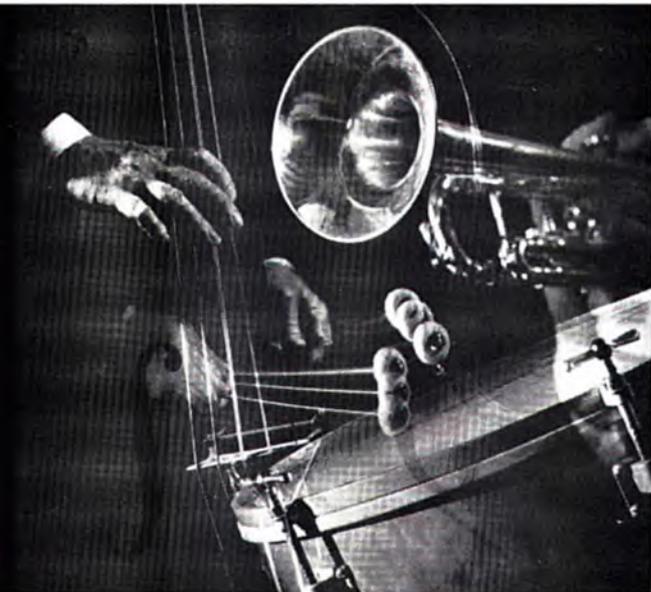


# TAPE

## RECORDING AND HI-FI MAGAZINE



# W



This is the Walter 505 High Fidelity at 55 guineas. Ask to see the 303 De Luxe, at 42 guineas, as well as the amazing 101 costing 29 guineas.

### RECAPTURE IT ALL WITH A WALTER!

Life's fuller and happier when you own a Walter tape recorder. There's a model to suit every purpose and every purse. Go and hear them all; your Walter dealer is waiting to give you a demonstration.

Every model is complete with tape, microphone, radio/gram, recording lead and 12 month guarantee.

Write for Free folders on all the Walter models to WALTER

# WALTER

tape  
recorders

INSTRUMENTS LIMITED MORDEN · SURREY Telephone: DERwent 4421

BRITAIN'S LEADING PUBLICATION IN THIS FIELD

**1/6**  
SEPTEMBER 1958

# Yours faithfully

**EAP**

## **Elizabethan**

### **ESSEX**



An outstanding achievement of British design and technical skill, the famous Essex has led the field since its first appearance. 3 speeds and 3 speakers ensure the finest possible sound reproduction for any subject. Amazingly versatile, the Essex can be used as recorder, reproducer and independent amplifier. Incidentally, an Essex will be the first prize in the National Tape Recording Contest, to be judged at the Radio Show.

**65 GNS**

including tape and accessories  
Optional microphones:  
Cadenza ribbon—10 gns.  
High-quality crystal—5 gns.

### **MAYFAIR ESCORT**

A beautiful console version of the Essex, incorporating all its technical features. The Mayfair has an exquisitely designed contemporary cabinet of Bubinga and Sycamore woods, made to the highest standards of craftsmanship, and detachable legs enable it to be used either free-standing or as a table model. The EAP F.M. Tuner Unit can easily be fitted to form a complete hi-fi radio/tape installation.

**72 GNS**

including tape and accessories  
Optional microphones:  
Cadenza ribbon—10 gns.  
High-quality crystal—5 gns.



The sensational new Escort is the most talked-about recorder of the day. Neat, light and good-looking, it has every possible recording facility, including 3 speeds, 6 hours playing time, mixing, super-imposition and monitoring. Simple push-button controls make it a joy to use, and it has the superb hi-fi sound that one expects from the Elizabethan range.

**45 GNS**

including microphone, tape and all accessories.

See and hear the **Elizabethan** models at the Radio Show, Earls Court—Stand No. 416

EAP (Tape Recorders) Ltd Oldchurch Road Romford Essex Tel: Romford 62366/7

# New Magnafon plays stereo

The M1S with all the features of the M1 but with the addition of the stacked stereophonic head and an additional output from the second channel will be heard for the first time at the Radio Show 1958. Price to be announced. The latest M1 recorder with the Motek K9 tape deck featuring, three speeds, large spools, pause, digital counter, loud-speaker monitor will also be demonstrated.

Price 48 gns.



Radio Show—Stand 419

## **MAGNAFON** LIMITED

For details please write to:

Magnafon Ltd, 3 Baggally Street, London, E.3.  
Tel: ADVance 3112



### THE MAGNAFON '58'

another highly successful tape recorder with very advanced push-pull bias and erase oscillator. Bass and treble controls. Monitor through own built in twin speakers. Price, inclusive of microphone and spool of tape, 62 gns.



### THE MAGNAFON PRE-AMPLIFIER

latest Collaro type transcriptor, with complete recording amplifier and playback pre-amplifier, fully equalised at all three tape speeds. Is self-powered and needs only connection to amplifier or radio. Price 40 gns.

With meter 50 gns.

# five winners

## in the same race?

Tape recorders come in all shapes and sizes these days—quality is often just as varied. The five recorders featured here are all, undeniably, in the 'top quality' class, although they differ in essential features and purposes. One or other of them may exactly fulfil your requirements!



### HARTING

The Harting Portable tape recorder is a two speed model— $7\frac{1}{2}/3\frac{3}{4}$  i.p.s. It gives exceptionally good quality and is very simple to operate. Its handsome appearance and magnificent performance make it one of the finest recorders available

Price 82gns.

### TANDBERG

The new Tandberg de luxe recorder also reproduces stereo tapes. It is a three speed recorder— $7\frac{1}{2}$ ,  $3\frac{3}{4}$  and  $1\frac{7}{8}$  i.p.s. on 7in. reels and has a precision place indicator. It is housed in a polished, veneered cabinet and there is a pigskin leathercloth carrying case.

Price 114gns.

For stereo reproduction QM can supply suitable external speakers from 12gns.



### VERITONE VENUS

Something British—and really new! Here is a first-class  $7\frac{1}{2}/3\frac{3}{4}$  i.p.s. recorder built into a handsome 'chairside' cabinet. Separate record and replay heads and amplifiers—2 speakers—storage space for mic., tapes, etc.—the Veritone 'V' F.M. radio unit (16 gns.) slips into one of the compartments!

And all for 66gns.!



### STUZZI MAGNETTE

Some comparatively tiny recorders have made sacrifices in quality. The Stuzzi, however, is a really efficient compromise giving genuine portability and a first-class performance. It is fully transistorised and battery operated—the running cost is about 1d. an hour!

Price 69gns.



### MAGNAFON M.1

The new improved Magnafon M.1 gives even better quality at the same price—48gns. This British made recorder incorporates a new Acos crystal microphone and the newest 3 speed MOTEK K.9 deck with record safety catch. An interesting feature is that it will play pre-recorded tapes.

### TAPE LIBRARY

- Here is a new Q.M. service that opens up a whole world of entertainment for tape enthusiasts. At reasonable charges you can hire one, two or three music recorded tapes—and you can change them up to twelve times within a six month period. Ask for details and charges.

- Q.M. stock all the accessories the tape enthusiast requires.

**Quality Mart**

8, DARTMOUTH PARK AVENUE, LONDON, N.W.5

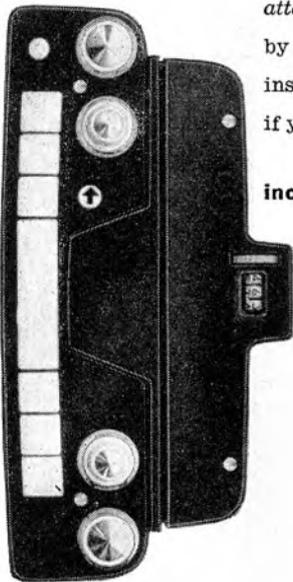
GULliver 1131

Our showroom is open for demonstrations daily 9-30-6. Friday, 1-30-9. Closed Monday.

Only 16 minutes from Charing Cross by Northern Underground or Bus 27, 134, 137 to Tufnell Park Station, thence 4 minutes' walk.

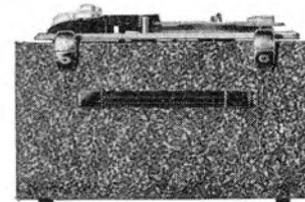
## scintillating sound

There are more features in the new Simon SP.4 than have ever before been gathered into any portable tape recorder. Exclusive to the SP.4 is the fully 'push-button-controlled' Simon Automatic Deck and a 10-watt ultra-linear amplifier. Automatic tape reversal allows not only 3 hours' continuous recording but continuous replay indefinitely *without attention*. This technical excellence, matched by elegant styling, makes the SP.4 an instrument that you will be thrilled to hear if you really appreciate first-class sound.



**incorporating the new Simon fully automatic tape deck and these outstanding features:**

- AUTOMATIC TAPE REVERSAL** *without button pressing or spool transposing*
- CONTINUOUS REPLAY** and 3 hours continuous recording without attention
- 3-WAY MIXING FACILITIES** on both record and playback
- 10 WATTS OUTPUT** from ultra-linear push-pull amplifier
- PUSH-PULL OSCILLATOR** reduces noise and hum to minimum
- BASS AND TREBLE LIFT AND CUT** with independent controls
- ERASE/RECORD** 'safety button'
- SYNCHRONOUS MOTOR** mains frequency-controlled for accurate speed
- ACCURATE TAPE POSITION INDICATOR** based on linear tape scale
- CATHODE RAY MAGIC EYE** for 'pin-point' modulation



The lid is detachable. Both case and lid are covered with genuine Rexine in attractive dual tone colours. Styling: Peter Bell, M.S.I.A.

# simon SP.4

high fidelity **TAPE RECORDER**

### CADENZA

ribbon microphone

... to do justice to the excellence of the SP.4.

Dual impedance head, output sensibly flat between 50-12,000 cps. In handsome presentation case, head only 8½ gns. or with tripod desk stand 10 gns.



Send this coupon now for illustrated literature on the Simon SP.4

**To SIMON SOUND SERVICE LTD.**

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

Please send me literature on the Simon SP.4

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ADDRESS \_\_\_\_\_

**95** GNS

My nearest dealer is

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E.8.

# Another winner from Wyndсор



**The  
Wyndсор  
'Viscount'—a  
brilliant new  
portable at  
only 49 gns.**

The Wyndсор "Viscount" is the brilliant new portable the electronic industry is talking about: brilliant in design and brilliant in performance. The Wyndсор Recording Company—makers of the Wyndсор "Regent" one of the most popular tape recorders ever—have excelled themselves in the "Viscount" by creating a successor worthy to come from the same stable. Yet they have kept the cost below fifty guineas, which is an achievement in itself.

It has three speeds—15", 7½" or 3¾" per second—and carries up to 7" spools (giving up to 3 hours recording on one L.P. tape) with location of position by digital counter.

The two tracks are immediately available by push-button control; there is an independent set of "Record/Play-back" and "Erase" heads for each track, halving the wear and facilitating instantaneous switching from one to the other.

Additional facilities include the speaker's being detachable. This means that cine-camera enthusiasts—and others—can place the source of the sound well away from the point of operation.

There are two inputs, one high and one low gain. And only two electronic controls; a master gain control and a tone control.

Every recording can be monitored because the moment you push the "Record" button, the tone-control automatically becomes a volume-control for hearing whatever you are recording at the same time. At this point the "Viscount's" frequency response conforms to C.C.I.R. standards.

Finally, the instrument can quite simply be used either in conjunction with a subsequent amplification system if desired, or as a self-contained straight-through amplifier.

The "Viscount" looks good, too. It is tastefully styled in coffee and cream colours with gold-coloured inlay and grill and matching cream-and-gold controls.

It is fitted complete with a 7" spool of Emitape and an "Acos" high-sensitivity crystal microphone in matching colours. The price, remarkably, is only 49 guineas.

## BRIEF TECHNICAL DATA

**Frequency Response:** 50 c/s to 12 kc/s ± 3dB at 7½ ips.  
50 c/s to 9 kc/s ± 3dB at 3¾ ips.

**Inputs:** Two: High and Low sensitivity both at 1 megohm.

**Outputs:** Low impedance: 3 ohms feeding 10" × 6" elliptical Goodman Speaker. High impedance: 1v at 10 K ohms (conforming to C.C.I.R. standards).

**Record/Playing Time:** ½ hour at 15 ips. 1 hour at 7½ ips.  
2 hours at 3¾ ips. Using long-play tape times are increased by 50 per cent.

**Weight:** Approximately 35 lbs.

## THE WYNDSOR RECORDING COMPANY LIMITED

2, Bellevue Road, Friern Barnet, London, N.11 : Telephone: ENTerprise 2226/7 : Telegraphic Address: Wyndreco

## THE WYNDSOR DAUPHIN

The Wyndсор Dauphin is a logical and up-to-date approach to the problem of getting hi-fi performance without the usual hi-fi paraphernalia: superb reproduction with a single piece of equipment instead of having to connect up two or three separate items. Be sure to see the Wyndсор Dauphin before you invest in a tape recorder. We'll be pleased to send you a leaflet giving you full particulars.

### BRIEF TECHNICAL DATA

Tape Speeds..... 7½ and 3¾ ips.  
Frequency response... 50—15,000 c/s ± 3dB at 7½ ips.  
50—8,000 c/s ± 3dB at 3¾ ips.

Wow and Flutter..... better than 0.1 of 1 per cent.  
Signal/Noise ratio ... better than 40dB unweighted.

Output ..... 3 watts ultra-linear at 15 ohm.  
3 matched speakers, base, elliptical and tweeter. Actual tape-monitoring through third head. Independent record and playback amplifiers.

**89 GNS.** Complete, including Stand, Microphone and Tape.

# Fi-Cord

## hi-fi tape recorder



- weighs only  $4\frac{1}{2}$  lbs. ★
- 50 to 12,000 cps  $\pm$  3db. ★
- $7\frac{1}{2}$  and  $1\frac{7}{8}$  ips. ★
- completely transistorised ★
- rechargeable batteries ★

### Fi-Cord recorder complete with

- ★ dynamic microphone
- ★ long-play tape
- ★ batteries
- ★ and battery charger

FOR FULL DETAILS WRITE TO:

**FI-CORD LTD. 40a, DOVER STREET, LONDON W.1**

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**79**  
guineas  
complete

# Hi-fi at Low Cost



- 2 Directional
- 3 Speeds
- Quality Reproduction
- 3 Hours Maximum Playing Time
- Built in MIXER UNIT
- Portable
- Two-Tone Styling

**56 GNS. includes TAPE & MICROPHONE**

THE contemporary TR7m by—  
**kurland**

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## MICROPHONES FOR RECORDERS

The quality of reproduction from your recorder depends upon the type and quality of the microphone used with it. That is why it is best to specify LUSTRAPHONE. There are a number of models particularly suitable for recorders of all types at prices from 67/6 for the popular all-purpose Lustrette Moving Coil Microphone to £9.19.6 for Model VR/53 Ribbon Velocity Microphone for broadcast studio standards. Shown here is Model VR/64 Ribbon Velocity Microphone at £7.17.6.

Brochure showing complete Lustraphone range free on request. We will also gladly advise on the Lustraphone Microphone best suited to your requirements.



**STAND 445**  
Audio Hall  
National Radio Show  
Earls Court



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## TAPE RECORDERS ON INTEREST-FREE TERMS

Yes, no interest, and that is not all—for my personal attention, advice, and help, are freely given. Full demonstrations at any time (evenings and weekends by arrangement) and in addition to the superb Harting you can see and hear a selection of the most interesting recorders available. Remember, I am here to help you. Leaflets gladly sent if you are unable to call.



COME AND SEE THE MAGNIFICENT NEW HARTING HM. THE RECORDER WITH THE OUTSTANDING SPECIFICATION.

● We are also demonstrating the Dulci Harting Deck with pre-amplifier.

● C.Q. Speakers.

● The Wyndsor Dauphin and Console Model with the Harting Deck.

● The Tandberg recorder Stereophonic reproducer.

Model	8 Monthly Payments		Cash Price
	£ s. d.	£ s. d.	
Philips A.G.8109 .....	4 19 0	4 10 0	39gns.
Elizabethan Escort .....	7 5 0	5 0 0	45gns.
Verdik S.1 .....	7 5 0	5 0 0	45gns.
Magnafon .....	8 8 0	5 5 0	48gns.
Wyndsor Regent .....	8 8 0	5 7 6	49gns.
Grundig T.K.20 .....	8 10 0	5 10 0	50gns.
Dulci Harting Deck (with pre-amp.) .....	7 15 0	6 5 0	55gns.*
Saja Export .....	7 16 0	6 7 6	56gns.
Brenell 3 Star .....	7 18 0	6 12 6	58gns.
Veritone Venus .....	9 6 0	7 10 0	66gns.
Baird .....	10 7 0	7 10 0	67gns.
Brenell Mk. V with Mic. .....	9 9 0	7 17 6	69gns.
Truvox R2 .....	12 15 0	8 5 0	75gns.
Elizabethan Essex .....	14 2 0	9 0 0	82gns.*
Wyndsor Dauphin .....	15 9 0	9 15 0	89gns.
Reflectograph .....	18 14 6	10 0 0	94gns.*
Grundig T.K.830/30 .....	25 0 0	10 0 0	100gns.*

All machines are complete with tape and microphone, except those marked \*, which are less microphone.

Please note that the Dulci Harting Deck is for use only with existing Hi-Fi equipment and is supplied without mic. or tape.

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The Royal Opera Arcade lies behind Her Majesty's Theatre in the Haymarket. One minute from Piccadilly Circus or Trafalgar Square.

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*Only 46 guineas for the superb portable*

## “GAIETY”



The lowest-priced quality tape recorder at the Radio Show. The “GAIETY” gives the proven Motek deck push-pull oscillator coil and many other refinements in a strong, good-looking cabinet. When you buy “GAIETY” you buy top-line performance.

Before buying ANY Tape Recorder visit Stand No. 426 to see the magnificent **NEW “CONCERTO,”** the ultimate in tape recorders, together with a full range of Sonomag products. Price and full details of the “Concerto” will be announced at the show.

Stand No. 426  
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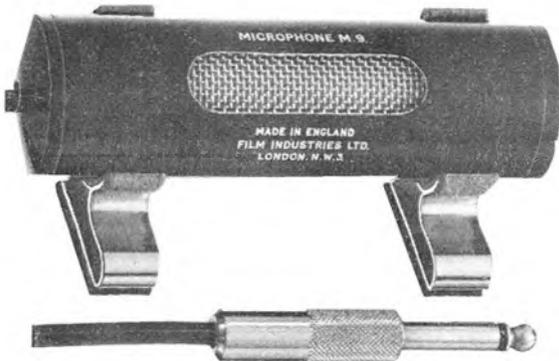
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*In this new Microphone—*

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The magnet system is very generous and comprises three substantial U magnets to provide the high field necessary for good frequency response and efficiency. The ribbon is of specially formed aluminium alloy 0.0001" thick.

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Here is presented in logical and concise development of thought, the fundamental principles of design and operation of the whole basic range of technically important electronic devices of the vacuum and the gas-filled type, and their application in practical electronic circuits. It has been written primarily for the student who wants an introduction to the subject, and will be of value to the research worker who requires to refresh his memory. It has been designed to meet an urgent need, for the field of electronic circuits and their practical application in research, tele-communication, navigation and industry has been growing rapidly in recent years, and existing textbooks are of too advanced a nature to be suitable for this purpose.

*With diagrams 21s. net*

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### Truvox R 2

Not a toy, but a high fidelity recorder of outstanding merit, with a specification comparable to instruments at much higher prices. 40-12000 cps ( $\pm 3$  db); 10 in. x 6 in. Rola Celestion L.S. (10,000 lines). Output 4 watts. 2 speed ( $3\frac{1}{2}$  in. and  $7\frac{1}{2}$  in. per sec.); 7 in. spools. Complete with microphone, 1,200 ft. tape also empty reel.

FROM  
**66 Gns.**  
COMPLETE

For full details see leaflet SH350.

Every make of Tape Recorder is available from our branches. Our experience and independent advice are freely available to all Tape Recorder enthusiasts.

Machine	Deposit		Nine Payments		Cash
	£	s. d.	£	s. d.	
Truvox R.2 (With Rev. Counter)	9	0 0	7	1 0	69 gns.*
Truvox R.2 (With Timing Scale)	8	13 6	6	14 10	66 gns.*
Walter 303	5	3 6	3	19 6	39 gns.*
Philips A.G. 8109	5	3 6	3	19 6	39 gns.*
Verdik	5	10 3	4	5 9	42 gns.*
Sound 777	5	15 6	4	9 10	44 gns.†
Elizabethan Escort	5	18 6	4	11 10	45 gns.*
Grundig T.K.20	6	11 6	5	2 0	50 gns.*
Veritone Type V	6	16 6	5	6 2	52 gns.*
Sound A.20	7	4 0	5	12 4	55 gns.*
Brenell 3 Star	7	12 3	5	18 5	58 gns.*
Elon J.C.20	8	10 3	6	12 9	65 gns.*
Philips A.G. 8108	8	2 9	6	6 7	62 gns.*
Elizabethan Essex	8	10 3	6	12 9	65 gns.†
Veritone Venus	8	13 6	6	14 10	66 gns.†
Baird	8	16 0	6	16 10	67 gns.*
Winston Thoroughbred	9	0 0	7	1 0	69 gns.*
Grundig T.K.8/3D	9	9 0	7	7 0	72 gns.†
Harting	10	15 3	8	7 5	82 gns.†
Wyndor Dauphin	11	13 8	9	1 9	89 gns.*
Grundig T.K.830/3D	13	2 6	10	4 2	100 gns.†

\*Including microphone †Less microphone.

Demonstrations daily; open until 6 p.m. Saturdays. Phone or write for the address of your nearest branch, or order direct from:

**TeleTape** Britain's Largest Tape Recorder Specialists

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Tel.: PADdington 1942



## Choosing a tape recorder is a serious business . . .

Upon the wisdom of your choice will depend the many hours of satisfaction and pleasure you have the right to expect. Before making your choice see and hear the Brenell first—consider the outstanding features of this truly remarkable machine.



The Three Star

*Brief Specification*

Maximum playing time: up to 6 hours • Rewind time: Approx. 55 seconds for 1,200 ft. tape • Tone Controls: Separate Bass and Treble on Playback • Frequency Range: 60—10 kc/s + or - 3db at 7½ i.p.s. • Monitor Socket: For high impedance 'phones  
Net Weight: 25 lbs approx.

# Brenell **tape** **recorders**

*Brenell performance is true-to-life performance*

Send for full details to Sole Manufacturers:  
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### Brenell ★★ ★ Three Star

- ★ Three recording speeds 1½, 3½, 7½ i.p.s.
- ★ Frequency compensation at all speeds
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- ★ Printed circuit amplifier
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- ★ Spool sizes up to 7 ins. to take standard pre-recorded tapes (All E.M.I. pre-recorded tapes are on 7 in. reels)
- ★ Pause control
- ★ Digital revolution counter
- ★ Modern style wooden cabinet designed for improved acoustic performance

## 58 gns.

Price includes Microphone, 7in. spool and 1,200 ft. Tape.

*For the professional recordist the*

### MARK 5 PORTABLE TAPE RECORDER

*Four recording speeds. 3 independent motors. Permits use of 8½ in. reels. Price including 1,200 ft. of tape 64 gns.*

Because the Mark 5 is of unit construction the following can be supplied as separate items for incorporation in your own equipment.

Tape deck with provision for extra heads	28 gns.
Tape Pre-amplifier Type T.P.2.	17 gns.
Power Unit T.U.2.	£4 18 0
Mixer Unit	£2 18 0

See and hear our full range of models at the  
Radio Show—Stand 440

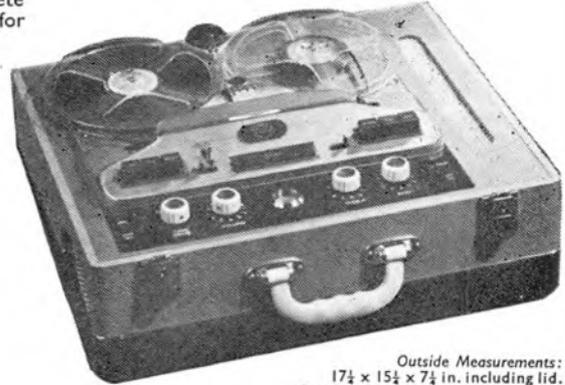
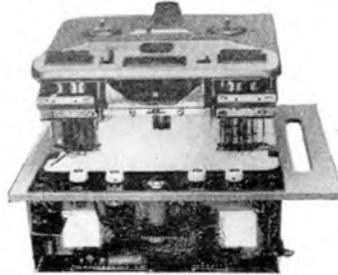
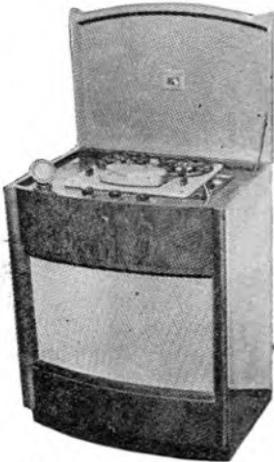
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# A SPECIAL OPPORTUNITY

**TRY THE "TUTOR"**  
recorder, using the Mark IV Collaro tape deck with digital counter

The amplifier used in the "Tutor," complete with power pack and ready-made wiring for Collaro Mark IV deck on grey rexine covered wooden framework. **Price £18 10s.** complete with instructions.



10 watt push-pull Hi-Fi Tape Recorder with 2 specially designed loud speakers. H.M.V. model

3033 fitted with our recording amplifier, separate recording and play-back channels, enabling recorded material to be instantly monitored on internal speaker system. In luxurious walnut cabinet. **Price £97 10s.** complete with Tape and microphone. Callers invited.

## TUTOR-TAPE COMPANY

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CABLES: TUTAPE, LONDON. TEL: GERRARD 3376



Outside Measurements:

17½ x 15½ x 7½ in. including lid.

Output: 5½ watts. Weight: 36 lbs.

In dual colours—Maroon and Grey.

Inputs: High impedance microphone and high/low impedance radio/gram.

Output: 3 ohm or 15 ohm (as ordered) for extension speaker, earphone monitoring.

PRICE **63 gns.** complete with Collaro ceramic crystal microphone and reel of tape.

**EXPORT AND TRADE ENQUIRIES INVITED**

## LEARN LANGUAGES WITH A TAPE RECORDER

15-lesson course - - £3 3 0

72-lesson course - - £6 6 0

Complete with handbook

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100 machines, 25 models on permanent demonstration in our showrooms \* Open all day Saturday \* Credit deals completed on the spot \* All accessories in stock or sent by Mail Order \* Main Agents for all the best makes.  
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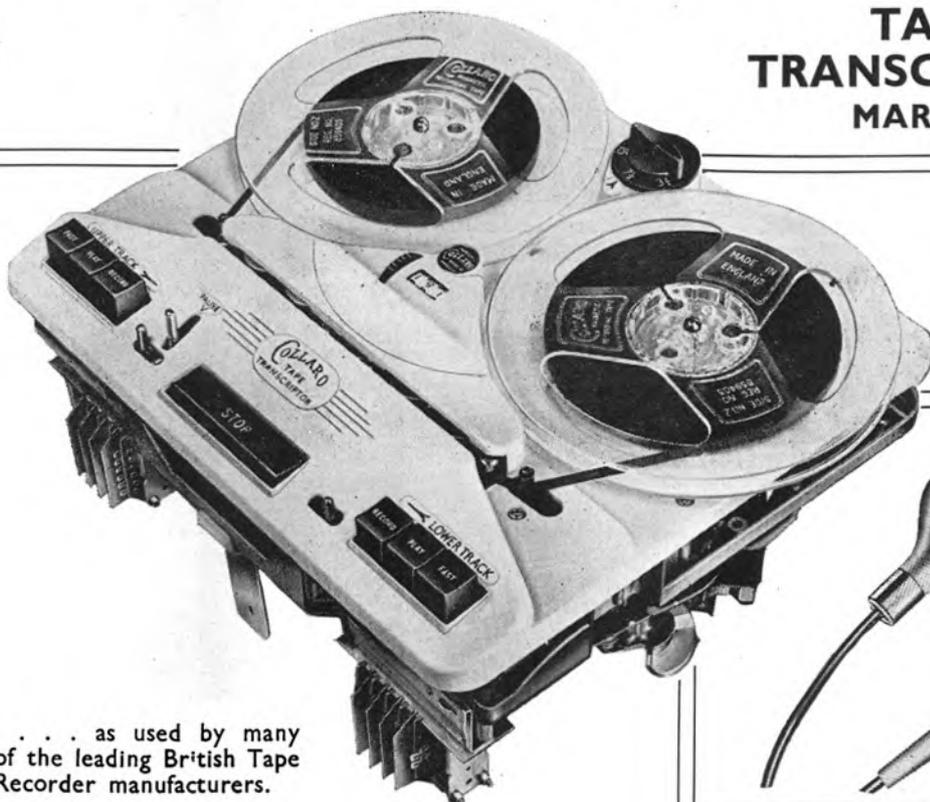
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TAPE RECORDER AND CAMERA CENTRE

# THE NEW IMPROVED COLLARO

## TAPE TRANSCRIPTOR MARK IV



. . . as used by many  
of the leading British Tape  
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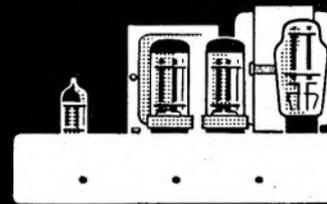
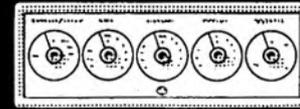
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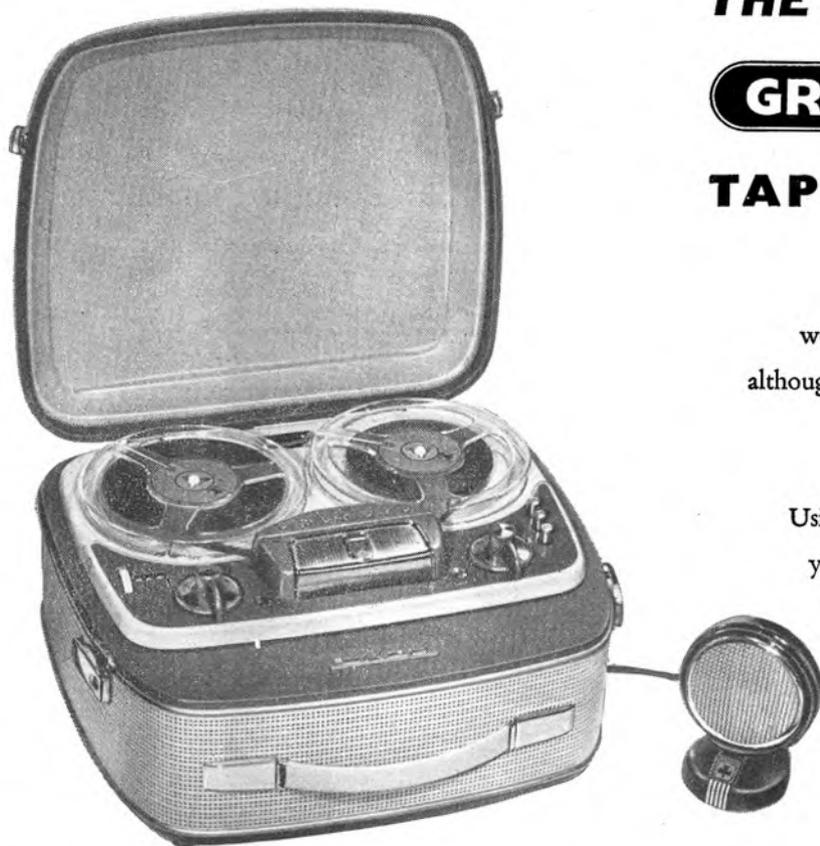
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THE EDITORS' VIEW

The Show and the Contest

THE RADIO SHOW is an annual stocktaking of progress. Here the new product finds its market, the tried and trusted article makes wider friends.

The introduction of an Audio Hall is a significant development. It places tape and hi-fi prominently before thousands of people who have never previously given these things much attention.

The enthusiast already has his own Audio exhibitions. Now the layman is given a chance. B.B.C. statistics prove that while sound radio audiences are dropping in numbers in the face of television competition, nevertheless the time that each person listens is increasing.

This suggests an increasing emphasis on *quality*. And that means that the demand in future will be for equipment that embodies the best design and performance obtainable at a reasonable price. Advance reports suggest that this year's Radio Show will open up exciting new prospects in this direction.

While on a long term basis the future of both sound and vision on tape look bright, on a shorter view there seems even more cheer for the sound connoisseur.

Tape—the "do-it-yourself" medium of the electronic world—takes significant strides forward at this year's Show. Two machines at under thirty guineas will be introduced to a wide public. This greatly extends the field of the tape recorder.

*Tape Hi-Fi Magazine* is privileged to play its own part at this year's Show. Apart from exhibiting, we shall be showing something of the work that amateurs can do with quite modest equipment.

This will be seen at the playback of winning tapes of the Second British Amateur Tape Recording Contest on Saturday, August 30th of which full details are given on page 25.

We are simultaneously publishing our first *Yearbook*. This is the only publication of its kind in the world to give the information which it does on tape recording and allied activities.

Once again we are breaking records with *Tape Hi-Fi Magazine*. This is our largest issue to date. And we shall shortly announce plans to reach an even wider audience.

---

J. R. KIRBY built his own special recorder

---



The author seen with his equipment on the moors near his North Country home

# HOW TO CATCH THE SONGS OF BIRDS

**I** FIND recording birds an extremely fascinating hobby, probably because I am interested both in the birds and in the equipment I use. I well remember the atrocious quality of my first efforts. I still have my first bird record—a distant cuckoo—made over seven years ago. Since then, I have had a lot of practice and done a great deal of work on my equipment.

A question I am often asked is: "What make of recorder would you recommend?" My answer is that I couldn't recommend any particular make, because my own equipment is home-made and I have little experience of commercially-made machines. This may seem a rather boastful and unhelpful reply; but so far as I know, there is no recorder on the market which fulfils all of what I consider are the minimum essential requirements for successful work with birds.

These requirements apply to the recording equipment, as distinct from anything that may be used to play back the results. Firstly, the recorder must be able to work without a mains supply of electricity. This requirement knocks out over 90 per cent of the recorders now on the market. Next in importance is that the recorder must be truly portable. Some manufacturers call equipment "portable" as soon as they fit a handle by which to carry it, even though it needs a Hercules merely to lift it. To be truly portable the recorder must be both light and easy to carry. Don't forget that a lot of birds live in very remote places. To get at them may call for an excursion up a mountain-side and over miles of moor. It is at the end of one of these excursions that you will realise whether your equipment is portable.

The field life of the equipment is important, too. It must be robust and able to stand up to a certain amount of knocking about, not to mention getting soaked. These are normal "occupational hazards." What I really mean by "field life" is the period during which the recorder will go on working without major attention, such as a battery replacement. My own experience is that a life of ten hours is ample whilst six is an acceptable minimum. Replacement batteries should, of course, be as cheap as possible. Rechargeable ones are the best, but these contain

corrosive liquids and must, therefore, be of the unspillable type.

When you want to record birds like the green woodpecker it is essential that your recorder is running continuously. This bird usually gives a short burst of song, lasting two or three seconds, quite unexpectedly. Then it remains silent for perhaps half an hour or more, sometimes less. It is annoying, to say the least, to miss a burst of song while you are changing a tape.

It is important that tape changes can be made quickly. I can do this in 15 to 20 seconds on my own machine. The type of spool has a great bearing on this. Some, I feel, were not designed with a view to easy threading. It is equally important that the equipment should be arranged so that it can be set up and working in a very short time. I can be recording seventy seconds after the word "go," including running out twenty yards of microphone cable. Whilst simple design is a great help towards speedy setting up, the real secret lies in practice and a definite order of drill for carrying out the various operations.

The recording amplifier should be as simple as possible and have the minimum of controls. Luxuries such as recording level indicators, whilst very useful, require power to keep them going and thus add weight and expense. Careful thought should be given to dispensing



The author's home-built equipment

## AND IN LIGHTER MOOD

with them. The bass response of the amplifier is not very important. Both the top response and the signal-to-noise ratio must be good. Very high sensitivity is vital. Together with its microphone, and under favourable weather and general noise conditions, the amplifier should be capable of recording the louder bird-songs at several hundred yards.

The basis of my own recorder is an old clockwork portable gramophone. The turntable has been replaced by a capstan which drives the tape and through a slipping belt, the take-up spool. This arrangement will probably horrify the wow and flutter merchants. But they should remember that this simple equipment is intended only for bird-song recording, where a little wow and flutter is hard to detect. I have adopted a tape speed of 6 ips giving adequate frequency response. It is also a little bit more economical in tape than the nearest standard of  $7\frac{1}{2}$  ips. Too much "top" is lost at lower speeds. The gramophone motor runs at about its normal speed, giving a running time of about four minutes on one wind. It would be very nice to have the deck electrically driven; but here problems of speed-governing and of batteries arise. I think that home-made electric drive, at the speed I use and with my five inch spools, would prove, on balance, just as heavy and certainly more expensive than clockwork.

Erasing is by permanent magnet. This is purely a matter of economics. Erase power from an oscillator would need more or heavier batteries. A magnet, properly adjusted, can give perfectly good results for all practical purposes. Recording birds is a game of compromises dictated by the depth of your pocket and the weight of equipment you are prepared to carry around the countryside. Magnet erasing is just one of these compromises.

I do not propose to describe my bias oscillator. It is of conventional design. Anyone embarking on the job of making one for this application should aim for lightness—not forgetting the batteries—and choose the minimum bias current required for satisfactory results. Having established a minimum bias current for a certain make of tape don't expect this to hold good for all makes. Furthermore don't forget that, as the oscillator batteries get older their voltages will fall, and this is likely to cause a fall of bias current.

I have used two recording amplifiers. The first I made a long time ago. It used valves with 6.3 volt heaters. At the time, these were the only valves available which were free from the microphony troubles which can be so embarrassing in high gain amplifiers. After microphony, the choice of valve was largely governed by the economics of power supplies. The valves were EF37A followed by EF37A into an ECC33 the second half of which served as the output. The circuit was quite conventional and largely



Reproduced by permission of the proprietors of "Punch"

followed the manufacturer's published recommendations. To keep this going called for 28 lbs. of batteries, which I carried around in a separate box. The amplifier was housed alongside the tape deck.

I have lately discarded this amplifier and the battery box and am using transistors. My total battery weight is now 3 lbs. This includes a pair of 90 volt HT batteries for the oscillator valve and a four cell lightweight rechargeable alkali battery of 4 ampere hour capacity. All these, and the amplifier and oscillator, are in the same box as the tape deck. When the transistor manufacturers get around to publishing information about oscillators suitable for my purpose, I will be able to throw out the last valve and, with it, 2 lbs. of HT batteries. The rechargeable battery will then take over completely and probably give a service life between charges of up to 40 hours. The main amplifier is that published by Mullard as circuit 4 on page 27 of their pamphlet *Transistors for the Experimenter*. The pre-amplifier is in every detail as described on page 61, Fig. 29, of *Transistor AF Amplifiers* by Jones and Hilbourne (Iliffe). The results I have been getting from transistors have more than justified the change from valves.

I find that the best microphone for bird recording is a moving coil loudspeaker. Extreme sensitivity, coupled with comparatively low cost, are the greatest advantages. I get best results from those with 4-inch diameter cone, or smaller. In fact, I have had excellent results using a TSL Lorenz LPH 65 "tweeter." One of these, mounted in an

(Continued on page 22)

SCIENTISTS TAPE  
THE "SILENT"  
SOUND OF  
BATS

while

J. R. KIRBY

catches the songs of birds

(Continued from page 21)

18-inch diameter parabolic reflector, is an extremely useful "weapon." Parabolic reflectors should, however, be used with discretion. Where a sound, like a cock pheasant crowing in a wood, is associated with a certain amount of reverberation from, say, surrounding trees, the use of a reflector should be avoided. If a reflector is used in such circumstances, the recording will lack naturalness as the reverberation effects will be missing. When not using a reflector, the best position for a speaker used as a microphone is on the ground with the cone facing the skies. It is a waste of effort to put it up a tree.

The biggest problems in recording birds are met in the actual making of the records out of doors. The most serious is the problem of unwanted noise. I put wind, aircraft, farm tractors, traffic and waterfalls all under the heading of "unwanted noise." There are many more. To the natural noises, such as wind and waterfalls, there is no ready-made solution, except to be patient. Wait till the wind goes down. I generally take off my pullover and wrap the microphone in it. If that doesn't keep the wind off, then I pack up.

From experience I find that the best "cure" for man-made noises is to get up very early in the morning. This has many advantages, not the least of which is that most birds sing best at daybreak. Furthermore, this is the time of day when the wind is usually the least nuisance. Dusk is also a rewarding time, though seldom as free from man-made noises as dawn. The problem of unwanted noise is often very exasperating and to cope with it demands a certain amount of ingenuity mixed with patience.

Always remember that most birds are very regular in their annual cycles of song and silence, and also that their day-to-day habits of singing at definite times from favourite perches, vary very little, especially in the early part of the breeding season. I think it is true to say that it is possible to find some individual of every species of bird singing at some time under ideal recording conditions. It is really a matter of being at the right place at the right time with the right equipment and, being faced with such a situation, knowing what to do. While good luck can play its part in producing these ideal situations, only experience of all the variables involved—including the birds—can teach you how to anticipate them.

My best advice is: be prepared for failures, not beaten by them; learn your birds; learn your equipment; and, above all, be patient.



Photograph by courtesy of "BASF Journal"

**B**ATS are equipped with their own sounding devices and have astonishing ability to take bearings by sound, comparing with the echo sounder, one of the great achievements of modern science.

It took quite a long time to discover the secret of bats' orientation by sound. For one and a half centuries research scientists racked their brains to find out how bats manage to avoid obstacles in complete darkness. First it was discovered that bats' "sixth sense" must be in their ears. Once their ears were blocked, their somnambulistic certainty was at an end; they became confused, hardly dared to take off, and if they did they collided miserably with walls and got entangled in outstretched strings. So came the idea that they take their bearings by "inaudible sound."

Ultrasonic waves vibrate too fast for our ears, but the auditory range varies from one person to another, and also from one species of animal to another. Among species which can hear ultrasonic waves is the silently-flitting bat. Its flight is silent only to our ears; other bats hear it very well, for when in flight the animal sends out continuous ultrasonic signals, whose echoes inform it of its environment.

Since by nature men cannot hear ultrasonic waves, it was necessary to heterodyne the bat sounds recorded by the ultrasonic microphone with an electrically-produced vibration of a slightly different frequency. The heterodyning of two waves leads to the creation of a third wave which is within the auditory range. Its vibration frequency is obtained by subtracting the vibration frequencies of the two original waves from one another. Thus, by means of sound-recorder and oscillograph, it was possible to study the orientation signals of bats and to make their ultrasonic noises audible and visible.

An experiment in a laboratory begins with a bat flying in circles and apparently without sound. Only occasionally a slight whirring seems to be audible when a bat approaches an object or makes a sharp turn.

But once the switch of the sound-recorder is turned; the listeners feel as though their ears had been opened. They hear continuous rhythmical successions of strange sounds, now suddenly swelling, now slowly fading. It is hard to believe that this noise, which sometimes sounds like bursts of fire from a machine-gun and sometimes like the chugging of a diesel engine, comes from the bat.



**OUT!**

ON SEPTEMBER 1st

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Hi-Fi Magazine

**YEAR BOOK**



- Specifications of tape recorders
- Lists of makers of machines and hi-fi equipment
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- Glossary of tape and audio terms
- Chart of playing times
- Frequency range chart
- Advice on choosing and using a recorder
- Articles on copyright, hi-fi, cine, etc.



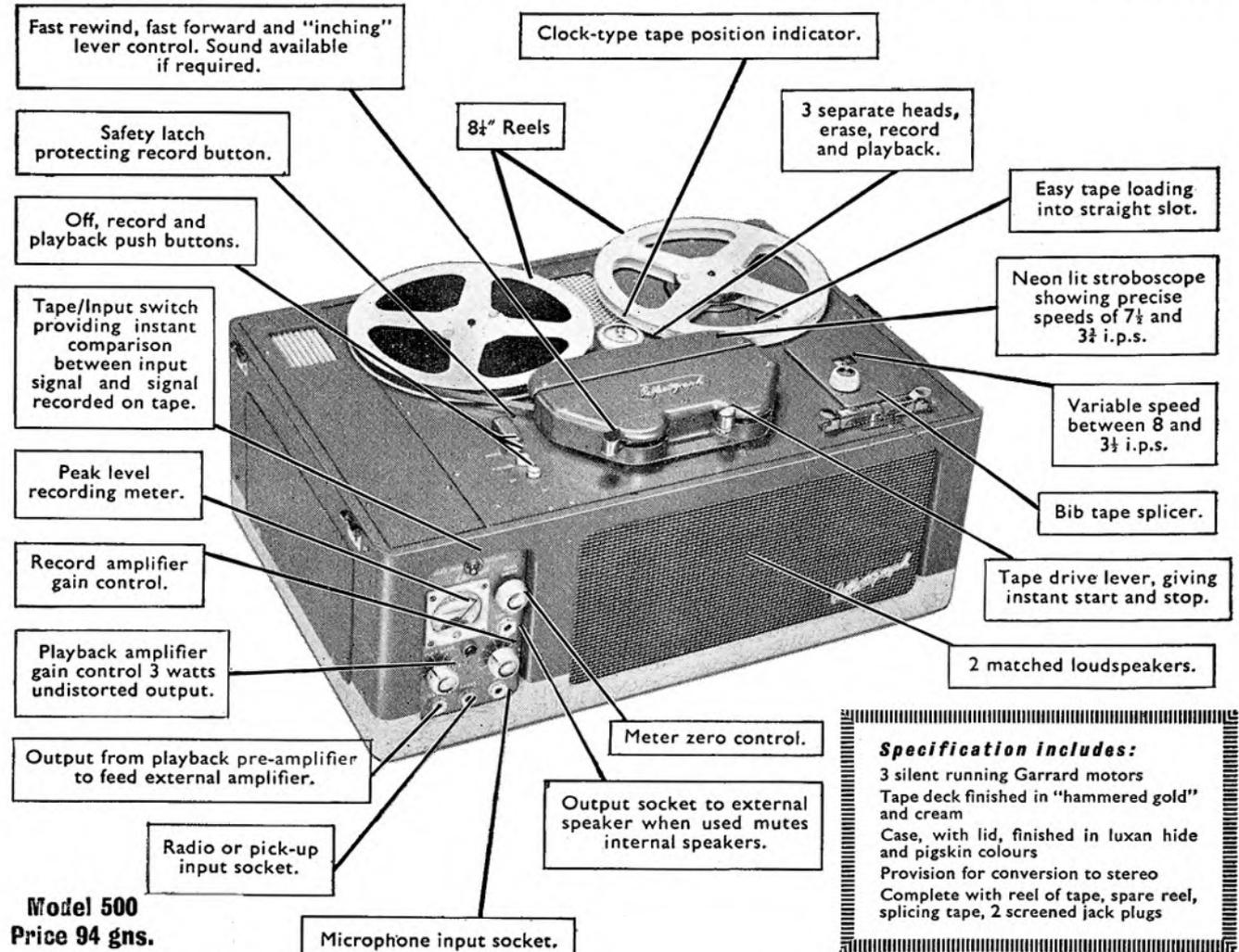
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# Reflectograph

## PROFESSIONAL RECORDERS FOR THE HOME



### Specification includes:

3 silent running Garrard motors  
Tape deck finished in "hammered gold" and cream  
Case, with lid, finished in luxan hide and pigskin colours  
Provision for conversion to stereo  
Complete with reel of tape, spare reel, splicing tape, 2 screened jack plugs

### THE TECHNICAL EXPERTS' OPINION OF THE REFLECTOGRAPH:

P. Wilson, M.A.  
"The Gramophone"

This is without doubt the most versatile domestic tape recorder that I have had the pleasure of trying out, and the quality, both of its recording and its playback, is of exceptionally high standard. For quality of performance, then, I give the instrument full marks: I know of no better. For the construction I have nothing but praise. There is nothing flimsy about it either as a piece of mechanism or on the electronic side. It is a fine piece of engineering up to the highest British standards.

*If unable to visit the Show, write for descriptive folder and interesting article on editing tape recordings. Please state name of local high fidelity retailer.*

D. W. Aldous,  
M.Inst.E., M.B.K.S.  
"The Gramophone  
Record Review"

The separate record and replay amplifiers make possible the direct monitoring from the tape during the actual recording and this facility is certainly a boon. There is no doubt whatever that when one has used this type of recorder one never wishes to return to the combined record/playback type of instrument. I have never heard better quality at 7 1/2 in.p.s. from any tape recorder that has passed through

my hands. The "Reflectograph" is a pedigree tape recorder of immaculate construction and impeccable performance.

James Moir, "Hi-Fi News"

Separate motors are used for capstan drive and both spools, all three motors being of Garrard manufacture. The overall impression after some months of use is that the machine is convenient and pleasant to handle, while the extra facilities make it very suitable for professional use.

REFLECTOGRAPH DIVISION, MULTIMUSIC LTD., MAYLANDS AVENUE, HEMEL HEMPSTEAD, HERTS.

REFLECTOGRAPH WILL BE EXHIBITED

IN THE MAIN HALL AT

**THE RADIO SHOW**  
**EARLS COURT**  
**AUG. 27 — SEPT. 6**

AND DEMONSTRATED\* IN  
THE AUDIO HALL

\* ADMISSION BY TICKET ONLY

# CONTEST

reaches its

# CLIMAX

**T**HE Second British Amateur Tape Recording Contest reaches its climax at Earls Court Radio Show on Saturday, August 30th at 7.30 p.m. We look forward to meeting many of our readers there and at our Stand 405 in the Audio Hall.

As we go to press judges Jo Douglas, Tony Gibson, Douglas Gardner and Charles Mason are hard at work listening to and appraising the many tapes received.

Notifications will be sent to the winners in good time to allow them to enjoy the exciting programme (announced in last month's issue) for Saturday, August 30th.



There is only one alteration to this programme. The reception by Lustraphone Ltd. for members of the recording industry to meet the winners has unfortunately had to be cancelled.

Additions to the prize list include Bib Splicers (presented by Multimusic Ltd.) and a year's subscription to *Tape Recording Hi-Fi Magazine* (by Lustraphone Ltd.) for all winners. An additional prize is an Acos 39 microphone (from Cosmocord Ltd.).

We ourselves are presenting certificates to all the winners and donating the *Tape Recording Magazine International Shield* for the best individual entry in the International Contest to be held in Berne in October.

Write now, enclosing a stamped, addressed envelope for your free Contest tickets. Admission must be obtained separately at the doors to the Radio Show. On this Saturday tickets are 3s. 6d. for adults and 1s. 6d. for children. There will still be time for a visit to the Show after the Contest ends.

Nancy Spain will be there to present the prizes, Tony Gibson to give the commentary, and we are hoping that other entertainment stars will join us. We know that you will wish to be there as well.

See us at

**THE RADIO  
SHOW**

EARLS COURT  
AUG 27 - SEPT 6



(Stand 405 in the Audio Hall)

Make your visit to the  
**RADIO SHOW**

a visit to the

**British Amateur Tape  
Recording Contest**

**Saturday, August 30th  
at 7.30 p.m.**

**The South Restaurant  
Earls Court, London**

**Tickets obtainable from "T.R. Magazine"**

# Authors on the track of style

**W**E have often heard about actors and radio and television stars who use a tape recorder to help them to discover just how good, or bad, they are; but it seems to me that there is something especially significant about the fact—which came to my notice the other day—that John Steinbeck uses a recorder to play over the material he writes.

His chief purpose, I believe, is to assure himself that his characters ring true, but the idea is a good one from every point of view, and as an addict of thoroughly good writing I should be happy to hear that authors of every brow and hue were taking to tape as a check on the quality of their prose.

For the fact is that, in spite of its apparently visual channel of communication, the written word is still fundamentally a thing of sound. All the great writers down the ages have been acutely aware of this—take any paragraph of Stevenson, for example—and it must be broadly true to say that if you find yourself tripping up frequently over recording a piece of prose (with phrases like “mixed change”), then the author is neither a present nor a prospective resident of the hall of fame.

And how pleasant to reflect that a modern electronic marvel like the tape recorder can put us closer in touch than ever before with one of the inner secrets of the ancient art of writing.

## No Distortion

**A** FRIEND who has been a language teacher for many years and who has never stopped learning languages himself—including the phonetically difficult ones of the Middle East—points out to me how a tape recorder can do more for the linguist than even the finest teacher.

The fatal fault he has found in most human instructors is that they cannot repeat words and phrases, to demonstrate points of pronunciation, without slightly distorting the original sound. Inevitably a trace of exaggerated emphasis accompanies the attempt to pin-point the problem under consideration.

The remedy, according to my friend, is to use as examples of the sounds one wishes to teach, words and phrases picked out of a normal, recorded flow of speech. The selected sound can be played back hundreds of times if necessary without any danger of the appearance of undesirable stress.

## Tapesponding Writers

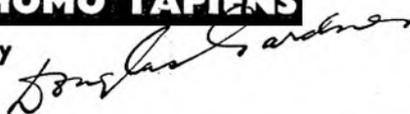
**M**R. CHARLES AITKEN, of Dundee, tells me about an interesting new Writers Club which uses tape as an aid to progress and successful marketing. A member's story is recorded, and plenty of unused tape is left on the spool for others to add their criticisms and comments and suggestions regarding suitable markets. The present route of these tapes is by way of two American members, then on to Scotland, England, South

Africa and Israel and back to U.S.A. New members are joining each month in various parts of the world. My guess is that this idea will develop into something quite large before long.

And here is another story tape idea—a Tall Story Club, started by Mr. Lee Lacy, of Luton. Lee tells me that it has

## HOMO TAPIENS

by



a membership of Mr. and Mrs. Copinger, of Southall, Mr. John Hughes, of Fulham, and himself.

Lee records a “tall” story, and passes it on to John, who records his own on track two; the Copinger's erase Lee's story, add their own and return the tape to him. Each member indicates whether he thinks the stories by the other two are true or false.

This seems to be an improvement on the current system of correspondence between heads of state.

## Music Plus Tape

**M**ORE and more music societies are taking to tape or developing their existing recording activities. At the Audio Fair I had a chat with Mr. Glyn Thomas and Mr. K. A. Key, Chairman and Technical Adviser respectively of the British Nylon Spinners Music Appreciation and Gramophone Society, of Pontypool, and Mr. Thomas has since sent me some details of the activities of this large and very well-organised society.

Their equipment includes a Spectone tape recorder, a Leak TL10 amplifier and pre-amplifier, Simon Cadenza microphone and two TSL Lorenz loudspeakers in RJ enclosure. They are now preparing to deal with the increasing use of stereophonic tapes and discs.

The society has visits from notable artists, orchestras and operatic companies and they have been able to make many recordings of a high technical and artistic standard for play-back at later meetings.

This is an example of tape usage which many similar societies might well follow. Alternatively, it suggests an opportunity for tape clubs and individual enthusiasts to collaborate for mutual enjoyment.

## Feature Enthusiast

**A** TAPE enthusiast of long standing, Mr. John Rippington, of Jarrow, has sent an interesting account of his varied activities, the chief of which consists of making up programmes which he presents to clubs (over 60 of them), Old Age Pensioners Associations, Church Guilds and other organisations. He

makes no charge, but accepts a donation towards the running costs when those concerned wish to contribute.

Mr. Rippington is very well equipped for his hobby. He owns two Ferrographs, a battery-operated Boosey and Hawkes portable for outside work, and a twin-turntable gramophone with separate volume controls and a home-made mixer. Although he has a good library of sound effects on discs he much prefers to utilise his own extensive sound recordings.

Mr. Rippington does not run a car but he covers a wide area just the same. He transports his outside equipment in a small, home-made two-wheeled trailer hitched on to the back of a bicycle.

Another asset is that he and his wife are both musical—in fact he is secretary to the Jarrow Amateur Operatic Society—and they can create their own musical effects when necessary.

Formation of Jarrow Tape Recording Club is one of Mr. Rippington's current interests, and anyone interested should get in touch with him at 30, Breamish Street, Jarrow, Co. Durham.

## Our Cover

**C**ONGRATULATIONS are coming in steadily on our new cover design, and it is only fair to give credit to the man who devised it—Ernest Jones, a Hampstead free-lance artist. Mr. Jones is a person for whom the especially difficult problem has a fatal attraction, and he brooded over our request for weeks before producing the theme on tape that you now see. He is enthusiastic about tape generally, and about this magazine, and he is always ready to join in when there is any recording being done.

One of our readers has suggested to us that tape *should not curl and twist* as it is depicted in the new cover design. Here is the age-old clash between the mind of the scientist and the eye of the artist. Of course, your tape shouldn't curl in use on your recorder. But our cover does not purport to show tape *in use*. It is a pictorial design using tape in a symbolic way.

## Studio Study

**A** LIMITED number of fortunate people will be able to see well and truly behind the professional recording scenes when the International Broadcasting Company of Portland Place, London W.1, hold their Second Annual Studio Exhibition on September 26, 27 and 28. The studios will be in an operational state and technicians will be on hand to discuss recording problems. Mr. Allen Stagg, I.B.C. Recording Manager, has promised me a few tickets for *Tape Hi-Fi Magazine* readers and I will pass them on to people who reply with alacrity (and who send a stamped addressed envelope).



**Now! Veritone give sound a new shape...**

# with the new Veritone

Tape recording takes a tremendous step forward with the new Veritone Venus. This magnificent new Veritone cabinet contains an instrument that is technically superb . . . that accepts sound, any sound, from the whisper of the wind to the full sweep of an orchestra, and reproduces it with astonishing fidelity . . . with new depth, new breadth, new and startling truth.

*The Venus gives you sound so real you can almost touch it.*

Now and in the future you will judge tape recorders by an entirely new and higher set of standards. By Veritone standards.

This, indeed, is the new shape for sound.

## LOOK! NEW THROUGH AND THROUGH

### NEW CABINET

The new Veritone cabinet is an acoustically designed box finished in rich sapele mahogany with silk front-piece and gilt fittings. It looks as good as the sound it produces.

### NEW AMPLIFIERS

Separate record and playback amplifiers give a frequency range of 40 c/s to 12 KCS. There are facilities for superimposing, echo effects and playback while recording.

### NEW DECK

You can now re-record over an existing sound track *actually hearing the first track as you record the second*—and add many layers of sound with no loss of clarity.

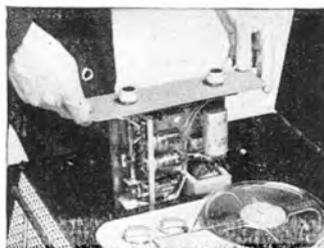
### NEW SPEAKERS

The two new speakers, 10"×6" elliptical and 4" round, the twin amplifiers and the acoustical box combine to give completely new and higher standards of sound reproduction.



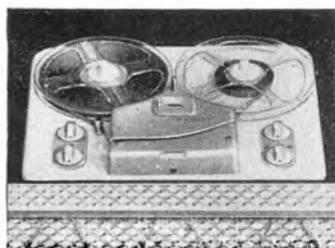
#### Beautifully Simple

Technically superb as it is, the new Venus has beautifully simple lines and controls. Plus the built-in reliability that has always been associated with the name Veritone.



#### Radio and Hi-Fi Amplifier

Two pockets in the tape deck take the specially designed V.F.M. radio (16 gns.) and the new V.Hi-Fi amplifier (20 gns.). Alternatively they offer space for extra tape reels.



#### Completely New Deck

The tape deck is brilliantly new, with two speeds, three heads (one erase, one record, one playback), counter, solenoid braking and safety interlocked controls.

Write now for free illustrated leaflet with full details. Or see and hear the new Venus at your local stockist. Then judge for yourself. Nothing else compares with it at anything like the price.

**RADIO SHOW**  
**VISIT VERITONE**  
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**ON THE GROUND FLOOR**

**VERITONE VENUS — the new shape for sound**



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# VENUS

the most beautiful  
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This is more than the most beautiful tape recorder made. It is also far and away the finest value.

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**GENERAL  
PURPOSE**

**LONG  
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TYPE NO.	TITLE	SIZE	LENGTH APPROX	Price in EMICASE	Price without EMICASE
88/3	"Message"	3" dia.	175'	—	7 6
99/3		3" dia.	250'	—	9 6
88/3N		3½" dia.	175'	—	7 6
99/3N		3½" dia.	250'	—	9 6
88/6	"Junior"	5" dia.	600'	£1 3 6	£1 1 0
99/9		5" dia.	850'	£1 10 6	£1 8 0
88/9		5½" dia.	850'	£1 10 6	£1 8 0
99/12	"Continental"	5½" dia.	1200'	£1 17 6	£1 15 0
88/12		7" dia.	1200'	£1 17 6	£1 15 0
99/18	"Standard"	7" dia.	1800'	£2 12 6	£2 10 0
88/18		8½" dia.	1750'	—	£2 17 6
99/24	"Professional"	8½" dia.	2400'	—	£3 12 6

# EMITAPE

The amazing fidelity in sound you enjoy today from microgroove records is achieved only by the use of the finest magnetic tape in the making of the "masters".

"Masters" are made on the world-famous EMITAPE — the same EMITAPE, in fact, that you can buy and use for your *own* recordings.

Because of its consistency — reel to reel, batch to batch and year to year, and its outstanding technical superiority — EMITAPE is used by the leading recording companies — by famous broadcasting authorities, such as the BBC and ITV — by industry and research. EMITAPE is your guarantee of a magnetic tape that measures up to the most exacting professional standards. Remember, E.M.I. is the only recording organisation that makes, *uses* and sells its own recording tape — EMITAPE.

**SEE US AT THE RADIO SHOW  
STAND 48**



**E.M.I. SALES & SERVICE LTD  
HAYES • MIDDLESEX • ENGLAND**

# HOW TO MAKE A BULK ERASER

ONE of the most useful accessories to a tape recording enthusiast is a bulk eraser or de-magnetiser. It is a tedious process to run a whole reel of tape through a recorder; and even if a new recording is being made, so wiping out the earlier sounds, it may not occupy as much of the tape. In that case, the residue can be confusing or even embarrassing on playback.

The safest and most convenient thing is completely to erase the whole reel.

Many readers may feel they cannot afford to buy a commercial eraser. This article will help them to construct one at home. Much of the necessary material may be found in the usual amateur's "junk box" and, in that case, the cost will be only a few shillings.

I found some discarded large mains transformers with the necessary laminations and suitable wire for rewinding. The laminations (see photograph A) measured  $5\frac{1}{4}$  by  $4\frac{1}{4}$  ins., with a centre limb  $3\frac{1}{4}$  by  $1\frac{1}{4}$  ins. Enamelled insulating wire is suitable in the hands of an experienced engineer, but it is advisable that those not so qualified should use double cotton covered wire.

Construction is well within the powers of most radio enthusiasts, with just ordinary care. But when the appara-

tus is completed, it should be taken to a qualified electrician before connecting to the mains, so that he can make a "megger" test for "infinity" insulation between the coil and the core. He should also be asked to test with an A.C. ammeter to see that the current consumption is not above three amps. If it is, more turns of wire are needed.

Sufficient laminations are required to make up a depth of at least one inch. About  $1\frac{1}{2}$  lb. of cotton covered copper wire will be needed, of S.W.G. 26 gauge. Both can be purchased, if not available.

A cardboard bobbin of the kind shown in the photographs must now be made, and the core of this bobbin is used as a "former." First wind two or three layers of thin "empire cloth" around it. Thread one end of the wire through a small hole made in the "cheek" of the bobbin, slipping it through from the inside.

About 2,500 turns of wire should now be wound neatly on to the bobbin, but so as to give a fairly loose fit (see photograph B).



Make the most of your slower speeds with

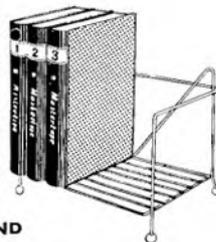
THE HIGH TOP RESPONSE OF

## Mastertape

The superb quality of MASTERTAPE ensures a high and extended top response! High top response means that Mastertape can record efficiently at lower speeds with maximum possible brilliance. In fact more for your money with Mastertape, for both quality and longer playing time.

Praised by leading experts and connoisseurs of good recording.

Attractive, ideal tape storage. Stoutly bound book containers in red, black and gold, with transfer numerals, holding two 7" reels of tape. Price 7/6d. Book rack to hold 6 books - 17/6d. Set of 6 books and rack 62/6d.



## Mastertape

MAGNETIC RECORDING TAPE BY  
MSS RECORDING CO. LTD., COLNBROOK, BUCKS., ENGLAND  
Telephone: Colnbrook 2431 (8 lines)  
SHOWROOM & STUDIO: 21 Bloomsbury Street, LONDON, W.C.1. Telephone: MUSEum 1600

## Cecil H. L. Andrew describes the construction of a simple accessory of great value

When completed, the coil should be well dried in an oven, soaked in insulating varnish to protect from damp, and then given an outer covering of insulating tape. "Systoflex" sleeving should be slipped over the two loose wire ends (see photograph C).

The details given above are intended for a core size of two inches cross-section, requiring about four turns per volt. For those who wish to use a different size of core, the following equation should be employed:—

$$T \text{ (turns)} = \frac{E \text{ volts} \times 100,000,000}{N \text{ (flux lines)} \times 4.44 \times f \text{ (frequency)}}$$

Thus, for a 50-cycle supply, we can write:—

$$T = \frac{1 \times 100,000,000}{55,000 \times 4.44 \times 50}$$

This is for a closed iron-core circuit. But, for our purposes, the yolk is omitted, in order to get the magnetising current, and consequently about 20 per cent more turns should be added to the usual tables for closed cores.

An open core circuit tends to overheat a little if in continuous use, but this need not worry us, since we shall be using the apparatus for only brief periods.

If desired, a small red pilot lamp can be incorporated, as a warning signal that the eraser is switched on. The turns required for a miniature lamp of four to six volts can be calculated from the formula above; this should be a completely independent coil, well insulated from the main coil.

All the calculations above are for a "unit" core section; that is, a centre core of one square inch sectional area. If the core section is increased, the total "flux" is increased, and the turns per volt should accordingly be reduced.

For example, a core section of one square inch requires eight turns per volt, for 50 cycle mains; but a core section of two square inches needs only four turns per volt, while one of 0.5 square inches needs 16 turns per volt.

The eraser needs to be fitted in a simple case of wood or plastic, with a top cover of thin paxolin sheet.

A spindle is incorporated, placed over the centre of one of the outside, smaller limbs of the core.

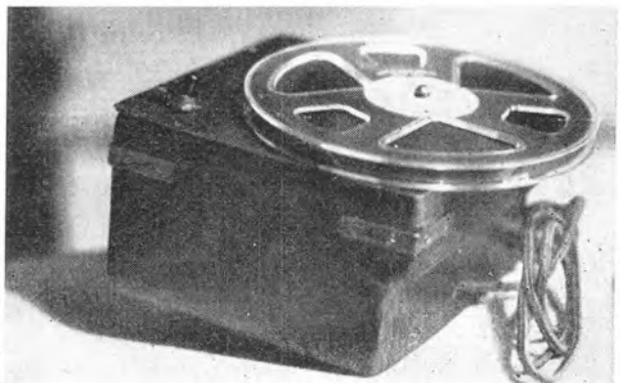
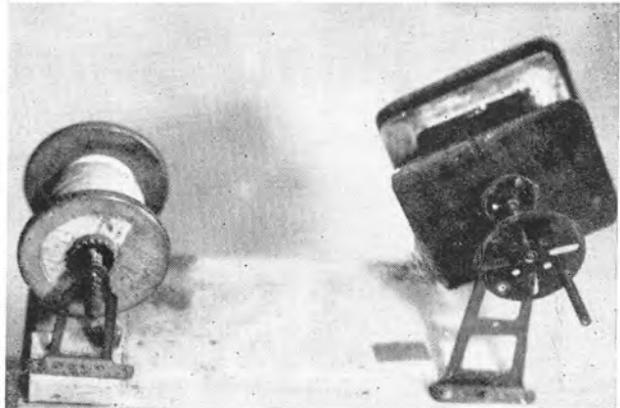
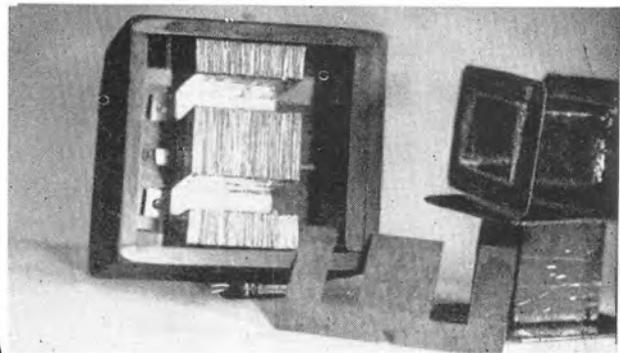
When connected to the mains and switched on, the reel of tape should be lowered over the spindle and given two or three slow turns. Then reverse the reel and repeat this exercise. The tape should then be clear of all recording or background noise.

The eraser can also be used to de-magnetise or depolarise sound-heads or other parts of a recorder which may be accidentally magnetised.

But it is inadvisable to bring a watch near it when it is switched on, as it may be affected.

Erasers I have made on the above lines have been in use for a long time and have given no trouble whatever. This apparatus is well worth the little trouble involved in the making.

(Photograph D shows the eraser when completed)



**10** points prove



**BASF is the leading Magnetic Recording Tape!**



- 1** Extra-smooth recording surface
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*The original . . . and still the Best*

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# TAPE RECORDING GOES TO LAW

"Is this your signature?"

"Yes, but the statement above it is not my confession and the police are liars if they say it was read over to me before they asked me to sign it."

The familiar exchange takes a different form in the civil courts.

"Are you saying that this conversation never took place?"

"Certainly, I have never spoken to the plaintiff in my life."

The lie direct; and it is not always easy for the cross-examiner to expose it. Lawyers are, therefore, examining with interest the introduction of tape recordings of voices as permissible evidence in the English courts, and are speculating on the scope that may lie before this new development.

The first reported case of the admission of a modern tape recording as evidence in our courts was probably that heard in November, 1954, at the Southwark County Court, in London. At the hearing of this civil claim, a recording of a conversation between the parties was admitted as evidence. The plaintiff denied, in reply to counsel, that he had in any way tampered with the recording.

When the case was resumed some days later, a tape recording engineer was called to the witness box and he said he could recognise that parts of the conversation had been erased and re-recorded. The background noises were different in various sections of the recordings and the microphone had been placed at varying distances from the recording machine. The plaintiff then confessed that he had altered the recording. He had played it through to his wife and she had been so disgusted with some of his bad language that, when she had gone to bed, he had erased and re-recorded to omit the swear words! The learned judge said that he might well go to prison for his perjury.

This judge's decision to admit tape recorded evidence may have been influenced by the fact that, a little earlier that year, the Divorce Court had tacitly approved tape recordings. A husband had appealed against a decree granted to his wife, saying that she had condoned his, admitted, matrimonial offence. When he alleged that a tape recording contained the voices of his wife and her sister in a conversation which proved this, the judges ordered the equipment to be examined by the Queen's Proctor and expressed the hope that, in spite of accidental erasures by a small boy, engineers could decipher the voices.

These cases seem to mark the introduction of tape recordings to our civil courts, but as early as 1927 a Dictaphone record was permitted to be used as an aid to memory. A witness had said that, immediately after a dis-



By

ANDREW  
PHELAN



puted interview, he had dictated into a Dictaphone his recollection of what had taken place. The High Court judge at once raised the question whether a Dictaphone record had ever

been accepted in evidence by the courts and, upon counsel replying that he did not think so, said that he saw no reason why such a record as the witness referred to should not be put forward as evidence.

More recently, in December, 1957, estate agents sued in a London court for commission they said they had earned by introducing a purchaser to their client. They had made a simultaneous recording of a telephone conversation with the prospective customer. A transcript of this recording was referred to in the cross-examination of this witness, but was not actually put in evidence. Had there been such an application, there seems little doubt now that the tape recording itself could properly have been put before the court.

The position in criminal cases seems to be similar. In a case reported in 1956, Mr. Justice Hilbery, having heard legal argument, ruled that the court and jury should hear a tape recording of a disputed conversation which took place in Salisbury police station, and that the jury should then be supplied with a transcript. The learned judge, with legal conservatism, doubted the necessity of a tape recording, but had no doubts as to its admissibility. "We have always got on very well without this device, but now it has been produced and it may be admitted," he said.

There have been suggestions in recent years in the House of Commons that tape should be used to record interviews

*(Continued on page 59)*



# Methods of erasure

**THE ERASE HEAD.** This is similar to the record/playback head, but the gap is much wider for reasons to be explained later. The coil of the erase head is connected to the H.F. oscillator, and a large alternating current of up to half an amp. at a frequency between 50 and 100 kc/s is passed through the coil. This current produces a very strong magnetic field in the gap, much stronger than the field in the recording head. Any portion of the tape passing across the erase head gap becomes so strongly magnetised by this high frequency field that the tape becomes saturated magnetically on the peak of the current. Any recording on the tape is completely obliterated.

As the portion of the tape moves out of the gap, it continues to be alternately magnetised by the H.F. magnetic field. The field, however, is very weak at even a short distance from the gap, and dies out altogether about half an inch away, and so the magnetism in the tape will get weaker and weaker until it dies out altogether, leaving the tape unmagnetised ready to pass across the recording head for re-use.

The success of this method depends upon the following: (a) The H.F. field in the gap should be strong enough to saturate the tape; (b) The field (and therefore the current)

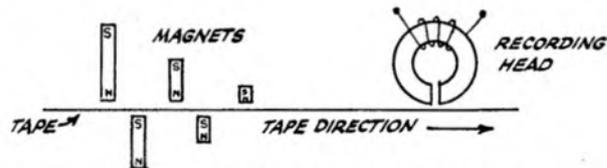


FIG 1. ERASING BY PERMANENT MAGNETS

should be sinusoidal to reduce noise and distortion to a minimum; and (c) the field should perform several complete cycles or alternations during the time any portion of the tape is actually in the gap. For this reason the gap is wider than that of the record/playback head.

**ERASING BY PERMANENT MAGNETS.** Permanent magnets may be used in place of the erase head, although the H.F. oscillator would still be required to provide bias for the recording head.

In the simplest case, merely allowing the tape to rub against the pole of a permanent magnet will have an erasing effect and complete erasure can be accomplished if the magnet is sufficiently powerful. In practice, the magnet is coupled mechanically to the change-over switch, so that when switched to "record" the magnet is brought into position normally occupied by the erase head. During playback, the magnet is swung well away from the tape. Incidentally, this paragraph should also act as a warning for all users to keep their tapes well away from any strong magnetic field, as otherwise a valuable recording may easily be partly erased.

A disadvantage with this method is that, although the record signal is removed, the tape is left permanently magnetised, and this may lead to the next recording having a rather high background noise when played back. A more complicated arrangement to overcome this is shown in fig. 1, where it is seen that several magnets of diminishing strengths are used, placed so that adjacent magnets have opposite poles in contact with the tape. Thus, a portion of the tape entering this assembly of magnets is alternately magnetised to a lesser and lesser degree, until it emerges completely erased and almost completely unmagnetised.

**H.F. OSCILLATOR.** An oscillator is an electronic circuit which converts the H.T. supplied to it into alternating current. It is, in fact, a tiny version of the generators used in a power station, but, whereas the power station alternator produces millions of watts, the oscillator only supplies a few watts, or even fractions of a watt.

The oscillator possesses no moving parts, and this is a great advantage. In addition, it is easy to design an oscillator to supply A.C. at almost any frequency from a few cycles per second up to many megacycles per second.

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Sept/68

IC137

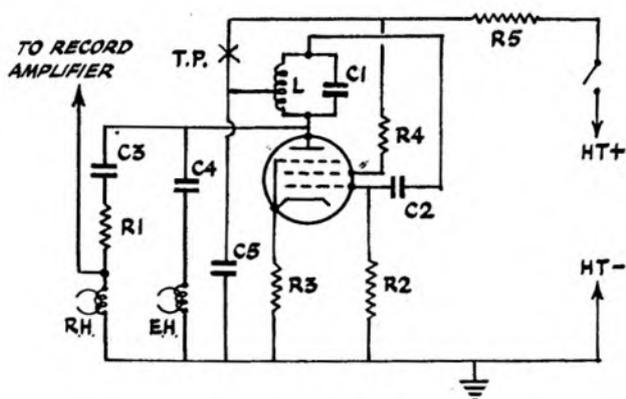


FIG 2. HARTLEY OSCILLATOR

What is more, the frequency is easily controllable over wide ranges. An oscillator usually contains one valve, and several other components, although more than one valve may sometimes be employed.

The H.F. oscillator in a tape recorder is necessary for two purposes: First, to supply High Frequency bias current to the recording head and, second, to supply a much greater H.F. current to the erase head. The frequency required must be higher than any to which the ear will respond, so as not to be audible in the background of the recording; normally it lies between 50 kc/s and 100 kc/s. This frequency is not critical. The output should have a sine waveform (which is another way of saying it should possess no harmonics) otherwise noise and distortion may result.

The power required for bias to the recording head is small, the H.F. current being of the order 1 mA. On the other hand, the erase head demands a comparatively large power, and H.F. currents of between 200 and 500 mA may be met. The valve used is normally an output pentode or tetrode, so as to provide sufficient power. In fact, the output valve in the playback amplifier usually plays a dual role, being used as the H.F. oscillator valve when switched to record.



Figure 2 shows the circuit of a typical H.F. oscillator, known as the Hartley oscillator. The frequency of oscillation depends upon the tapped coil L and the capacitor  $C_1$ . To increase the frequency, decrease  $C_1$ , and vice versa. The component values are very approximate, but give a starting point for the experimenter. To test for oscillation, break the lead from the coil tap at the place marked X and insert a milliammeter in series with this lead, so as to measure the anode current of the valve. Switch on, and note the reading. Next, using a screwdriver with an insulated handle, short out  $C_1$ . If the anode current now rises an appreciable amount, it proves that the circuit was previously oscillating. Remove the short circuit, and the anode current should fall to its original value, showing that the circuit is again oscillating.

It must be stressed at this stage that the greatest care must be taken when attempting any tests or adjustments on electrical apparatus of any kind. A well-made tape recorder is completely safe to handle, as long as the manu-

CHARLES LANGTON, A.M.Brit.i.R.E.  
in the fourth article in his series,  
continues his survey of the  
component parts of a recorder

facturer's instructions are adhered to. Once the cabinet has been removed, however, there is the great danger of receiving an electric shock, and enthusiasts who are inexperienced in electrical matters are strongly advised to leave all the internal adjustments to the expert.

Referring again to fig. 2, two outputs are taken from the anode. One output is fed to the recording head for bias, and this current is kept low by using a small coupling capacitor  $C_5$  in series with a resistance  $R_1$ . On the other hand, the erase head is fed from the anode via the larger capacitor  $C_4$ . The coil L would have to have an inductance of a few millihenrys.

An interesting point is the inclusion of  $R_3$  and  $C_3$ . When the H.T. is switched on or off, these components prevent an abrupt rise or fall in the H.T. actually applied to the valve, and this in turn allows the erase current to gradually rise to its maximum or to fall to zero. There is, therefore, less chance of noise being induced on the tape due to H.T. surges.

Another popular circuit is the Meissner oscillator, shown in fig. 3. This does not use a tapped coil, but instead two coils are wound close together on the same former.  $C_1$  is the tuning capacitor.

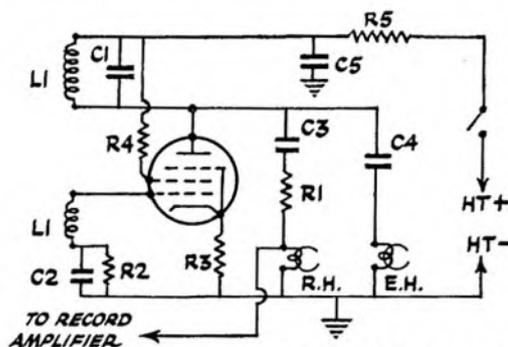
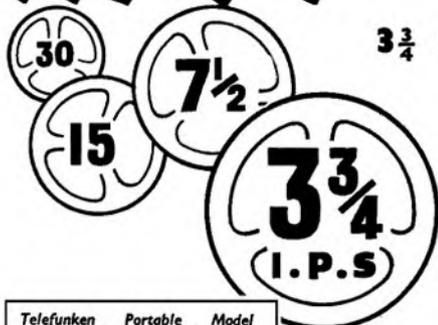


FIG 3. MEISSNER OSCILLATOR

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# MEDICINE SENT ON SPOOLS

*An absorbing account of modern medical method*

Told by **PAT FRYER**

"I WISH I could take you back with me to Paris," said Gerry Nathan, a young American student, to Dr. X in his Harley Street consulting room.

"I can arrange for you to take me back with you—on tape," suggested the doctor, a French-Canadian hypnotist so well known that patients come to him from all over the world.

Six weeks earlier Gerry had thrown up his studies in Paris and flown to London to consult Dr. X in a last desperate attempt to find a cure for the headaches which almost blinded him.

Gerry's headaches started one morning when he was playing golf with his father.

"I missed an easy shot, and he shouted at me. He was a perfectionist. I never could measure up to his standards, though I knocked myself out trying. Suddenly, I felt a fierce pain just here!" He touched a spot on the left side of his head. "Funny thing, I'd been hit on that exact spot with a baseball bat about a year previously."

He'd sought medical advice but was told the blow from the baseball bat had healed perfectly. There was no physical reason for his headaches. Yet they persisted. Any stress or excitement started a headache, and the young man feared a nervous breakdown.

There are many techniques to induce hypnosis. Some hypnotists use the "fixed gazing" method, and ask the subject to gaze at some shining object, at the same time suggesting sleep. Dr. X, however, relies on verbal suggestion alone to induce the hypnotic state. He asked Gerry to lie on the couch, and in a low, monotonous voice led him from the thought of relaxation through drowsiness to hypnotic sleep.

He proved a good hypnotic subject, and at "five" he was in the medium stage of hypnotic trance, breathing deeply, unable to open his eyes, obedient to curative suggestions. At this stage the hypnotist can make his subject re-live any past experience, pleasant or painful.

Dr. X explained to him under hypnosis that his headaches were a symptom of tension. They represented escape from the task of trying to measure up to his father's impossibly high standards.

By skilful persuasion, he reassured Gerry about his hidden fears, and bolstered his shattered self-confidence.

He awakened him saying: "When I count up to 'five' you will wake up, feeling rested and refreshed."

Six weeks and twelve hypnotic sessions later Gerry felt fine, but he dreaded the possibility that back in Paris his headaches might return.

Dr. X reassured him: "You can take me back with you," he said. "At least, you can take my voice with you—on tape." Before he awakened him from his final (Harley Street) hypnotic session, he conditioned him for future "tape-trances" by planting the suggestion in his mind that, at the first sound of his hypnotist's voice on tape, he would immediately fall into a trance.

Tape hypnotism is most likely to succeed with subjects like Gerry whom a hypnotist can easily put into a medium or deep trance. Those who can pass merely into the first, or light, stage of hypnosis in the actual presence of a hypnotist may find it hard to pass into a tape-trance in his absence. In time, they

may condition themselves to falling into a light hypnotic sleep by listening to the hypnotist's voice on tape, but this calls for mental discipline, patience and practice.

Dr. X advised Gerry to go into a room by himself and arrange for peace and quiet. "No sudden noises. No visitors. No phone ringing—disconnect the bell or take the receiver off the hook," he said. "Relaxation is a 'must' before hypnosis can be induced, and it's impossible to relax if your feet are cold, or there's a draught whistling down your neck. So see that your room is pleasantly warm. Sit comfortably in an armchair or lie down on a couch. Then, when you switch on your tape recorder, you'll feel utterly relaxed and be able to respond adequately to my voice. . . ."

These precautions against noise and disturbance are important—they lessen the risk of distraction in the early stages of trance induction.

Dr. X spoke into the microphone as though speaking directly to his patient. He repeated his suggestions and finished as usual—by telling him he would waken feeling rested and refreshed at the count of "five."

Thereafter, he had Dr. X's hypnotic treatment on tap whenever he felt the need of it—on tape.



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## MICROPHONES • PART 2

# There's a mike for every need

**T**APE recording enthusiasts have a wide variety of microphones to choose from. Last month we gave an indication of the general principles on which a selection should be based: below are details of some of the microphones that are available.

Among the wide range of microphones by Lustraphone Ltd. those most interesting to the tape recording enthusiast are the ribbon velocity models VR53 and VR/64, and the dynamic microphones LFV59, LFV/H59, LV/59, LD/61 and TH59/SB.

Model VR/53 is a broadcast studio class instrument with a substantially flat response of 40-14,000 cps and impedances of 20,500 and 50,000 ohms. It has complete blast screening.

\* \* \*

Model VR/64 is the well-known pencil ribbon microphone of small dimensions, but with the excellent response of 50-13,000 cps, and low line or high impedance. With its automatic swivel mounting permitting positioning to within



The Lustraphone VR64



The new Philips EL 6021

30° rearwards from the vertical, this model has proved its worth for tape recording work.

The "Lustrette" LD/61 is compact and elegant, with a response of 70-12,000 cps. It can be used standing, or as a hand instrument.

Model LFV/59 is a full vision microphone for stand use and LFV/H59 is a hand version. It has a response of 150-14,000 cps. The same microphone appears, with a halter neck band and spring clip, as LV/59. This permits freedom of the hands for operating a recorder while commentating. Model TH59/SB has a useful press-to-talk switch and hanging button.

\* \* \*

Philips Electrical Ltd. have recently replaced the EL6020 with a moving-coil, omni-directional microphone designated Type EL6021. Designed for high quality reproduction of speech and music, it is of rugged construction and has a frequency response of 50-10,000 cps. Impedances are 50, 500 and 10,000 ohms and

the sensitivity is 1.6mV/u bar (-56dB) at 10,000 ohms.

Microphones by Vitavox Ltd., of interest to tape recording enthusiasts include the B.50 series and Type A microphones. The former are hand models, styled for ease of operation by right and left handed people; types B.50 and B.51 are available with a comprehensive range of switching combinations, the normal operation being "Press-to-speak," with a locking action when required. The nominal frequency response is 60-8,000 cps.

Types B.50 and B.52 are fitted with dynamic inserts, and B.51 is a crystal version. The standard range of Vitavox microphone transformers is suitable for use with these models, and a simple desk stand is also available.

\* \* \*

The Vitavox "A" Type microphone, also with a frequency response of 60-8,000, has been designed to provide an even, wide-range performance rather than a high output. It is fitted with a lightweight metal diaphragm and an efficient magnet system, and has a wide range of accessories including stands, matching transformers and a suspension mounting.

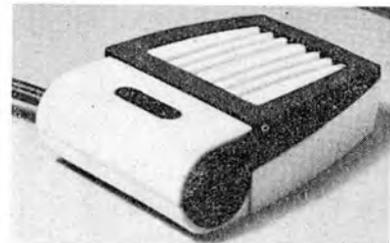
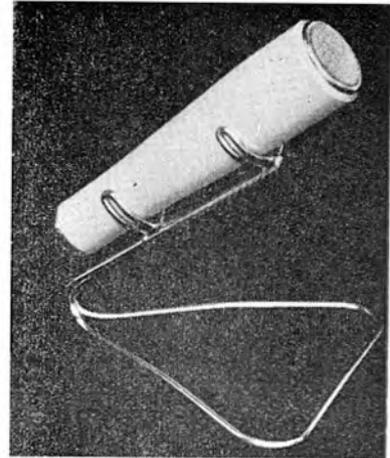
Among the many Ronette microphones supplied by Trianon Electric Ltd., the O88 series calls for special attention having been developed specifically for use with magnetic recording equipment. They have omni-directional characteristics and are obtainable with various voltage/frequency-response curves to suit different needs. Alternative fittings include a universal joint and a flexible chromium-plated tube with a universal joint at the other end.

All Ronette O88 types can be supplied with Filtercel, DX12 and ZA inserts. The filter units are designed to damp the resonance without decreasing sensitivity at the other frequencies.

Another deservedly popular instrument is the elegant Simon Sound Cadenza ribbon microphone. It has a dual impedance head and an output sensibly flat between 50-12,000 cps.



Left: The Film Industries Ribbon microphone M.9. Right: Two Cosmocord instruments—the Acos Mic 39-1 and (below) the Acos Mic 40 in its folded position



Reslosound Ltd., make a valuable contribution with their Reslo ribbon microphones, the product of 23 years of specialisation. Type R.B. is bi-directional and type C.R. is a uni-directional model.

Among the range of Acos microphones by Cosmocord Ltd., model Mic 40 is outstanding, having been specially designed for use with tape recorders. The two-position stand enables it to be used in the hand or free-standing and when the stand is folded into place it occupies a very small space.

\* \* \*

Mic 39-1 is almost equally familiar to tape enthusiasts with its slender body and neat desk stand and floor stand. It has a special noise free cable and a heavy die-cast liner eliminates hum pick-up due to hand capacity effects.

Three substantial U-magnets are incorporated in the M9 ribbon microphone by Film Industries Ltd., to provide a high field. The ribbon is of aluminium alloy

0.0001 in. thick and the mounting is of a convenient flat desk-type.

The Trix Electrical Co. Ltd. offer a number of microphones for various purposes. Model G7850 is a pencil type dynamic microphone suitable either for hand or stand use. It has a frequency response of 50-10,000 cps, and 30 ohms impedance. Model G7851 is the same but fitted with a sliding switch. A table base with flexible stem is available.

Model G7871 is a moving coil microphone with 30 ohms impedance and a frequency response of 50-8,000. The casing is in satin chrome finish and there are three types: A, with microphone head only; B, mounted on switch box unit; and C, with screened connector and locking ring.

One of the best-known Trix microphones is Model G7822, a ribbon microphone with a substantially linear response within  $\pm 2$ dB between 50 and 12,000 cps. It is a neat instrument,

weighing  $7\frac{1}{2}$  ozs., and owing to its high sensitivity is usually found to be interchangeable with moving-coil dynamic types. It is normally supplied for low impedance output (30 ohms) but it is also available (Model G7822/H) with high impedance output.

A.K.G. microphones are now available in this country through Politechna (London) Ltd. who are sole agents for Great Britain and the British Commonwealth. The omni-directional dynamic Model D9 has a frequency range of 80 to 10,000 cps; cardioid dynamic Model D11 covers 60 to 10,000 cps; and Model D19B is a cardioid dynamic microphone for high quality recordings with a frequency range of 40 to 16,000 cps and a bass cut control. There are also a number of professional models.

## Manufacturers news round-up

Tape recordists who have a turntable as part of their equipment will be interested in the "Hi-Fi Test Disk No. 1," supplied by *Gramophone Record Review*. It helps one to tune bass reflex loudspeaker enclosures, match up tweeters, etc., test amplifier equalisation, check system noise level, detect resonance points and to perform many other tests. The record also includes a recording of a late nineteenth century music-box and a sound effects quiz. The price of this record is 39s. 11½d.

\* \* \*

Four "matching" booklets have been issued recently by Rogers Developments (Electronics) Ltd., describing the RD Cadet amplifier and control unit; the RD Senior Mark II amplifier and Mark IV control unit; the RD Junior amplifier and Mark II control unit; and the RD Junior FM unit. Leaflets describe a general purpose power pack and the RD Junior corner horn.

Grundig have moved their factory and offices into new and larger premises at Sydenham, the new address being Grundig (Great Britain) Ltd., Newlands Park, Sydenham, London, S.E.26 (Sydenham 2211). The showroom and the Publicity and Advertising Department remain at 39/41, New Oxford Street, London, W.C.1.

\* \* \*

The retail price of the Verdik S.1 portable tape recorder has been increased from 42 gns. to 45 gns.

\* \* \*

The stereophonic sound system used in the Son et Lumière spectacle at Cardiff was specially designed, built and installed by E.M.I. Sales and Service Ltd.

\* \* \*

Trade distribution for C.Q. products, through leading wholesalers in London and the provinces, is being continued under the direct personal attention of Mr. Rupert Neve.



The Simon Sound Cadenza ribbon microphone

# Ronette



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RONETTE produces several other types as well.

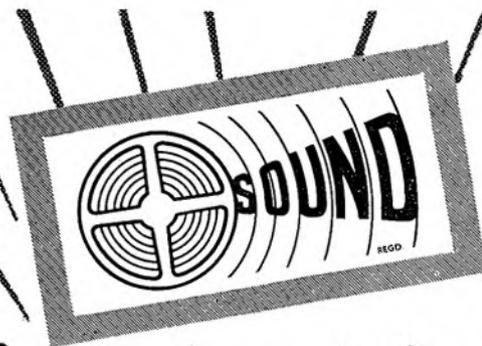
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# STEREO OR BINAURAL?



*The article in a recent issue by John Berridge has caused lively discussion among tape enthusiasts. Three of the many letters we have received are published on this page.*

JOHN BERRIDGE'S article on stereo and binaural sound (July issue) was interesting, even if his idea of pocket-sized transmitters was hardly as practical as he suggested. Personally, I see no reason why anyone should want to wander around the house while listening to stereo or binaural recording, whether wearing earphones or not.

I feel that stereo is more natural, in that source of the various sound components stay fixed, more or less, relative to the room. With binaural, wearing headphones, if you move your head, the whole orchestra or whatever it is you're listening to moves as well, and this can hardly be called natural.

But, apart from all this, the author has made several errors of fact.

CinemaScope does not have seven tracks, but four only, coated as stripes down each side of the sprocket holes on the 35 mm print. (Other types of track are also used, but this is the commonly-accepted magnetic stereo track for the majority of CinemaScope films.) Three of these tracks are confined to speakers behind the screen, limited to roughly some 60° only, out of the 360°, for the majority of the audience. The fourth track is used only occasionally for "noises off" and is played through a series of speakers surrounding the rest of the auditorium.

Neither do Cinerama and Todd-AO have nine channels. Cinerama has seven on a separate synchronised 35 mm perforated tape, and Todd-AO has six, striped on the 70 mm print in similar fashion to the CinemaScope tracks. These two more nearly approximate to a full 360° coverage than CinemaScope. Cine-Miracle, on the other hand, uses a seven channel track similar to that of Cinerama, but five of the tracks are fed to speakers behind the screen, covering about 140° for the majority of the audience, the remaining two channels being used for off-screen effects similarly to CinemaScope, and therefore does not have the same "surrounding" effect given to Cinerama and Todd-AO.

I really don't see why so many microphones or speakers need be employed to cover 360° for reasonable effect. Three placed 120° apart, each having a coverage approximately 120° (which is not difficult) should provide adequate effect for home listening. If stereo tapes are played in a large hall which is not acoustically designed to remove echoes, obviously the effect is going to be partly

destroyed. In small rooms, the echo interference is small enough to be negligible. Your short report from Brenell's, in the same issue, bears this out.

Mr. Berridge's average human being who is some nine inches between the ears must need a real outsize in hats. The average is much nearer to five and a-half inches or six inches.

DONALD JEATER.

Portsmouth.



I WONDER if Mr. Berridge has carried out the experiment of listening to the right recording channel with the left ear, and *vice versa*. If no adverse physiological effects ensue (since, in effect, the instrument positions in the orchestra would be reversed) this would appear to be the one way of checking the sound levels of each channel.

I am thinking of the analogy with 3D effect. If two cards are so viewed that they give a 3D effect (stereograms) then, if the card which should be viewed by the right eye is viewed by the left and *vice versa*, the 3D effect is reversed and objects which are near then appear to be furthest away. This can cause distress in some cases and the brain refuses to interpret the image.

OPTICIAN.

Finchley.



ARTICLES like that by Mr. Berridge are extremely valuable in helping us to assess possible lines of future development, and to check the true value of current innovations.

I feel sure that there can be an important future for reproduction through headphones, but only in special circumstances. Stereo through loudspeakers seems to be coming along very nicely and should soon be sufficiently well tamed to suit most people.

I, for one, do not insist on the nearest possible approach to the sensation of being in the actual concert hall, and the ideal, to my mind, is to have a large, well-shaped room in which to listen to stereo comfortably. Surely, if comparatively pure and uncoloured sounds can be made to emerge from the speakers the ultimate effect, with the colouration provided by my own room, should be as near to a natural sound as an imitation of somebody else's concert hall.

J. ROBINSON.

Lewisham, S.E.

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Cases made especially for—

Record Players and

Tape Recorders

Manufacturers enquiries to:—

**A. E. Puxley Ltd.**

Albron Works, King Henry's Walk,  
Balls Pond Road, London, N.1  
CLIssold 5277/7597



## THIS ISN'T MUSIC

**L**IKE Mr. Tams, I have been using my tape recorder to compile musique concrete, but find myself unable to share his opinion that it is a "musical tool."

The fact of the matter is that musique concrete is neither music nor art. These weird sounds may give technical satisfaction to the man who has strung them together, but can never convey emotion in the same way as conventional music.

To anyone who feels this is unfair criticism, I would ask them to listen to the work of Henry and Schaffer (available on two Ducretet-Thomson L.P.s). The work that must have gone into producing these pieces must have been considerable—various sounds are ingeniously distorted, played backwards and speeded up.

But the listener derives no pleasure from these eccentric compositions; the most he can do is to marvel at the technique.

DAVID HARDING.

*Cheam.*

## HEARING AIDS TO AVOID HUM

**E**VER since acquiring a tape recorder a few years ago, I have come up against the problem of how best to obtain "long range" recordings at some distance from the recorder without the introduction of "hum." The recent correspondence on the recording of weddings and birds has, once again, pinpointed this problem which besets so many tape enthusiasts, but for which manufacturers seem strangely reluctant to provide a remedy when designing their new models.

I have given much thought to this subject and, until more machines come on the market with facilities for the use of a long microphone cable when necessary, your readers may be interested in how I have been able to achieve the ultimate effect of a hum-free recording.

One method was by the fairly obvious use of two recorders. I successfully made a recording of a complete Festival of Praise by dubbing from two separate recordings made simultaneously in church. One recorder was situated in the balcony at the back of the church

*If you have a problem, write to "The Ideas Pool" about it. And if you think you have an answer to any of the queries, let other readers share your knowledge and your own experiences.*

## THE IDEAS POOL . . . .

and recorded the singing; the spoken commentary in the pulpit was picked up by the second recorder operated by a colleague at the front of the church. As only short microphone leads were used, no "hum" was experienced.

The other way was similar to that mentioned by Mr. K. L. Dean in your last issue—by the use of a small pre-amplifier. I have been experimenting with an ordinary National Health type hearing-aid in this connection and have found the results to be surprisingly effective. These instruments are easily obtained on the surplus market and, after detaching the small ear-plug provided, the required length of flex can be connected and fed into the recorder as one does when recording from the radio. No "hum" should be heard and I have yet to find a better means of recording birds at a considerable distance from the tape recorder.

S. A. SEDDON.

*Southport.*

## REV COUNTER FOR THE 700L

**I** WOULD like to suggest a solution to Mr. C. L. Collins' problem regarding a rev counter for Grundig 700L.

I don't think the Wearite clock type can be fitted easily, but the new Philips counter, Part No. EL 3979/17 can be fitted in a few moments. This was described and illustrated in T.R.M. March 58, page 33. The cost is £3 7s. 6d.

F. GARTH-LARDNER.

*Woodstock.*

## ELECTRICAL BRAKING

**I** WAS very interested in Mr. Scott-Worthington's letter on automatic spool brakes as I have experienced the same difficulty.

This suggestion is a good one, but I would like to go further and fit an electrical brake. So far, however, I have not been able to find out how to do this or where to obtain the necessary gear.

It does seem that there is quite a large call for such a modification. Can readers make any suggestions, please?

W. FAIRFAX.

*London, N.5.*

## ERASING WITH A HORSE-SHOE

**I** READ with interest the reference to a method of making a gradual erase by using a horse-shoe magnet. I tried this three years ago. How does one get rid of the "hiss" that occurs where the magnet touches the tape?

K. BLAKE.

*London, N.W.3.*

## DESIGN FOR A MIXER

**W**ITH regard to Mr. E. Jones' enquiry concerning a 3-channel mixer.

Mullard's have a design for a 4-channel mixer (two high gain two low gain channels).

Mr. Jones can easily make this into a 3-channel high gain mixer by duplicating one of the low-level input stages and feeding this into the common input to the voltage gain stage via a 470K resistor.

A. S. ASKEW.

*East Molesey.*

Next month

**HOW TO ADAPT SMALL REELS TO TAKE 50 PER CENT MORE TAPE**

*A fascinating "do-it-yourself" idea for those with simple recorders*

# See and hear them at the audio-conscious Radio Show

**T**APE recording enthusiasts who visit the Radio Show at Earls Court, which opens on August 27 and continues until September 6, will be rewarded by the first glimpse of several interesting new machines and other items of equipment, and by a number of stereo and other demonstrations showing the developments that are still going on.

In accordance with tradition, a good deal of the news of what is to be seen will not be released until the opening day. A certain amount of information has already come to hand, and details of some of the new products will be found in the following pages. Reflectograph will be showing their new Reflectograph stereophonic recorder, the first of their "Sterea-corder" instruments, which will enable recordings to be made either stereophonically or single track on two tracks, with similar facilities for reproduction.

They will have in the exhibition a stereophonic recording studio. Distinguished visitors will be invited to make stereophonic tape recordings, using two microphones, and the playback will indicate the possibility of locating the original positions of the speakers in the studio. Only a very few members of the public will be admitted: they will require tickets obtained through Reflectograph dealers.

## Deck and amp for assembly

Truvox Ltd. will be demonstrating stereo and half-track reproduction in their Demonstration Room, No. 421.

The equipment will comprise a Truvox Mk.IV tape deck fitted with stereophonic head and two Type 'K' amplifiers which will be mounted into a simple box together with a 10 in. x 6 in. loudspeaker. Truvox do not intend to produce this equipment as a complete made-up job as they wish to sell the tape deck and amplifier separately.



*This handsome cabinet has been custom-built to house the Truvox Mk IV deck, Type K stereo amplifier and a speaker for monaural playback*

They will be demonstrating stereophonic tapes which they have made themselves, and also sections of tape supplied by E.M.I., and half-track recordings made by using Truvox Radio Jaks. The equipment will be capable of reproducing stereo tapes at a frequency response of 40-15,000 cps and the half-track reproduction will cover a frequency of 50-12,000 cps. The built-in 10 in. x 6 in. 10,000-line Rola speaker will only be used for half-track reproduction, and other Rola Celestion cabinet speakers will be used for the stereo replay.

Goodmans will be demonstrating their full range of high fidelity speakers, including the new I.B.3, described elsewhere. They will also be giving a series of lectures on high fidelity and stereo to members of the trade only.

Walter Instruments Ltd. will be showing their latest models on three stands, and will be giving demonstrations of servicing tape recorders to dealers and their staffs. Another series of demonstrations, to which the public will also be admitted, will deal with cine-synchronisation. The Walter 505 and 303 de Luxe models both have cine-synchronisation facilities.

Portogram Radio and Electrical Industries Ltd. are introducing two new console tape recorders.

## Improved "Essex"

E.A.P. (Tape Recorders) Ltd. will be exhibiting the Elizabethan "Essex," its console counterpart the Elizabethan "Mayfair," and the Motek-decked Elizabethan "Escort."

The "Essex" is now an improved version, with monitoring facilities in addition to 2-channel mixing and an ultra-linear amplifier delivering 6 watts into a 15 ohms load. Also on show will be the new Elizabethan FM tuner at 16 gns. Provision has been made in the "Mayfair" for fitting this tuner. About 30 Saga-Elizabethan tape records will be demonstrated, and Elizabethan stereophonic equipment.

Lustraphone report that the emphasis of their exhibit will be centred on microphones for telecommunications, p.a. equipment and stereo and general recording, and on transistor operated equipment including p.a. equipment and mixer units.

Whiteley Electrical Radio Co., Ltd. will be showing an improved and extended range of Stentorian high fidelity products. Of particular interest are a 2½ in. loudspeaker with a rigid plastic chassis for use in portable equipment.

Brenell Engineering Co., Ltd., will be showing the Three Star and the Brenell Mark V portables, together with the Mark V deck, stereo equipment, the Brenell Tape Pre-amplifier and the mixer unit.

E.M.I. Sales and Service Ltd., will be showing their professional recording equipment, including the versatile TR90. G.E.C. will provide a stereo demonstration entitled "Stereo Scrapbook," using the 12 watt amplifier and Baby Periphonic speaker system.

Rola Celestion will also be showing some loudspeakers specially designed for stereo, as well as a notable addition to the range of speakers for amateur enthusiasts.

A number of new amplifiers and pre-amplifiers will attract attention, including the Audiomaster Tape Adaptor, by W. & N. Electronics Ltd.; a 20-watt hi-fi amplifier for the domestic market by the British Thomson-Houston Co. Ltd.; an "Astronic" Combined Stereo Unit at 23 guineas by Associated Electronic Engineers, Ltd.; a complete range of "Avantic" stereophonic amplifiers by Beam-Echo Ltd.; and three new units by C.Q. Audio Ltd.: a twin 4-watt stereo amplifier, a miniature 2-watt stereo amplifier, and a 10-watt power amplifier.

Jason will be showing among their range a new tape unit, JSM/1, price £37 10s., with separate replay amplifier for instantaneous monitoring. It is for use with decks that have facilities for using three heads. A new stereo amplifier will be shown by Pilot Radio Ltd., together with other high-fidelity equipment.

# UNDER THIRTY GUINEAS

## Two firms claim low price triumph

A NOTABLE advance in the direction of introducing tape recording to the widest possible public is the achievement by two well-known manufacturers of a tape recorder under thirty guineas. Both will be shown for the first time at the Radio Show, the Sound 333 at 26 guineas and the Walter 101 at 29 guineas. Here are the details:

### Sound 333

OFFERED as "the lowest priced complete tape recorder in the world," the Sound 333 makes its debut at the Radio Show stand of Tape Recorders (Electronics) Ltd., with a price label of 26 guineas, including Piezo electric microphone, spool of L.P. tape and extension lead for recording from radio or gramophone.

Neatly styled, with gilt fittings, the 333 measures approximately 10 x 7 x 4½ ins., and weighs 10 lbs. It has push-button controls, built-in elliptical speaker, magic eye, and facilities for use as an amplifier for public address, tuner unit or record player.

The machine takes 4¼-inch spools. It has an output of 3 watts, and the correctly compensated amplifier uses printed circuit technique. Fast forward and rewind time is given as 90 seconds.

Also to be introduced at the Radio Show is the Sound 444, using the Collaro Mark IV deck and priced at 45 guineas.

Another new Sound product is a stethoset, priced at £2 10s. It is included in the price of the Sound 555, described in the August issue of *Tape Hi-Fi Magazine*.

Tape Recorders (Electronics) Ltd., 784-788, High Road, Tottenham, N.17.

### Walter 101

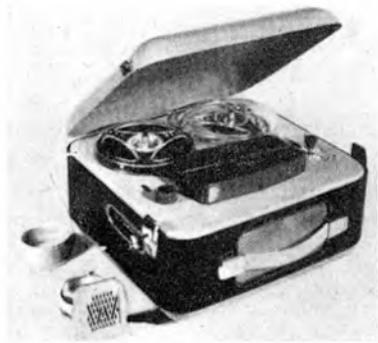
PRICED at 29 guineas, the new Walter 101 tape recorder will be one of the principal exhibits on the Walter stands at the Radio Show. It has the joystick type control common to all Walter models.

The claimed frequency response is 60-7,000 cps, the tape speed is 3½ ips, the output 2 watts and maximum spool size 5 ins. A high flux speaker is incorporated, the 101 measures 11¼ x 11 x 6½ ins., and the weight is 17 lb.

Another prominent exhibit will be the 303 de Luxe, which has the Walter Mark II deck, with speeds of 7½ and 3½ ips, and accommodation for 7-inch spools. It has a claimed frequency response of 50-12,000 cps at the higher speed, and a response of 40-16,000 cps when used as a straight-through amplifier.

The 303 has an output of 3 watts and a built-in 7 x 4 in. speaker. It has the usual joystick control, a revolution counter, and magic eye. Overall dimensions are 14 x 11 x 8½ ins., the weight is 19½ lbs., and the finish is in two-tone grey with gold piping. The price, with crystal microphone is 42 guineas. Optional extras are stethoscope-type earphones, a cine-synchronisation attachment, and a dynamic microphone.

Walter Instruments Ltd., Garth Road, Morden, Surrey.



The two under thirties. Top: the Walter 101, with joystick control, at 29 guineas, and below: the Sound 333, which Tape Recorders (Electronics) Ltd. are introducing, at 26 guineas, as "the lowest-priced complete tape recorder in the world"

## TELEFUNKEN MODIFICATIONS

AN improved frequency response of 60-13,000 cps ±3dB, at a tape speed of 3½ ips, is claimed for the latest version of the Telefunken KL65. At the other speed, 1½ ips, the response claimed is 60-8,000 cps.

This high performance, Telefunken indicate, is due to the incorporation of high efficiency Ultra heads,

The complete portable model is now designated KL65KX, and the table model, consisting of the tape deck and associated equipment, is designated KL65TX. The latter can be converted into the complete portable by purchasing the case and loudspeaker, etc., separately.

Several other improvements have been carried out with the new version, including a modification of the deck to facilitate its use with cine equipment. Another feature of the KL65 is the Telefunken

Sens-o-matic designed to prevent undue stress and tension on the tape during all operations.

The price of the complete model is 57 guineas, and that of the KL65TX 45 guineas. The machine is handled in this country by Welmec Corporation Ltd., 147, Strand, London, W.C.2.

## NEW SALES MANAGER

Mr. Roy Russell has joined the Wyndors Recording Company as Sales Manager. Outside of his tape recorder activities, Mr. Russell is the author of three published plays and a regular feature contributor to national magazines. Another play "Thanksgiving Day" was produced on B.B.C. Television and a comedy called "Return to Bedlam" was produced in London at the Garrick Theatre.

## NEW 6-WATT RECORDER WITH HARTING DECK

THE Harting deck, with speeds of 7½ and 3½ ips, is used on a new tape recorder, Model HTR/6, by Clarke and Smith. It has a six watt push-pull amplifier and a high flux 10 x 6 in. speaker of 15 ohms impedance. The claimed frequency response is 50-14,000 cps at the higher speed.

A socket is provided for feeding a large extension speaker, switched to 15 ohms low impedance or 70V medium impedance, the internal speaker being automatically disconnected when the separate speaker is in use.

There are separate bass and treble controls for playback, a fluorescent band level indicator, and an output for connection to an external amplifier, or for monitoring with high impedance headphones.

The HTR/6 measures 9½ x 18 x 15½ ins. and weighs 36 lbs. The price, including crystal stick microphone is 75 guineas.

Clarke & Smith Manufacturing Co., Ltd., Melbourn Works, Wallington, Surrey.



# OPTIONAL CONSOLETTA

**Screw-in legs make the difference  
with the latest Elpico model**

**A** TAPE recorder that can be used as a portable or, by the insertion of four contemporary-design legs, as a free-standing consolette, has been introduced by Lee Products (Great Britain) Ltd. Known as the Elpico TR/350, it uses the Collaro Mark IV deck, and has a concealed 8 x 5 in. speaker. The fittings for the legs are revealed by removing the normal plastic standing pads.

Priced at 65 guineas, the TR/350 has built-in mixing with independent mic and gram controls, wide angle record level

indicator, and separate playback volume control. The latter facility ensures that when the controls are set for recording they need not be altered for playing back.

The cabinet, measuring 16 x 17 x 9 ins., is in green and coral with gilt trim and padded top. A pocket is provided for spare tapes and the case has twin locks. The weight is 35 lbs. The price includes the legs, a crystal microphone fitted with screened jack plug and an L.P. tape.

*Lee Products (Gt. Britain) Ltd., Elpico House, Longford Street, London, N.W.1.*

## These speakers save space in the home

**A** SPEAKER that can be hung on the wall from a picture rail or hook, or mounted on a bookshelf or window ledge, is a contribution to the modern space problem by C.Q. Audio Ltd. This new speaker, to be introduced at the Radio Show, measures 13 x 17 x 5 ins., covers a frequency range of 50-9,000 cps, and is priced provisionally at £7 7s.

Power handling is of the order of 6 watts, and the enclosure has a contemporary appearance with a finish in neutral colours. The speakers are specifically designed for use with stereo systems where space is limited, but are also suitable for single channel reproduction.

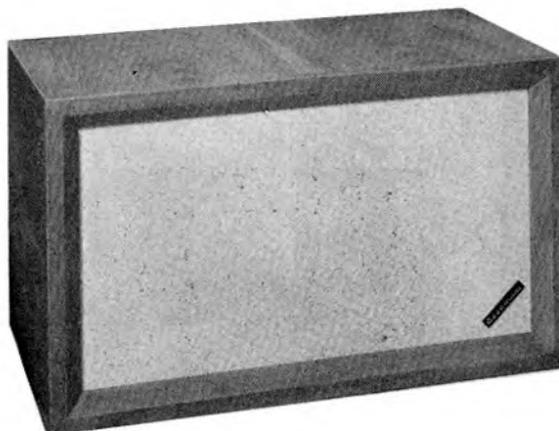
*C.Q. Audio Ltd., 2, Sarnesfield Road, Enfield, Middlesex.*

\* \* \*

On the same space-saving stereo theme, Goodmans Industries Ltd., will be showing their new I.B.3 (Infinite baffle 3-way high-fidelity loudspeaker system). In a walnut veneered enclosure, 24 x 11½ x 14½ ins., there are a bass 12-inch direct radiator unit (35-950 cps), a mid-range pressure driven unit (950-5,000 cps), and a high frequency pressure driven horn loaded unit (5,000-16,000 cps). The enclosure is made from thick non-resonant chipboard treated internally with acoustic damping material, and precise control of the internal dimensions is claimed to ensure matched performance of all units. The price is 57 guineas.

*Goodmans Industries Ltd., Axiom Works, Wembley, Middlesex.*

*The new Goodmans IB3 cabinet with three speakers and a frequency range of 35-16,000 cps*



## WINSTON ANNOUNCE DE LUXE MODEL

**A** NEW tape recorder, the Winston de Luxe, is to be introduced at the Radio Show by Winston Electronics Ltd. Priced at 79 guineas, it is designed "to make a very loud noise very pleasantly."

To achieve this the amplifier has been redesigned and a speaker system has been incorporated consisting of a ten-inch moving coil speaker and two electrostatic speakers for treble. Two feedback loops are used in the circuitry—one for the output stage and one in the pre-amplifier—to ensure large volume levels with low distortion content and to provide from the monitor socket a signal from tape, microphone, radio or record of sufficiently low distortion content to enable it to be fed into large public address systems.

The Winston de Luxe has the Mark IV Collaro deck, 4-watts output and all the facilities of the Winston Thoroughbred. The colours used for the case—maroon, gold and grey—were chosen after trying

out numerous colour combinations on men and women of all ages and several nationalities.

The Winston Thoroughbred, priced at 69 guineas, has a modified and improved output circuit of the amplifying section.

*Winston Electronics Ltd., Shepperton, Middlesex.*

### R.C.A. Innovations

**R**.C.A. Great Britain Ltd. are adding to their range of New Orthophonic High Fidelity equipment a further speaker system to augment their existing panoramic speaker. It comprises three speakers in a ported bass reflex cabinet—available in satin light oak or polished walnut. The price is £56 11s.

A lowboy cabinet of improved design to match the new speaker will also be introduced, together with other innovations of special interest to tape recording enthusiasts.

## THE SPECTONE

**T**HE full details of circuitry and servicing for the Spectone is set out in the servicing manual which is supplied with each machine at the time of sale, but advice on the main problems that may arise is printed on these pages.

### CIRCUIT ADJUSTMENTS

Before attempting to adjust any of the pre-set controls in the circuit ensure that the test equipment to be used for measuring voltages, frequency responses, etc., covers the necessary ranges, and in the case of frequency response tests, has a linear response over and above that of the Recorder.

### 1. AZIMUTH ADJUSTMENT—RECORD/PLAY HEAD

Load a standard test tape onto the recorder and set the speed control to the replay speed of the test tape. E.M.I. frequency test tape type T.B.T.1 is recommended for this test and should be played at a speed of  $7\frac{1}{2}$  ips.

Connect a reliable output meter to the LINE OUT socket of the Recorder, and turn the VOLUME control to maximum, ensuring that the PRE-MONITOR control is in the "OFF" position.

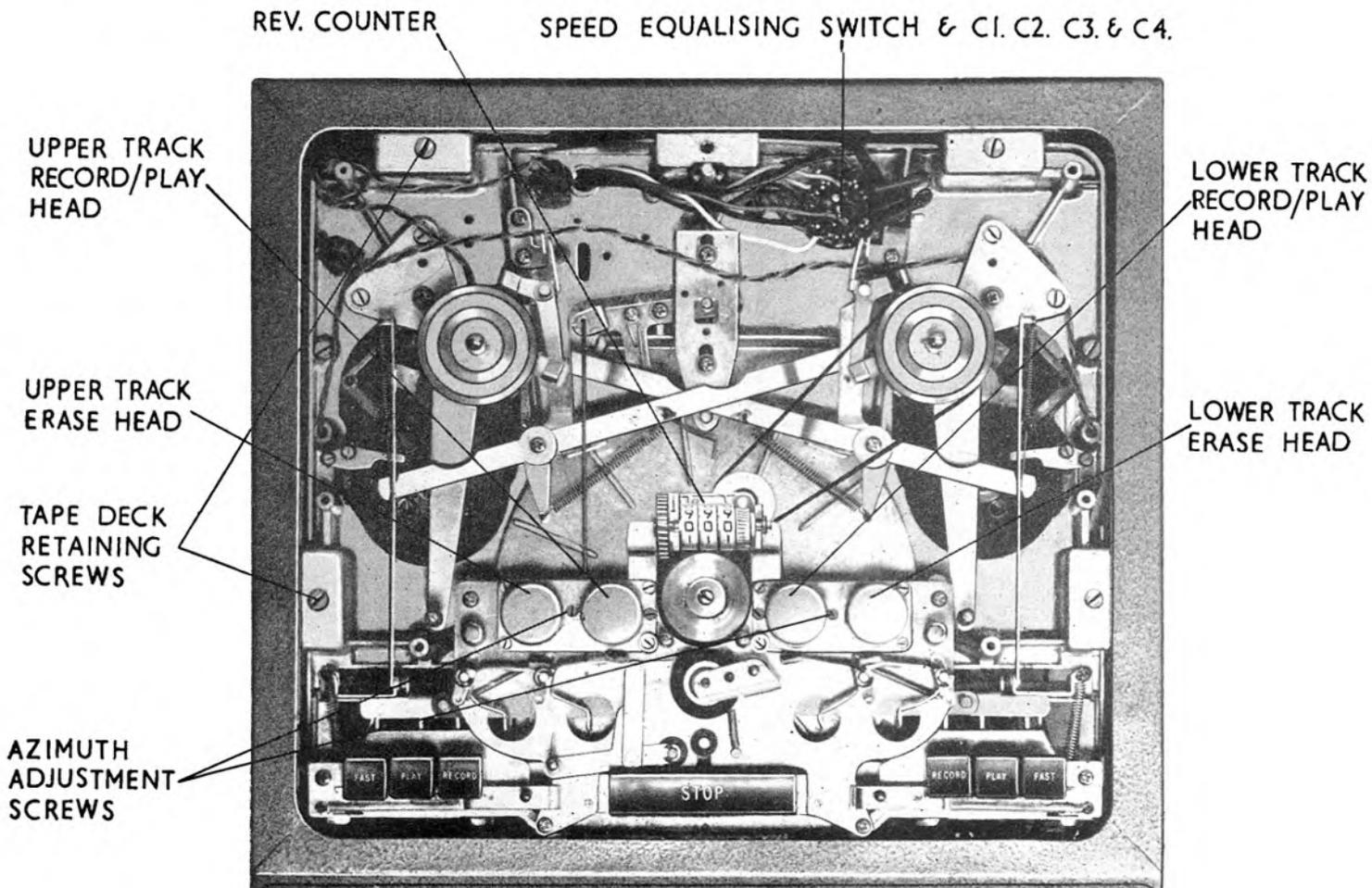
Select that passage of the test tape which contains the highest frequency. The recommended frequency for this test at  $7\frac{1}{2}$  inches per second is 8,000 cps or

10,000 cps. At a speed of 15 inches per second the frequency of 15,000 cps should be used.

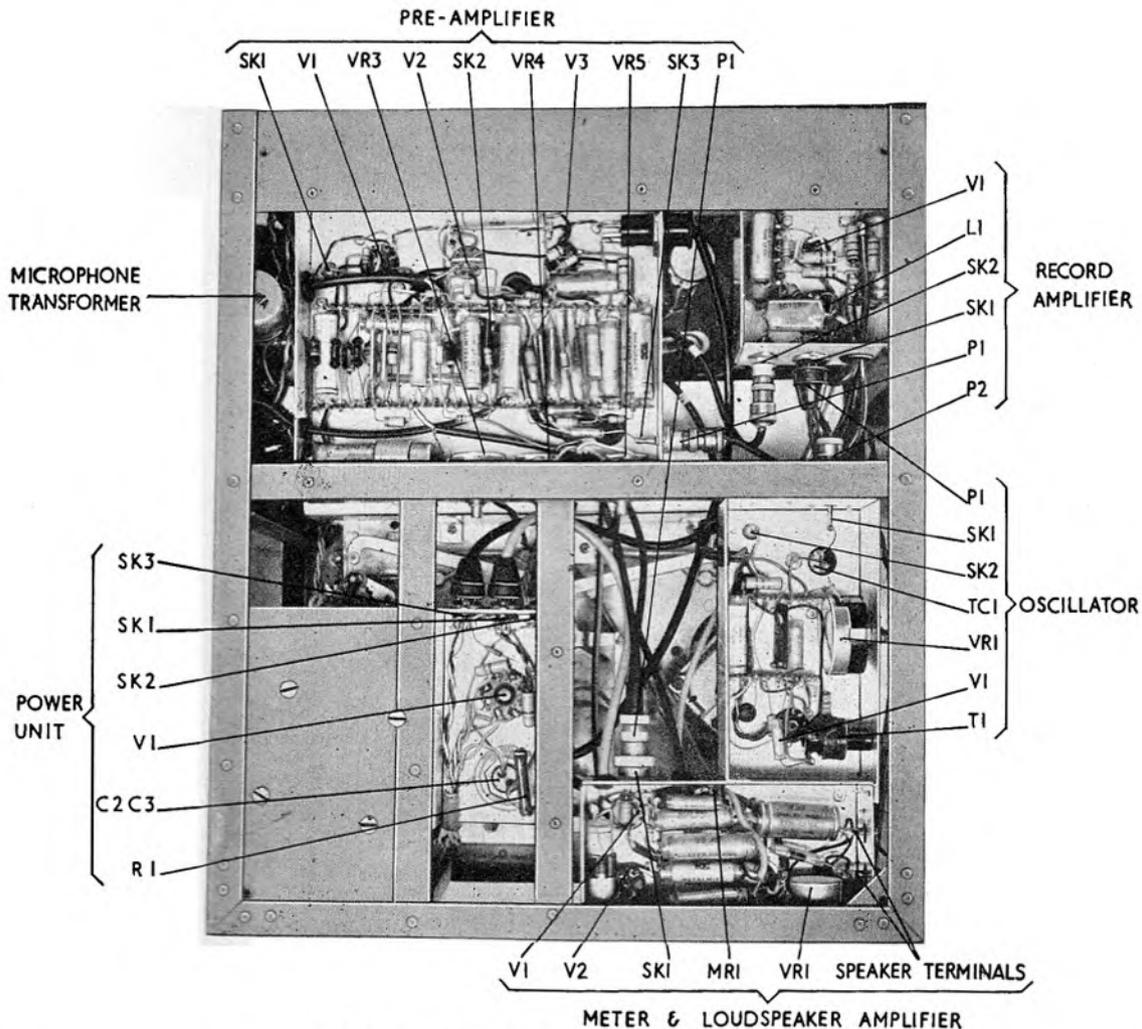
Press the appropriate PLAY button and adjust the azimuth for maximum reading on the output meter by means of the adjusting screw situated at the side of the record/play head furthest away from the capstan. It is emphasised that the screwdriver used for this adjustment *must be constructed from a non-magnetic material*. If insufficient azimuth adjustment is obtained by this screw, the sprung screw on the other side of the record/play head may be slackened or tightened very slightly to facilitate better adjustment.

### 2. BIAS ADJUSTMENT

Connect a suitable Audio Frequency Oscillator to the LINE IN socket of the recorder, switch the PRE-MONITOR control to "ON" and turn the RECORD GAIN control fully clockwise. Switch the Speaker to "OFF" and turn the VOLUME control to fully anti-clockwise.



VIEW OF TAPE DECK WITH COVER REMOVED



UNDERSIDE VIEW OF RECORDER CHASSIS TYPE 151A

Set the Audio Frequency Oscillator to 1,000 cps and adjust the output to give a reading of between 2 and 4 on the recording level meter. Connect an output meter to the LINE OUT Socket. Unscrew the Bias current control (T.C.1) situated on top of the Bias and Erase Oscillator Unit so that the wafers of the trimmer capacitor are fully open.

Now make a series of 1,000 cps recordings screwing the trimmer control one turn clockwise between each successive recording. When the control has been screwed fully clockwise play back the recorded tape noting the passage at which maximum output on the output meter is shown. The correct bias current is obtained at the recorded passage after maximum at which a fall in output of approximately 1.5 dBs occurs. The bias current control should now be reset to the level at which this passage was recorded.

It must be noted that the correct bias setting should be selected with extreme care, as too much bias will cause a severe fall off in top response when recording, and too little bias while increasing the output at the higher frequencies will also

increase the distortion content of the recording.

### 3. BIAS REJECTOR

Connect a suitable high impedance A.C. Voltmeter (preferably a Valve Voltmeter) between the recorder frame and the junction of R7 and L1, in the record amplifier unit. Press a Record button, and adjust the core of L1 for maximum "dip" on the Voltmeter, with the RECORD GAIN control turned fully anti-clockwise.

Separate P.V.C. covered leads should be used with the meter for this adjustment as a false indication is liable to be given if co-axial cable is used due to the comparatively large capacity of this type of cable.

### 4. REPLAY FREQUENCY RESPONSE (PRE-AMPLIFIER)

Load a standard frequency test tape onto the recorder and connect a suitable output meter to the LINE OUT socket. Adjust the VOLUME control to give an output of between 0.2 and 0.3 volts on the output meter when playing the passage of the tape recorded at 1,000 cps.

Play the remainder of the tape and check that the output is within  $\pm 3$  dBs of the level shown at 1,000 cps.

Adjustment of the replay characteristic is affected by the pre-set controls in the pre-amplifier VRs 3, 4 and 5 at  $3\frac{1}{4}$ ,  $7\frac{1}{2}$  and 15 inches per second respectively.

The final setting of these controls should give an output well within the  $\pm 3$  dBs limit as follows:—

$3\frac{1}{4}$  inches per second—40 c/s to 6 Kc/s  
 $7\frac{1}{2}$  inches per second—30 c/s to 12 Kc/s  
 15 inches per second—30 c/s to 16 Kc/s

Now connect an Audio Frequency Oscillator to the line in socket, turn the RECORD GAIN control fully clockwise and the PRE-MONITOR control to "ON" and adjust the output of the Audio Oscillator to give reading of "3" on the recording level meter at 1,000 cps. Switch the Speaker control "OFF" and turn the VOLUME control fully anti-clockwise. Make successive recordings at

(Continued on page 51)

FROM **SOLOIST**

TO **SYMPHONY ORCHESTRA**



THE **SPECTONE**  
TAPE RECORDER

**GIVES THE LIVING TRUTH IN SOUND**

An instrument of professional quality for the high-fidelity conscious, achieving a truly high standard of recording and playback at a remarkably moderate price. Automatic equalisation of output at each speed ensures perfect reproduction.

Incorporating the new Collaro Tape Transcriptor, upper and lower track recordings can be made in quick succession without spool reversal while a safety device prevents accidental erasure.

Three speeds: 3 3/4 in., 7 1/2 in., and 15 in. per second.



**76 gns**  
with microphone

**Specto**  
LIMITED

VALE ROAD

WINDSOR

BERKS

# HOW TO CURE FAULTS

**WE** print below a preliminary guide to fault-finding. In most cases faults will usually be found in the part of the circuit quoted as being the probable cause of the fault; but the probable causes should not be taken as the *only* causes of the fault.

**No recording level indication on meter, but recording and playback satisfactory:** V1a in meter and loudspeaker amplifier not functioning; metal rectifier (MR1) o/c; Pin 1 on plug P1 from pre-amp o/c; meter not functioning.

**No loudspeaker output, but recording, meter indication and playback at Line Out socket satisfactory:** V1b or V2 in meter and loudspeaker amplifier not functioning; Pin 2 on plug P1 from pre-amp o/c; Speaker on/off switch faulty.

**No loudspeaker output and no indication on level meter, but recording and playback at Line Out satisfactory:** Plug P1 from pre-amp o/c or disconnected from socket SK1 on loudspeaker amplifier; V1 in meter and loudspeaker amplifier not functioning.

**No recording, no playback, no indication on level meter and no loudspeaker output, but tape deck operation, "last track used" lights and heaters all satisfactory:** Rectifier valve in power unit not functioning; H.T. fuse (250 m/a) o/c.

**No recording or loudspeaker monitoring from microphone input and no play-**

**back, but recording and loudspeaker monitoring from Line In satisfactory:** V1 in pre-amplifier not functioning; pin 1 on 9-way plug to pre-amp o/c.

**As last item, but with very loud hum when play button pressed:** Co-axial plug P1 from tape deck to pre-amplifier o/c.

**No playback, weak microphone recording, weak Line In recording and weak recording level indication:** V2 in pre-amplifier not functioning; Pin 6 on 9-way plug o/c.

**As last item, but playback satisfactory:** Pin 5 on 9-way plug o/c.

**Very low loudspeaker volume and low output at Line Out socket when monitoring, recording, or playing back, and recording very weak:** V3 in pre-amplifier not functioning.

**Very strong and probably distorted recordings, and no level indication on meter:** Pins 7 or 8 o/c on 9-way plug.

**No microphone recording, but Line In recording and playback satisfactory:** Pin 2 on 9-way plug o/c; Co-axial wander plug and socket from mic. transformer to deck o/c.

**Everything satisfactory except that a very high hum level occurs when 'stop' bar is pressed:** Pin 9 on 9-way plug o/c.

**Recording satisfactory, but very high output level during playback, with very little bass response:** Pin 3 on 9-way plug o/c. Also check equalising switch at back of tape deck.

**No recording, but monitoring, playback and erase satisfactory:** Record amplifier not functioning; Sk3 from pre-amp to P1 on record amp o/c. Co-axial plug to SK2 on record amplifier o/c.

**No erasure and very weak and heavily distorted recording:** Oscillator unit not functioning; Pins 1, 3, 5, or 7 on plug P1 from oscillator unit o/c.

**No erasure, but recording and playback satisfactory:** Co-axial plug to SK2 on oscillator unit o/c.

**No erasure and no recording, but playback and monitoring satisfactory:** Pins 2 or 4 on plug to Sk2 on power unit o/c; Pins 3, 6 or 7 on plug to SK3 on power unit o/c.

**No operation:** Main fuse (1 amp) o/c; Mains ON/OFF switch faulty; Mains input plug faulty or o/c.

**No track indicator lights, no recording, monitoring, or playback, but tape deck functions normally:** Mains input voltage selector knob, not screwed fully home.

**High hum level and distorted microphone recording, but Line In recording satisfactory:** Tape recorder not earthed.

When replacing faulty components ensure that the replacement is of the correct type and tolerance, and in the case of capacitors, that they are of the correct working voltage. On no account must replacement H.T. and Mains fuses be rated above 250mA and 1 Amp respectively.

## Know Your Recorder— No. 8

(Continued from page 49)

all three speeds on both tracks at various spot frequencies according to each speed, ensuring that the input level remains constant at all frequencies by means of a suitable meter across the output of the audio frequency oscillator.

On completion of this recording, play the recording back and measure the output at the LINE OUT socket with the VOLUME control set to give an output of between 0.2 and 0.3 volts on the output meter. Check that the response is within  $\pm 3$  dB of the level at 1,000 cps within the limits quoted above. If an excessive output is shown at the higher frequencies too little bias is indicated and similarly too much bias will be indicated by a fall off in top response. The Bias Level should be reset as described above at a speed of  $7\frac{1}{2}$  inches per second, to counteract any discrepancy in the response at the higher frequencies.

It is recommended that the preliminary setting of the replay frequency response be carried out with EMI test tape type T.B.T.1 at a speed of  $7\frac{1}{2}$  inches per second and the recording characteristic of the recorder checked as described above first at  $7\frac{1}{2}$  inches per second to check response and bias level, then, without adjusting the bias level, record and replay at the remaining two speeds and adjusting the appropriate preset controls

VRs 3 and 5 as necessary. Check the response at all three speeds at the extension speaker socket which should previously be loaded by a suitable 15 ohm load resistor. No appreciable difference should be noted with the TONE control fully clockwise.

### 5. HUM

Connect an audio frequency oscillator to the line in socket and adjust the output level to give a reading of "8" on the recording level meters with the RECORD GAIN control fully clockwise and the PRE-MONITOR control "ON." Make a recording at this level for a duration of approximately 15 to 20 seconds in both directions. Play this recording back and measure the output obtained at the LINE OUT socket with the VOLUME control fully clockwise and the SPEAKER and PRE-MONITOR controls "OFF." The output obtained is the peak output obtainable from the recorder at approximately 2% total harmonic distortion. (Provided that all other settings and checks have been carried out correctly).

Remove the recorded tape from the recorder and remove the Tape Deck Cover Plate as described under "Dismantling." Turn the VOLUME control fully clockwise and press the PLAY button. Adjustment of the hum level as indicated on the output meter at the LINE OUT socket is obtained by vertical and horizontal rotation of the humbucking coils situated at the back of the tape deck. The position of these coils is decided

during the final test and inspection of the recorder at the factory, but under certain conditions the obtainable hum level can be improved by re-positioning of the coils. Fixing is by means of a 6 B.A. screw in the centre of the coil mounting bracket. Care should be taken when drilling the 6 B.A. tapping hole that the position is clear of all obstructions beneath the tape deck.

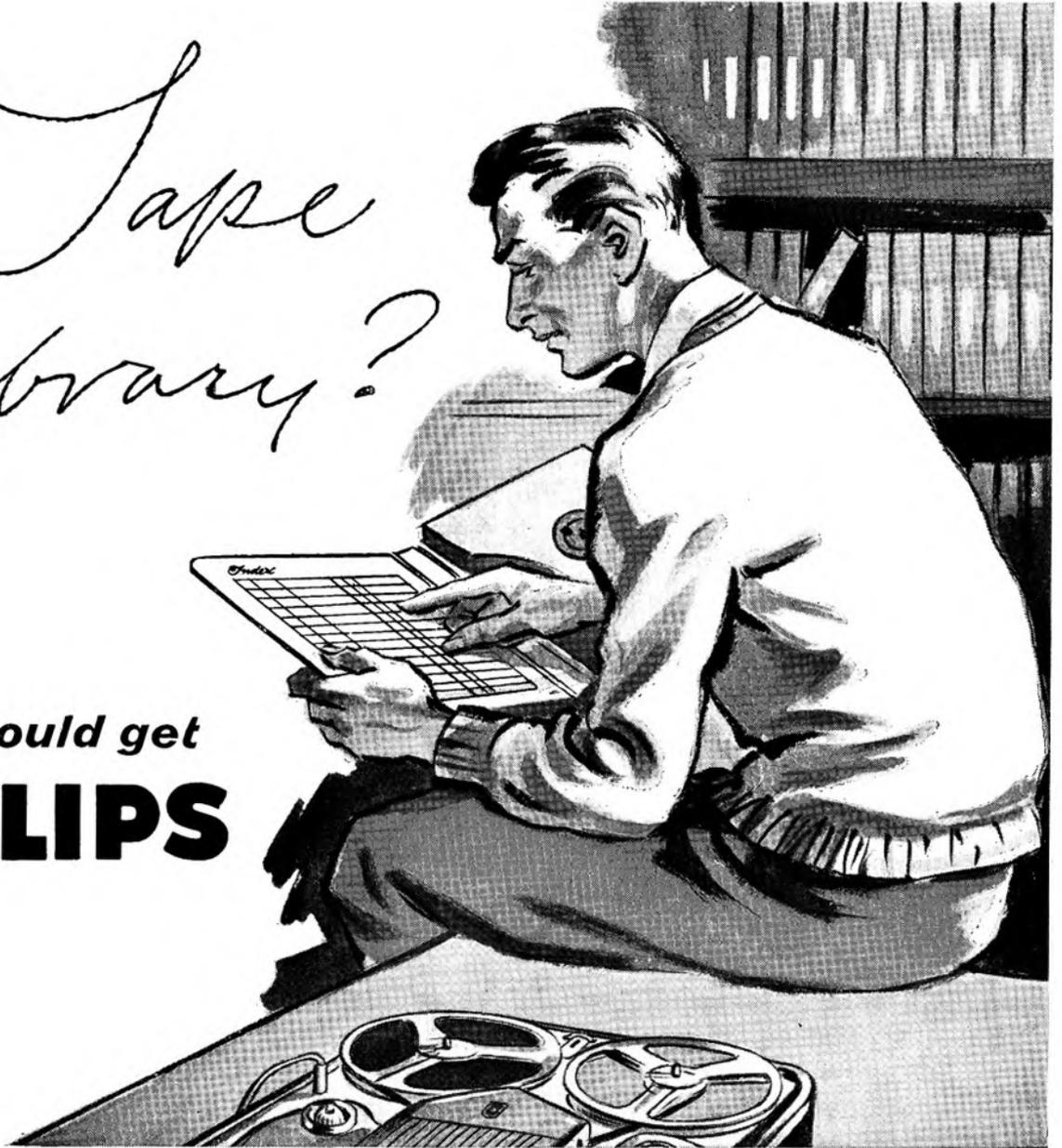
Further adjustment of the hum level is obtained on later models of the recorder by loosening the mains transformer retaining brackets and rotating the transformer about its axis. The obtainable hum level should be better than 45 dBs below the output shown at the LINE OUT socket, when playing the tape recorded at peak.

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TESTED IN THE HOME

## BJ TOP C TWEETER

Price: 5 gns.

Manufacturers: Burne-Jones & Co. Ltd., Sunningdale Road, Cheam, Surrey.

**T**HE appearance of the BJ Top C Tweeter was the first of many pleasant surprises experienced by the writer. The main body enclosing the speaker and cross-over unit is in the form of a wooden tube about  $4\frac{1}{2}$  inches in diameter and  $3\frac{1}{2}$  inches high, and this is surmounted by an artistic but functional brass diffuser wearing a wooden cap. The overall height, including the rubber tipped feet, is about  $6\frac{1}{2}$  inches.

A tweeter is a small loudspeaker designed to give good high note reproduction, but having negligible response at the lower frequencies. Thus, when used in conjunction

with a standard size loudspeaker whose high frequency response is usually limited, the overall performance is enhanced. To obtain the best results, only the high frequencies should be fed into a tweeter, the middle and low notes being left to energise the standard speaker.

This can be accomplished by the use of a cross-over network, the cross-over frequency being that at which one speaker "hands over" to the other.

The Top C Tweeter under review did all that was expected of it—and did it even better than was anticipated. The unit is complete with cross-over network bringing the instrument smoothly into operation from 2 kc/s upwards. The response was virtually free from undue resonances, and extended above the audible limit, to over 18 kc/s. A very useful feature is the incorporation of a volume control, which enables good balance to be obtained. The impedance, measured with the volume control full on, was approximately eight ohms over the working frequency range.

The instrument was tested in conjunction with a high quality amplifier and speaker system, the built in tweeter being disconnected and the Top C wired directly across the amplifier output. The middle and bass-speakers had their own cross-over units. With this arrangement, the reproduction of F.M. radio as well as high quality tape was really superb.

The diffuser was most effective, and the high frequencies were evenly distributed throughout the room. It was found that for best results the instrument should stand at a height approximately level with the ear when the listener is sitting down, but this is not critical.

A further test was more remarkable in its results as it was carried out more for curiosity than with serious intent. The Top C was simply connected to the extension speaker sockets of an average table model radio receiver. The results were just as if a blanket, which had previously covered the receiver, had been removed.

CHARLES LANGTON.



The Burne-Jones Top C Tweeter

## The Sound 777

**T**HE Sound 777 tape recorder is a light-weight machine of 30 lbs. The strongly-made case is covered with red and grey imitation leather, together with a silver-coloured metal grill, and two gilt fasteners. Four brass studs are fitted to protect the recorder during transit, and four rubber feet for when the recorder is in use. Full access to the tape deck is obtained by provision of a detachable lid.

The machine is fitted with the Collaro Mark IV deck, which includes a pause control, digital counter and a safety device to prevent accidental erasure of a previous recording. The speed control has three positions:  $3\frac{1}{2}$ ,  $7\frac{1}{2}$  and 15 ips. Using a 7-inch spool containing long play tape, the playing times per track are: 24 minutes at 15 ips, 48 minutes at  $7\frac{1}{2}$  ips, and 96 minutes at  $3\frac{1}{2}$  ips. Twin track operation is obtained by depressing the appropriate button and this action also brings into operation the record/playback head required for the track selected. No manual reversion of spools is needed. All controls needed for the operation of the deck are situated on the deck itself.

The only other control for the recorder is the combined on/off switch and volume control, situated very conveniently on the slope of the metal grill, together with the record/playback level indicator of the magic eye type.

Three jack sockets are provided: (1) Extension speaker, (2) Radio/Gram input, and (3) Microphone, high impedance input. The deck is foolproof.

The Sound 777 was tested using an FM/V.H.F. radio, a pick-up and transcription motor of the highest quality, and a "Sound" piezo electric micro-



phone. Both speech and music were extremely satisfactory. Several people talking in the room were recorded, using the piezo electric microphone; all the voices were recognised and identified on playback.

At the slowest speed of  $3\frac{1}{2}$  ips reproduction was quite good and this speed is ideal for recording dance music. Personally, I do not think it advantageous to use the 15 ips speed, because of the cost of tape and the fact that excellent quality can be obtained at  $7\frac{1}{2}$  ips. But it one requires the very highest quality, it is there to use.

Although a very pleasing reproduction is to be had on the internal speaker, there is an advantage in using an extension speaker of good quality and with an impedance of 3 ohms. Commercially pre-recorded tapes can be played on the Sound 777.

I found that the wow and flutter were negligible on this machine. Hum level was very low indeed, but there is some background noise, though not enough to be a nuisance.

The makers are Tape Recorders (Electronics) Ltd., 784-788, High Road, Tottenham, London, N. 17.

G.P.



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**EDWARD GREENFIELD**

**REVIEWS CLASSICS ON TAPE**

**W**HATEVER her faults Maria Meneghini Callas is one of the most vital singers in the world today, and her arrival—somewhat belated—on pre-recorded tape is something to welcome. I am particularly glad that for her debut, Columbia have chosen the complete recording of Verdi's *Il Trovatore* with a cast from La Scala Milan conducted by Herbert von Karajan (Columbia CBT 563-5). Callas over the last few years has recorded on disc nearly twenty complete operas, and of all these *Il Trovatore* shows her at her finest.

Callas's famous wobble, her sharp, piercing top-notes and the odd noise she often makes as though she is wearing a muzzle, all these are for once comparatively unobtrusive. Musically, if not quite perfect, this is the sort of performance that in the opera-house would be quite unforgettable. Callas has a way of interpreting every well-known phrase so that it is always interesting in a fresh-sounding way.

Dramatically, of course, she is hair-raising. Leonora, Verdi's unfortunate heroine, is here a great lady (as she ought to be), but one with flashing eyes and great determination. Listen to the magnificent aria *Tu vedrai che amore in terra*, just after the *Miserere* (and in most stage performances criminally omitted) and I think you will agree that this is singing in the great Italian tradition.



The rest of the cast is also outstanding. Callas's usual opposite number, Giuseppe di Stefano, plays Manrico. He is a tenor who can be ungainly in lyric roles, but here his ringing, firm singing exactly suits the part of the Troubadour. Barbieri plays Azucena, the gipsy mother, and Panerai is equally fine as the Count.

But even more than Callas, perhaps, what makes this a supremely dramatic account of the opera is Karajan's conducting. This is not completely in the Italian tradition, but I rather feel that in disciplining his singers and players he has brushed the cobwebs away.

This *Trovatore* set was made in Italy, and that perhaps accounts for its being on single-channel tape. The *Rosenkavalier* set, which I wrote of last month, was made in this country (also with Karajan), and I cannot emphasise too much what a difference the stereophonic recording makes to an opera. It is not just that the characters move around on an invisible stage, but that there is certainly an added breadth at whatever height of fidelity you are reproducing.

I hope more stereophonic tape-decks will soon be available. At the moment, incidentally, E.M.I.'s stereo tapes containing the equivalent of an L.P. disc are 21 shillings less than the single-channel tapes containing the same amount of music.

My only stereophonic tape this month—of Klemperer conducting the Philharmonia Orchestra in Brahms' first symphony—show how impressive stereophony can be in an orchestral work (Columbia BTA 130).

Brahms has often been accused of using unpleasantly thick orchestration, but Klemperer here brings out every strand in the score so that you constantly notice new points (as often as not marked by Brahms and usually ignored). When stereophony is added the result is impressive indeed.

As far as any recording of a classic can be definitive this is so, at least for me. Karajan's version is already available on tape, but Klemperer's is even finer—and not just for the recording alone. Need I rub it in again that it is also shillings cheaper.

# NEWS FROM DENMARK

By K. D. Bothner

Editor of "Band-Amatoren"

IT was a Dane, Valdemar Poulsen, who laid the foundation for tape recording with his "Telegraphone," invented sixty years ago. Today Denmark, with a population of about four millions, has 15,000 to 20,000 tape recorders in use. Interest is growing rapidly, and it is forecast that annual sales of recorders to the Danes will soon reach 12,000 to 15,000.

In November 1953 the Danish Magnetic Sound Club (Dansk Magnettone Klub) was formed, and this remains the only amateur tape club in the country, with more than 200 members in Copenhagen, and some in the countryside (including Greenland).

The members of the Club have a magazine called *BAND-AMATOREN (The Tape Amateur)*, which first appeared in August 1955 and is now published ten times a year. It is read by Danes all over the world, and in Norway and Sweden.

There is wide interest in making contact with British tape amateurs, and there is a plan afoot to arrange a British-Danish amateur tape contest.

Most of the recorders in use in Denmark are of Scandinavian manufacture. Among the most popular are three Danish models, the B and O Unitape, the Eltra 950, and the Movic A3; three Norwegian models, the Tandberg, the Radionette B.5 and the Proton Magnetophon 9; one Swedish model, the Luxor Tamburin; and one Dutch-Danish model, the Philips EL 3516. Grundig is also a well-known name.

All the Danish machines have two speeds, customarily 7½ and 3¼ ips, but the Movic, which is a vertical semi-professional recorder costing about £136, can be alternatively supplied with speeds of 15 and 7½ ips.

The Norwegian and Swedish models all have three speeds, the extra one being 1¾ ips.

Several thousand homes in Denmark still have D.C. supply, especially in the capital, and the only universal recorder is the B and O Unitape, made for operation with 220 volts A.C. or D.C. This machine is also unique in that it is fitted with a turntable enabling discs to be played and recorded direct to the tape. The tape movement is controlled by a single switch. Price is about £95.

The Eltra 950 provides for simultaneous connection of three programme sources, with selection by means of a switch. A fourth source may be added, and mixed with any one of the three programme sources available. This recorder also has a special connection for film, so that the amplifier can be used with film incorporating magnetic or optical sound track. The price is about £105.

The Norwegian Radionette, produced by the leading radio manufacturer in that country, uses a special movable recording head. By turning a switch, it is possible to record or playback either upper or lower track. The Proton Magnetophon is a Siemens product, partly made in the Radionette factory, and the two machines have similarities, including the method of track selection. Both are in the £60 to £70 range.

The Swedish Luxor Tamburin, costing about £100, has a number of features usually restricted to professional equipment.



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# NEWS FROM THE CLUBS

## The Federation



FEATURED above are the six members of the first Committee of the Federation of British Tape Recording Clubs. They are:—

Back row: Left to right: Brian Spring (Glisterspring); Brian Race (Warwick and Leamington); Alan Stableford (London).

Front row: Left to right: Roy Penfold (Coventry); John Amphlett (London); Malcolm Simmons (Coventry).

The Federation is launching its first membership drive. Although there are now thirty Clubs in existence it feels that many main towns are without clubs, although there are recording enthusiasts wishing to join together. Readers wishing to form Clubs are invited by Roy Penfold to write to him at 48, Holbrook Lane, Coventry.

## Voicespondence Club

DUE to the much increased membership the Voicespondence Club is proposing to divide its organisation in the British Isles into two regions—one covering England and one for Scotland, Ireland and Wales. James Sime of 17, Seaview Terrace, Portobello, Midlothian, would like members to let him know by tape or letter their opinions of this proposal. He would welcome suggestions for a title for the Scottish, Irish and Welsh section of the Club. It is proposed to provide all blind V.S. members with a copy of the Club Magazine on tape commencing in the near future. Over fifty new members were listed in the last membership supplement.

## London

LONDON Club held its first Extraordinary General Meeting during July to discuss a Specimen Constitution for the newly formed Federation of British Tape Recording Clubs. Next month the Committee is preparing for its first annual meeting and the election of officers. The group is in touch with the Dansk Magnettone Klub, Copenhagen and an exchange of information is taking place.

## West Middlesex

THE third meeting of this active club enjoyed a demonstration of the Fi-Cord recorder. This proved a popular feature. A tape from Ulster Society was played and a reply recorded. Chairman, Pat Copinger, is leaving the Club and moving to Scotland but he is endeavouring to carry on for the present. Next meeting, Thursday, August 28th at St. Andrew's Church Hall, High Street, Uxbridge at 8 p.m.

## Nottingham

THE inaugural meeting of Nottingham Club has just taken place at the Sherwood Community Centre. Enthusiasts have been advertising locally. All interested are invited to contact Mr. K. Fricker, 10 Sherwood Avenue, Sherwood, Nottingham.

## Sheffield

A RECORDING of a "honky-tonk" session in a local pub was won by Mr. W. Otter in a recent Society competition. Member Jeeves achieved similar success with his entry "A Journey into Space." Ten tapes were entered. The Society is considering issuing a sound magazine.

## Coventry

SECRETARY Roy Penfold, reported back to members on the recent Conference of the Federation of British Tape Recording Clubs. Norwich Cine and Recording Society are exchanging tapes with them. Norman Davidson played the second part of his "famous voices" tape and Secretary Penfold illustrated sound effects, including car crashes, thunderstorms, fanfares and railway trains. While on holiday in Bournemouth, Publicity Officer Ted Bright is paying a visit to the Bournemouth Club.

## Rugby

GRUNDIG, Philips and Gelson tape recorders were among models demonstrated at a recent meeting of the club. Mr. Longmore, Coventry, gave a talk on the work of his society. A tape has been sent to Norwich Cine and Recording Society. Every member present had a word or two to say.

One of the highlights of the meeting was a play on tape which three members had prepared. It is hoped to form a play-reading section. Secretary Mike Brown, and Committee members Ray Voss and Alan Stanley, were present at the recent meeting of Warwick and Leamington Society. Any club or enthusiast wishing to correspond is asked to send tapes at 3½ ips to 219, Clifton Road, Rugby.

## Edinburgh

EDINBURGH CLUB has commenced a new season after a short summer recess. They have received a tape from the Freinos Tape Club, California. During the recess several members recorded the "Sunset Ceremony" performed in the forecourt of Holyrood Palace before The Queen and The Duke of Edinburgh.

## BTRS

THE BTRS Council are holding a meeting together with the TETESSA Tape Recording Club at the "Essex Head," Essex Street, London, W.C. 2, at 6 p.m., on Friday, 29th August.

Items on the agenda include the adoption of a new Constitution for the Society, approval of the appointment of officials and the draw of winning tickets in the prize raffle. The meeting will be recorded.

Maurice Chambers, of 139, Goldthorne Avenue, Sheldon, Birmingham 26, is to act as Blind Services' Secretary of the Society.

## A Literary Circle

A LITERARY CIRCLE for tape recording enthusiasts is the imaginative proposal put forward by Albert Chapman, 31, Dulwich Village, London, S.E. 21. Mr. Chapman asks similar enthusiasts to get in touch with him at this address. He suggests a minimum of organisation. Speeds of 3¼ or 1½ ips would be adequate for the work of the circle.

## IBMTE

THE British Ring of the International Brotherhood of Magicians now has its own Tape Club, known as the IBMTE. It operates on a closed circuit, that is, IBM members only and participation is automatic on submission of a tape to the Secretary, John Walton of Wolverhampton. Tapes have included lectures, tricks and interviews with well-known performers.

## Irish Tape Pals

THIS new association consists of Irish residents and exiles who exchange tape recorded messages by post. It is a special link for those abroad. Address: Eddie O'Neill, 48, O'Connell Street, Limerick. You don't have to be Irish to become a member. The association already has contacts in Spain, South Africa, Australia, U.S.A. and Canada.

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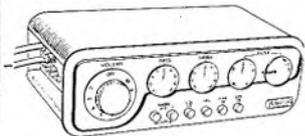
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# TAPE RECORDING GOES TO LAW

(Continued from page 35)

between police and suspected persons, and the suggestion probably arose from the fact that accused persons are so often alleging that their statements have been fabricated or have been tampered with.

Two methods of recording seem to be involved: mechanical recordings, where sound waves are translated into the vibrations of the cutting needle and a groove is cut on wax-like substance (office Dictaphones and gramophones), and magnetic recordings, where the sound waves are turned into electrical impulses and transferred as magnetic changes which vary from point to point on the plastic tape. In assessing the worth of a recording as truthful testimony, the ease with which both these types of recordings can be altered is a vital factor. It is a commonplace that "dubbing," or recording a recording, is a simple task to an experienced operator. With skill, it is possible to eliminate a single word; thus a remark "I am not guilty" could be altered to "I am (slight pause) guilty," the pause before "guilty" only adding emphasis to the apparent confession. But it is also feasible to invent a text in the speaker's own voice which, in fact, he did not speak. For example, the sentence "I am not guilty, but Jones says I am" can be rearranged to read "Jones says I am not guilty, but I am."



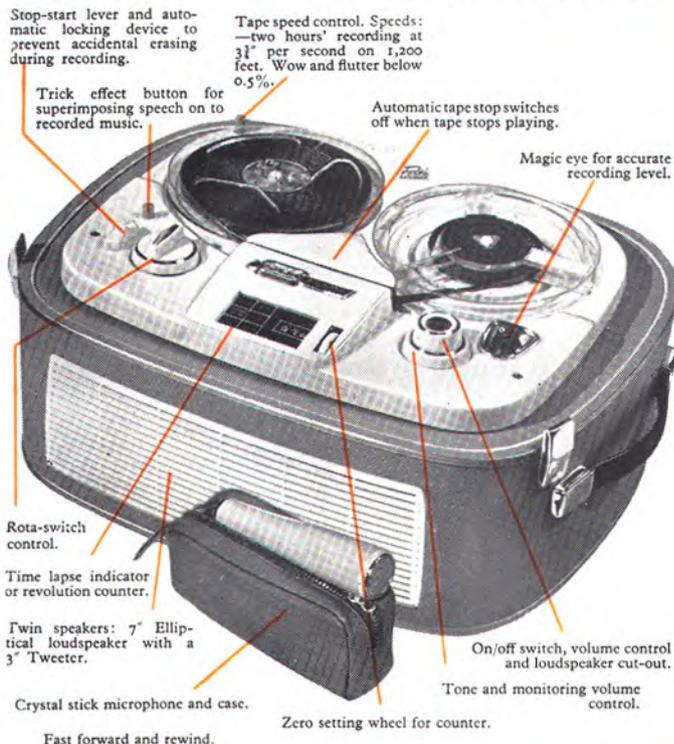
These sinister manipulations are technically easier when tape recordings are used. With a recorder running at 7½ ips, a single word occupies about two inches of tape. Elimination can be effected by the snip of a scissors and the rejoining of the cut ends can be so well done that it cannot be heard. Similarly, the original order of words and phrases can be altered and if, finally, the rejoined tape is dubbed on to a fresh tape there would be no apparent loss of quality and, of course, no joined tape before the court.

It may be that, by imprinting on tapes used for evidence, complex non-repeating wave patterns, like the scroll designs on a bank-note, the possibility of wilful damage to an original tape could be avoided. But any experienced lawyer will say that such complex safeguards always have the disadvantage that they may not convince the average jury. The best safeguard, at once real and understandable, seems to lie in physically guarding the tape as soon as a recording has been made from it.

There is much to be said for tape recordings. A written confession can never contain exactly all that was said. A recorded conversation contains all the colour and shadowing of speech, the full emotional content of what was said, and is an aspect of truth which the written word cannot reproduce. Neglecting forgery, it would be the truth, the whole truth, and nothing but the truth. And it is the mining of that nugget which, even the most cynical lawyer must admit, is the aim of all our complex legal procedure.

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