage to the Baltic on a private yacht; a Police Cadet described an amusing incident whilst on patrol; and Bill Blake told of his experiences when he was mistaken for the reincarnated son of a bereaved and very distraught mother.

Ken Pearce occupied the second half of the meeting with a talk on the elementary principles of tape recording.

At the second February meeting Ken Pearce continued the "Tell-a-story" contest with a tale of his talking cat. To prove this had been no figment of his imagination, he produced recordings of conversations he had had with his feline friend, including a question and answer session.

Twelve-year-old Peter Robinson then provided the quiz, and amazed the older members with his dexterity at blending music, voices and sound effects in his lone effort.

The main item of the evening was the presentation of a talk by the secretary, who described the fascination of correspondence by tape. He illustrated his talk with many recordings, including such items as the Stockholm Town Hall clock, a guitar group in Honolulu, patriotic songs from Switzerland, a boxing match in New York and jungle noises from Africa.

Secretary: Tom Robinson, 17a, St. Anne's Road, Whitstable, Kent.

CLASSIFIED ADVERTISEMENTS

Rate—Sixpence per word (minimum 5s.); Trade, ninepence per word (minimum 10s.); box numbers, one shilling extra. Payment with copy. Copy should be sent to Advertising Department, "Tape Recording Magazine," 7, Tudor Street, London, E.C.4.

NEW EQUIPMENT

Ferrograph 5 A/N, 422 and 424, Revox E36, etc., always in stock. City and Essex Tape Recorder Centres. (See page 9).

TAPE RECORDERS. SAVE FROM 30 per cent to 60 per cent on the original price. Large stocks of second-hand, new, shop soiled machines. All guaranteed. Obtainable on our NO INTEREST TERMS. Best part exchange allowances on your existing equipment. CALL, WRITE, PHONE today for free list. Quotation and details. Our Mail Order covers the whole Country.—R. E. W. Earlsfield Ltd., 266, Upper Tooting Road, London, S.W.17. Balham 7710.

ORDER TO NEWSAGENT FOR "TAPE RECORDING MAGAZINE"

Published on the third Wednesday
in every month. Price 1s. 6d.

To
(Newsagent's name and address)

Please deliver me one copy of
"TAPE Recording Magazine"
each month until further notice.

(Signed)

Address

Tape Recording Magazine is published by Print & Press Services Ltd., 7, Tudor Street, London, E.C.4, and distributed by Trans-World Circulation Co., Park Royal Road, N.W.10.

ORDER FOR ANNUAL SUBSCRIPTION TO "TAPE RECORDING MAGAZINE"

Please post me one copy of
"TAPE Recording Magazine"
monthly for one year. I enclose
£1 in payment.

(Signed)

Address

MISCELLANEOUS

A BINDER is the ideal way of keeping your copies of *Tape Recording Magazine* clean and ready for easy reference. Prevents torn covers and dog-eared edges. Each copy is inserted as received to form a completely bound volume. All pages open flat and effect secure binding with steel bars from first to last copy. Strong board binders covered with rexine with the title printed in gold on spine. Price 14s. 6d. (post free) from *Tape Recording Magazine*, 7, Tudor Street, London, E.C.4.

8mm. Home Movies. Send 1s. for fully illustrated catalogue. (Dept. 31), Mountain Films Ltd., 1, New Burlington Street, London, W.1.

Good cash prices for tape recorders—Tel: Maryland 5879. (See page 9).

Recorder need repairing? Then let City and Essex Tape Recorder Centres do it for you expertly and economically. (See page 9).

YOUR TAPES FOR BROADCASTING

WE NEED YOUR TAPE REPORTAGES OR GOOD SOUND RECORDINGS FOR USE IN RADIO PROGRAMMES. CONTRIBUTIONS FROM OVERSEAS ARE PARTICULARLY WELCOME. IF YOU HAVE SOMETHING TO OFFER OR ARE KEEN TO MAKE YOUR HOBBY PROFITABLE PLEASE WRITE FOR FULL DETAILS TO DEPT. AMPT, RADIO FREE EUROPE, WARNERPATHE HOUSE, 135, WARDOUR STREET, LONDON, W.1.

MAGNETIC TAPE

A SERVICE FOR THE CONNOISSEUR. Ferrotape available by post, all sizes in stock. Also Hublok empty spools. Send for price list. J. Turner, 51, East Street, Horncastle, Lincs.

Hi-fi Magnetic Recording Tape, brand new top quality direct from manufacturer. Today's finest Tape value. Money refund guarantee. Price examples: 5 in. standard 600 ft. PVC, 10s. 6d.; 5½ in. LP 1,200 ft. PVC, 15s. 6d.; 7 in. DP 2,400 ft. tens. Mylar, 37s. 6d. Large stocks all sizes tape spools and cassettes. P. & P., 1s. 6d. Detailed leaflet on request. TONRITE ELECTRONICS, 4, Monkville Avenue, London, N.W.11.

TAPE BARGAINS IN ALL SIZES. Example: Top Brand 5½ in., 1,200 ft., 19s. 6d., P. & P., 1s. 3d. S.A.E. for list. Large choice of new and used recorders.—E. C. Kingsley & Co., 132, Tottenham Court Road, London, W.1. EUS 6500.

TAPES post free. High quality, low price. Long play, 4 in., 450 ft., 8s. 6d.; 5 in., 900 ft., 12s. 6d.; 5½ in., 1,200 ft., 16s.; 7 in., 1,800 ft., 22s. 6d.; Double play, 3 in., 400 ft., 9s.; 4 in., 600 ft., 12s.; 5 in., 1,200 ft., 20s.; 5½ in., 1,800 ft., 28s.; 7 in., 2,400 ft., 36s.; Discount on four or more. Refund guarantee. M.S. Recording Tapes, 21, Hoyle Street, Radcliffe, Manchester.

TAPE RECORDS

FOREIGN LANGUAGES ON TAPE from 38s. 6d. French, Italian, Spanish, German, Russian. Full money-back guarantee. — Details from Visaphone Co. Ltd., 28, Brookland Hill, London, N.W.11.

PRE-RECORDED TAPES. Unique complete catalogue listing all makes, Mono, Stereo, 7½ and 3½ ips, including World Record Club tapes. Call for FREE copy or send 1s. mailing fee.—Dept. T.R.I., Teletape Ltd., 33, Edgware Road, W.2. PAD 1942.

SLEEP LEARNING. Of fascination to all T.R. enthusiasts. Send 6s. 6d. for book. Refund guarantee. York House, Huddersfield.

TAPE RECORDINGS. World-famous Hypnotist and Harley Street Psychoanalyst, W. J. Ousby (Instructional Recordings). Self-Hypnotism and Yoga for increasing confidence, overcoming inferiorities, lessening nervous tension. Send name and address for list of Mr. Ousby's tape recordings. Details sent in plain envelope without obligation. W. J. Ousby, Home Farm Estate, Northchurch, Berkhamstead, Hertfordshire.

TAPE TO DISC

J. & B. RECORDINGS. Tape/disc. Mobile unit. Quality recording. 14, Willows Avenue, Morden, Surrey. Mitcham 9952.

JOHN HASSELL RECORDINGS. Tape to Disc. 50-minute LPs—Lowest prices. Studio and mobile services.—21, Nassau Road, London, S.W.13. Riverside 7150.

TAPE TO DISC RECORDING
Reduced prices. Finest professional quality. 10-inch LP—35s. (32 mins.), 12-inch LP—40s. (45 mins.), 7-inch EP—17s. 6d.

48-HOUR POSTAL SERVICE
S.a.e for leaflet to Deroy Sound Service, 52, Hest Bank Lane, Hest Bank, Lancaster. Tel.: H.B. 2444.

TAPE-TO-DISC RECORDING SERVICE. All speeds. 50-minute LPs. Photographic sleeves with all recordings.—E.R.S., 162, Shirland Road, London, W.9.

TAPE EXCHANGES

FRIENDLY FOLK ASSOCIATION, Torquay (Est. 1943). Social introductions, Pen-friends, Book-lovers, Stamps, Photography. Tapesponding. Members 100 Countries.

"From Down Under" the Australian Tape Recordists' Association invites you to become a member of their World-Wide organisation. For details write The Sec., P.O. Box 67, Eastwood, N.S.W., Australia.

Make interesting new friends UK and overseas, all ages. Join Victory Club, 34, Honeywell Road, London, S.W.11. Details free. Established 20 years.

FOR SALE

Butoba MT5 Portable. Little used. Cost £76, sell £50 o.n.o. ELTHAM 9825 evenings.

For sale: 1961 4A Ferrograph, Cadenza microphone, accessories if required. Excellent condition, hardly used. All in, £58 o.n.o. D. Jones, 3, Sydney Road, Ramsgate.

Philips Transistor Recorder complete. Listed 24 gns., offered £14. London Area. Box 441.

Reflectograph 570, little used. Cost 149 guineas, accept reasonable offer. Box 440.

Truvox 4-track Stereo Tape Deck PD86 for sale. Surplus to requirements. Brand new, unopened; purchased 1963. £35. S.P. York House, Huddersfield.

Index to Advertisers

	Page
A. Brown & Sons Ltd.	4
Agfa Ltd.	3
Audio Electronics (Midlands) Ltd.	28
Berean Forward Movement	3
Brenell Engineering Co. Ltd.	2
City and Essex Tape Recorder Centres	9
Cosor Radio and Television Ltd.	20
Cussins and Light Ltd.	28
Daystrom Ltd.	6
Denham & Morley Ltd.	4
Educational Recordings Ltd.	26
Elstone Electronics Ltd.	7
E.M.I. Tape Ltd.	30
Fi-Cord International	8
Francis of Streatham	6
Grampian Reproducers Ltd.	5
Hamilton Electronics	29
Hi-Fi Centre Ltd.	27
Highgate Acoustics	7
Howard Tape Recorders	5
Lee Electronics	27
Magnegraph	27
Massey's Centre of Sound	4
Rapid Recording Service	21
Recording Machines	29
R.E.W. Earlsfield Ltd.	35
Sheen Tape Recorder Centre Ltd.	27
Sound News Productions	21
Stereoelectrics Ltd.	35
Tape Recorders (Bournemouth) Ltd.	29
Tape Recorder Centre (Hafkax)	28
Tysonic	28
Uroko Sangyo	Back cover
Wellington Acoustic Laboratories Ltd.	26

Tape Exchanges

TAPE recorder owners who wish to contact others with similar interests to exchange news and views by tape are invited to send their name, age, address, special hobby or interest for this section.

The details, given below, also include speeds and spool size to be used, name of recorder, and special areas to be contacted.

(See form page 34)

Smith, Stewart (23). Headquarters 1 Division, B.F.P.O. 32. Boxing, football, pop music. 7½ ips. 3½-inch spool. Elizabethan Popular four-track. U.S.S.R., U.S.A., France, U.K. Letters not required.

Stevenson, Richard (36). 45, Whitehill Road, Crayford, Dartford, Kent. Photography, physical culture. 3½ ips. 5½-inch spool. Argyll and Sound Riviera. Male contacts only, letters not required.

Summerfield, David (47). "Alma" Mansions, Brent Street, Hendon, London, N.W.4. Travel, nursing, Bible, carpentry. 7½, 3½ ips. 7-inch spool. Reps R40. U.K., U.S.A., Australia, Israel.

Sypkens, Jan (22). 91, Rapson Road, Durban, Natal, South Africa. Jazz. 3½ ips. 5½-inch spool. Sierra Type SA6137, four-track. U.K., Belgium, Holland, U.S.A., Canada, New Zealand.

Tallis, Eric (30). 130, Kidderminster Road, Bewdley, Worcestershire. French and German languages, music. 7½, 3½, 1½ ips. 7-inch spool. Stella and Robuk RK3.

Tye, David J. (22). 17, Middleton Avenue, Greenford, Middlesex. German language, pops, Buddy Holly records. 7½, 3½, 1½ ips. 7-inch spool. Germany, U.S.A., U.K.

van Niekerk, Marthinus W. (43). Box 111, Springfield, Johannesburg, South Africa. 8 mm. cine, 35 mm. photography, travel, music. 3½ ips. 5½-inch spool. Sierra Type SA6137A.

Visser, Gordon Alec (30). 72, Kelvin Power Station, P.O. Box 311, Kempton Park, Transvaal, South Africa. Photography, all music. 3½ ips. 5½-inch spool. Sierra, four-track.

Wahle, Klaus (37). Red House, Broad Street, Presteigne, Radnor, Wales. Cacti and other succulents. 1½ ips. 3-inch spool. Philips EL3585, battery portable. English and German speaking contacts required.

Walford, John (30). 68, Southcrest Road, Lodge Park Estate, Redditch, Worcestershire. 35 mm. photography, 8 mm. cine, motor-racing, fishing. 7½, 3½ ips. 8½-inch spool. Ferrograph, Fi-Cord 1A, Truvox.

Vulliamy, Lydia (28). 154, Corbyn Street, London, N.4. Oriental and early music, serious films. 7½, 3½ ips. 7-inch spool. Fi-Cord 1A, and Grundigs TK8 and TK20.

Washbourne, Alec (35). 38, Upper Walthamstow Road, Walthamstow, London, E.17. Boys' clubs (12-18 years), shows, films, pop music. 7½, 3½, 1½, 15/16ths ips. 7-inch spool. Philips EL3549. Male contacts only in U.K.

Whittington, Philip (35). 44, Castle Street, Barry, Glamorgan, Wales. Travel, drawing, all music. 3½ ips. 5½-inch spool. Grundig TK23.

Wood, Eric (73). Vingaker, Sweden. Music. 3½, 1½ ips. 7-inch spool. Philips EL3542, Grundig TK42, four-track. English and Swedish spoken.

TEENAGE EXCHANGES

Beck, Carol Ann (16). 40, The Ridgway, Sutton, Surrey. Historical buildings, cycling, light and classical music, radio and TV. 7½, 3½, 1½ ips. 7-inch spool. Robuk RK3. Letters first please.

Beckwith, J. A. (18). 83, Hundens Lane, Darlington, Co. Durham. Pop music, not jazz. 7½, 3½, 1½ ips. 7-inch spool. Carousel recorder. Female contacts in U.K. preferred.

Clinton, Peter B. (19). 31, Kenlon Road, London, S.W. 17. Pets, conversation, pop music, football, cricket. 3½ ips. 3½-inch spool. International, battery portable. U.K., Australia. 18-22 age group.

David, T. (15). 24, Farm Avenue, London, N.W.2. Gardening, radio, models. 7½, 3½ ips. 7-inch spool. Australia, New Zealand.

Dewar, John (18). 28, Sunridge Avenue, Luton, Bedfordshire. Fishing, most music, not jazz. 7½, 3½, 1½ ips. 7-inch spool. Stellaphone ST455, four-track. Female contacts preferred.

Duxbury, Ronnie (14). 42, Walton Lane, Barrow-in-Furness, Lancashire. Films, sport, golf. 7½, 3½, 1½ ips. 7-inch spool. R.G.D. 103.

Garrick, Roderick and Brian (15 and 16). 12a, Belle-Vue Road, Paignton, Devon. Camping, pop music. 3½, 1½ ips. 5½-inch spool. Westminster and International. U.S.A., U.K., Australia.

Greenwood, John R. (18). 9, Hirst Grove, Hebdon Bridge, Yorkshire. Journalism, small group jazz, pop music, rugby. Female contacts preferred.

(Continued on page 34)

ADVERTISEMENT INQUIRIES SERVICE

This is a special service for readers of TAPE Recording Magazine. It enables you—without cost—to get fuller information about those products in which you are particularly interested. Fill in one coupon below for each inquiry, writing in your name and address in each case. Then cut out the whole of this section, following the dotted line, fold as indicated overleaf, and post to us.

<p>I should like further information about the</p> <p>(product) mentioned on page.....of the issue of TAPE Recording Magazine.</p> <p>NAME</p> <p>ADDRESS.....</p> <p style="text-align: right;">June 1963</p>	<p>I should like further information about the</p> <p>(product) mentioned on page.....of the issue of TAPE Recording Magazine.</p> <p>NAME</p> <p>ADDRESS.....</p> <p style="text-align: right;">June 1963</p>
--	--

<p>I should like further information about the</p> <p>(product) mentioned on page.....of the issue of TAPE Recording Magazine.</p> <p>NAME</p> <p>ADDRESS.....</p> <p style="text-align: right;">June 1963</p>	<p>I should like further information about the</p> <p>(product) mentioned on page.....of the issue of TAPE Recording Magazine.</p> <p>NAME</p> <p>ADDRESS.....</p> <p style="text-align: right;">June 1963</p>
--	--

<p>I should like further information about the</p> <p>(product) mentioned on page.....of the issue of TAPE Recording Magazine.</p> <p>NAME</p> <p>ADDRESS.....</p> <p style="text-align: right;">June 1963</p>	<h2 style="text-align: center;">BRITISH AMATEUR TAPE RECORDING CONTEST 1963</h2> <p>I have read the preliminary details regarding the British Amateur Tape Recording Contest 1963 and would like to receive full details and an entry form</p> <p>NAME.....</p> <p>ADDRESS</p> <p style="text-align: right;">June 1963</p>
--	--

Tape Exchanges

(Continued from page 33)

Hodson, Terence (16). 6, Abbots Street, Bloxwich, near Walsall, Staffordshire. All music. 3½ ips. 5½-inch spool. Regentone. **U.K.**

Kinchin, Michael (19). "Deganwy," Tamworth Road, Bassetts Pole, Birmingham, Warwickshire. Satire, pop music. 7½, 3½, 1½ ips. 7-inch spool. Cossor CR1602. four-track. **Germany, U.K., U.S.A.**

Maddison, Robert John (19). 51, Beaufort Street, Southend-on-Sea, Essex. Dancing, all music except modern jazz. 7½, 3½, 1½, 15/16ths ips. 7-inch spool. Philips EL3549, four-track. **France, U.S.A., U.K., Australia, Germany.** Female contacts similar age preferred.

McLuckie, Stephen (15). 83, Loanhead Street, Coatbridge, Lanarkshire. Languages, pop music, cinema. 7½, 3½, 1½ ips. 7-inch spool. Ferrograph recorder. **France, U.S.A.**

Mautner, Brian E. (19). 37, Hawkshead Street, Southport, Lancashire. 8 mm. cine, dancing. 3½ ips. 5½-inch spool. Defiant T11.

Pegden, Richard (17). 32, Dudley Road, Folkestone, Kent. Cine photography, most sports, all music, chess. 3½ ips. 5½-inch spool. Fidelity Argyll Minor. **U.S.A.**

Pocklington, Michael (18). 24, South Street, Boston, Lincolnshire. Still photography, amateur dramatics. 7½, 3½, 1½ ips. 7-inch spool. Telefunken 95. **U.S.A., Germany.** Female contacts preferred.

Rugman, David. 63, Chakeshill Drive, Henbury, Bristol, Gloucestershire. Reading, dancing, all music. 15, 7½, 3½, 1½ ips. Grundig TK35.

Smith, David R. (16). "Glenhurst," 26, Tansley Hill Road, Dudley, Worcestershire. French and German languages, music, radio. 7½, 3½ ips. 5-inch spool. Sound 444. Not **U.S.A., U.K.**

States, George (18). 54, Uphill Grove, Mill Hill, London, N.W.7. Theatre sound effects, biology, genetics, psychology, classical music, not opera or folk. 4½, 3½ ips. 7-inch spool. Grundig TK830/3D. **Malaya, Japan, Australia, U.S.A.**

Stockbridge, Jeremy (19). 74, Elm Walk, London, S.W.20. Humour, electronics, cricket, bridge, chess, folk music. 7½, 3½, 1½ ips. 7-inch spool. Home-built recorder. **U.K., U.S.A.** Female contacts, similar age preferred.

Tarr, D. (19). 28, Wolsy Road, Ashford, Middlesex. Sound effects. 3½ ips. 7-inch spool. Grundig recorder. **Norfolk Broads.**

Vries, D.no de (20). Seranostreet 26, Willemstas, Curacao, Neth. Antilles. Unusual tapes, sound effects, tape plays, short stories, photography, films, pop music. 7½, 3½, 1½ ips. 7-inch spool. Uher Stereo-Record III. 2 and 4-track, mono or stereo. **U.S.A., Italy, England, Holland.** Female contacts preferred. Letters not required.

Waddell, John (19). 84, Austin Street, Lane Cove, New South Wales, Australia. Tennis. 3½ ips. 5½-inch spool. Grundig Recorder.

Williams, Roy (17). 137a, Church Road, Hove, Sussex. Sound effects, radio, hi-fi, jazz music. 7½, 3½ ips. 5½-inch spool. Kolster-Brande RT20. **U.K., France,** female contacts preferred.

FAMILY EXCHANGES

Allen, Ken (38). 18, Godfrey Close, Stevenage, Hertfordshire. Family, all music, general interests. 3½ ips. 7-inch spool. Philips EL3541. **Germany, U.S.A., U.K.**

Nye, Mr. and Mrs. R. J. H. (26). 49, Ousedale Close, Lewes, Sussex. Music, records, handicrafts. 7½, 3½, 1½ ips. 7-inch spool. Elizabethan FT3, four-track. **U.K., U.S.A., Belgium, Holland, Sweden, France, Germany, Norway.**

Tape recorder owners wishing to make contact with others of similar interests are invited to complete and return this form. (BLOCK LETTERS PLEASE).

Name

Address

..... Age.....

Special interests

.....

Speeds to be used..... Spool size.....

Recorder owned.....

Special areas to be contacted

(Unless otherwise stated, I am prepared to accept tapes from any part of the world).

FLAP B

SECOND FOLD HERE

NO POSTAGE
STAMP
NECESSARY
IF POSTED
IN GREAT
BRITAIN OR
NORTHERN
IRELAND

BUSINESS REPLY FOLDER
Licence No. ND 922

TAPE RECORDING MAGAZINE
7. TUDOR STREET,
LONDON E.C.4.

THIRD FOLD HERE

FLAP A

FIRST FOLD ALONG THIS LINE

Fold along lines as indicated and then tuck Flap A into Flap B.

CUT ALONG DOTTED LINES

BRITAIN'S LARGEST PART EXCHANGE

SPECIALISTS

- ★ OFFER THE BEST POSSIBLE ALLOWANCE ON YOUR TAPE RECORDER, RECORD PLAYER, RADIO, HI-FI ETC.
- ★ LARGE STOCKS OF MOST UP-TO-DATE MACHINES, 300 TAPE RECORDERS TO CHOOSE FROM

APPOINTED AGENTS FOR:

FERROGRAPH, PHILIPS, BRENELL, REVOX, REPS, AMPEX, SONY, SIMON, AKAI, BUTOBA, COSSOR, ELIZABETHAN, GRUNDIG, REFLECTOGRAPH, TANDBERG, TRUVOX, TELEFUNKEN, UHER, FI-CORD, ROBUK, FERGUSON, VORTEXION, OPTACORD, etc.



ALL GOODS AVAILABLE ON OUR FAMOUS
NO INTEREST TERMS

10% deposit balance 12 months, 18-24 months terms available
OUR MAIL ORDER DEPARTMENT COVERS THE WHOLE COUNTRY. FREE DELIVERY. WRITE, PHONE OR CALL FOR A QUOTATION ON YOUR MACHINE. LARGE SELECTION OF USED TAPE RECORDERS

REW EARLSFIELD Ltd. Telephone: BALHAM 7710
266 UPPER TOOTING RD., LONDON, S.W.17.

The Berean (NON-SECTARIAN NON-DENOMINATIONAL) Forward Movement

Loan of over 700 reliable expositions of the Bible available on tape (3½ ips) for cost of postage only (free to the blind and infirm). Invaluable to all Christians, from teachers to tyros; for Bible Study groups or private meditation. Supporting literature also available. Send for free, complete list of tapes and literature to B.F.M. "Eastgrove," Marsham Way, Gerrards Cross, Bucks.

Invitation to Sound Reality

High Fidelity Equipment should bring to you the closest possible approach to the original sound . . . but in choosing we have to bear in mind your own individual requirements.

Let us assist you with a well chosen selection of equipment which can give you quick and accurate comparisons under the right conditions.

Specialist in High Fidelity Sound.

H. D. KIRK

Stereolectrics
LIMITED

Phone: 23093

150 HIGHER BRIDGE STREET

BOLTON

Hi Fi R.T.C. PLAYRITE TAPE

for **SOUND-PERFECTION**



Magnetic Recording tape

Hi Fi R.T.C. Playrite is one of the finest magnetic recording tapes ever produced. Premium quality makes it the logical choice for the home recording enthusiast as well as the most devoted professional. Magnificent results in all high fidelity monophonic and stereophonic recording applications are assured through critical control and testing procedures.

Playrite Tape is splice-free, wound on non-warp, non-squeal reels and includes Leader at both ends to protect and facilitate labelling of your recordings. Playrite Tape is fully guaranteed.

			Retail
STANDARD (Red Seal)	5in.	600ft.	14/-
	5¾in.	850ft.	18/-
	7in.	1200ft.	22/-
LONG PLAY (Green Seal)	5in.	900ft.	18/-
	5¾in.	1200ft.	22/-
	7in.	1800ft.	30/-
DOUBLE PLAY TENS. MYLAR (Yellow Seal)	5in.	1200ft.	32/-
	5¾in.	1800ft.	38/-
	7in.	2400ft.	48/-

PLAYRITE a name to remember

Distributed by:

K. POPPER (R.T.C.) LTD. RADIO and ELECTRICAL WHOLESALERS
55, CHAPLIN ROAD, LONDON, N.W.2. Telephone: WILlesden 2141/2/3/4

Engineering specialists in portable tape recording systems.

UROKO

PRE-TESTED FOR DURABILITY A PRECISION, COMPACT TAPE RECORDER



MODEL UT-50 5-TRANSISTOR

- Recording Time: 40 minutes (Double Track)
- Freq.: 200—7000 CPS
- Dimensions: 218mm x 218mm x 68mm
- Weight: 2.94 lbs. (1.3 kg)
- Accessories: Remote Control Microphone with Telephone Pick up, Earphone, Batteries (UM-2 x 2 & BL-006P x 1), 200 ft. tape with 3" Standard Reel.



MODEL MR-100 6-TRANSISTOR

- Recording Time:
1.7/8in./per Sec. . . . 180min. (Double Track)
3.3/4in./per Sec. . . . 90min. (Double Track)
- Freq.: 250—7000 CPS (at 3.3/4 ips.)
- Dimensions: 95 mm x 231 mm x 212 mm
- Weight: 2.8 kg. (5.4 lbs.)
- Accessories: Dynamic Microphone, Earphone, Batteries 9 V (UM-1 x 6 & UM-3 x 6), 300ft. tape, 3" Standard Reel.



MODEL UT-808 5-TRANSISTOR

- Recording Time: 95 mm/per Sec. . . . 30 min. (Double Track)
47.5 mm/per Sec. . . . 60 min. (Double Track)
- Freq.: 200—7000 CPS
- Dimensions: 195mm x 186mm x 50mm
- Weight: 3.3 lbs. (1.5 kg)
- Accessories: Remote Control Dynamic Microphone with Telephone Pick up, Earphone, Batteries (UM-3 x 6 & BL-006P x 1), 300ft. tape with 3" Standard Reel.

Recipient of the Tokyo Metropolitan Government Award for quality in export products.



UROKO SANGYO KAISHA, LTD.

Shimbashi Kikue Bldg., No. 4-5, Shiba-Shimbashi, Minato-ku, Tokyo, Japan
Cable Address: "UROKOTRADE TOKYO"