

NOVEMBER 1966

TAPE

RECORDING MAGAZINE

2¹/₂



IN THIS ISSUE
RESULTS
of the
1966 CONTEST

ALSO

- **VIDEO**; continuing our special investigation
- **Tape Recording techniques**
- **Glossary of Tape Terms**; new products; music reviews; tape exchanges

*Second class postage paid at
New York Post Office, N.Y.*



TO MEET THE STANDARDS OF THE CONNOISSEUR... Ampex 800 Series of Stereo Tape Recorders for sound perfection

Designed to out-perform all other Tape Recorders in their price range, with *solid state* electronics for maximum reliability. A revelation in pure sound reproduction in 4-track Stereo or Mono. For true fidelity recording or hours of the most satisfying listening pleasure this superb Ampex instrument defies comparison at anything approaching the price. Look at the features that put the Ampex 800 Series years ahead: Versatile 3-speed Operation • Precise Dual Capstan Drive • Interlocked Tape Controls

• Lifetime Ampex Deep-Gap Heads • Accurate Record Level VU Meters • Uncomplicated, straight line Threading • Simplified Operation • Die-cast Aluminium Construction • Constant Speed, High-efficiency Motor. Additional features are Automatic shut-off switch—turns off tape transport when tension is lost; automatic tape lifters eliminate head wear during fast wind operations; automatic digital counter allows you to return to a selection on your tape quickly.

AMPEX

Ampex sales and service facilities are conveniently located throughout Europe and the Middle East. For more information write to: Ampex Great Britain Ltd., Acre Road, Reading, Berkshire, England. Telephone Reading 84411 • Ampex S.A. Via Berna 2, Lugano, Switzerland. Telephone 091/3.81.12 • Ampex Europa G.m.b.H. 6 Frankfurt Main, Düsseldorf Strassen 24, Germany. Telephone 252001-5 • Ampex, 41 Avenue Bosquet, Paris 7e, France. Telephone 705.38.10.

BRITAIN'S LARGEST SPECIALISTS

As Britain's largest tape recorder specialists we claim to have an unrivalled selection of the most up to date recorders on display in Gt. Britain. The most experienced staff with expert knowledge. Ideal demonstration conditions with every recorder ready for immediate demonstration and comparison. The finest FREE AFTER SALES SERVICING facilities available. The largest, most centrally situated and accessible showrooms in London devoted exclusively to tape recorders. Exaggerated claims? Don't take our word for it, put our claims to the test and visit whichever of our Showrooms is most convenient to you. You won't be disappointed and it's ten to one that if you are interested in buying a tape recorder you'll become one more of our many thousands of satisfied customers.

- HIGHEST PART EXCHANGES
- OVER 100 MODELS ON DISPLAY
- INTEREST-FREE TERMS
- UP TO 2 YEARS' FREE SERVICE

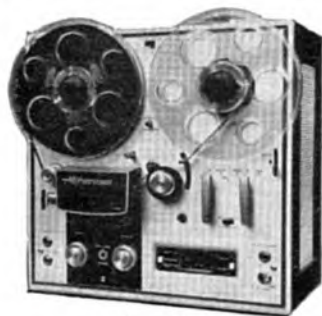
HIGHLY RECOMMENDED



SONY TC260



UHER 4000L



AKAI 1700

TRAVEL FREE TO NUSOUND

To all our customers residing outside the Greater London Area we offer a unique Free Travel facility. For full details by return, write to our Head Office: 191, Plashet Road, London, E.13.

AKAI 355 The world's finest and most comprehensive recorder. Unique Akai Cross Field record head. Completely automatic track reversal and replay. 20 watts output. All transistorised amplifier. V.U. Meters. Freq. 40-21,000. Has to be heard to be believed. **239 gns.**

BRENELL Mk 5M The most comprehensive and finest mono recorder made by this famous British company. 3 heads, 4 speeds. Up to 10½" tapes. Bass, treble controls. Mixing. Before and after record comparison facilities. V.U. Meters. 6 watts output. Separate record/replay amplifiers. **93 gns.**

UHER 4000L A superb 2 track all transistorised battery/mains portable. Unbelievable performance. Freq. 40-20,000. 1 Watt output, 4 Speeds, 5" tapes. Ultra lightweight only 6 lbs. Capable of recording to the highest standards and used extensively by professionals. **103 gns.**

SPECIAL OFFERS!

ELIZABETHAN LZ 507	Brand new 35 gns.
GRUNDIG TK30	As new 32 gns.
SONY 777	Professional Recorder 85 gns.
AKAI M69	As new 35 gns.

AKAI X4 Completely fully transistorised stereo battery/mains portable. Superb performance. 3 Speeds, 5" Tapes. V.U. Meters. 4 Tracks. Operates from rechargeable batteries or mains, unit optional extra. Has own power amplifiers. Freq. 40-20,000. Excluding microphones. **99 gns.**

AIWA TP 1002 Completely portable battery/mains 4 track stereo recorder. 2 Speeds, 5" Tapes. 2 Loudspeakers (one detachable). Separate record/replay controls for each channel. 2 V.U. Meters. Weighs only 7 lbs. Unbelievable stereo performance. Complete inc. two microphones and every acc. Fantastic value. **44 gns.**

VORTEXION WVB One of the most tried and tested models available. This latest model has the new Wright & Weaire 3 speed deck. 3 Motors. 3 Heads. Separate record/replay amplifiers. Before and after record monitoring facilities. 4 Watts. Variable bias. 8½" tapes, etc. **£115.10.0**

TELEFUNKEN 300 A remarkable battery/mains portable tape recorder. Available in both 2 or 4 track models. Extremely portable and a delight to use. Easy to operate push buttons and controls. High quality dynamic microphone incl. Freq. 40-14,000. Wonderful quality. **49gns.**

SONY TC260 A brilliant new 4 track stereo model. Separate record and playback volume controls. Bass and treble controls. V.U. meters. Automatic tape stops. 7" Tape. 2 speeds. Superb Hi-fi quality. Complete incl. 2 dynamic microphones, fantastic value at **97 gns.**

REVOX 736 The stereo tape recorder that sells by reputation alone. One of Switzerland's finest products. Full professional record/replay facilities. 4 Preampifiers. 3 Heads. 2 V.U. Meters. Track to track facilities. Freq. 30-18,000. For the perfectionist. **127 gns.**

SPECIAL OFFERS!

AKAI M7 Stereo	As new 82 gns.
PHILIPS 3549	Inc. accs. As new 39 gns.
COSSOR CR1607 Stereo	As new 39 gns.
FERROGRAPH 4AN	Perfect order 42 gns.

AMPEX 1100 The latest fully automatic 4 track stereo recorder by this world famous company. No tape threading, no turning over of tapes, no track changing. All done fully automatically. Separate V.U. meters. 2 Drive capstans. 4 Heads, etc. The most advanced design available. **150 gns.**

WYNDSOR VANGUARD

The newest model to the famous WYNDSOR stable. 3 Heads. Before and after record/replay facilities. 3 Speeds. 4 Tracks. 7" Tapes. Freq. 40-15,000. 6 watts output. Detachable 8" Hi-fi speaker unit giving superb reproduction. A wonderful value for money recorder at **59 gns.**

B & O 2000 The most comprehensive fully transistorised stereo recorder available. Its facilities are too numerous to list. Available in 2 or 4 track, suitcase or table model versions. A recorder for those wishing to purchase the finest available. **119 gns.**

VIDEOTAPE DEMONSTRATIONS

We are demonstrating at our 82, High Holborn W.C.1 showroom, during the period October 18th to 27th the fantastic PHILIPS VIDEOTAPE TELEVISION CONSOLE. Call into our showrooms and see this fascinating and superb equipment recording television programmes direct off the air or live Video Recordings made with the camera. Don't miss this exciting opportunity for seeing the development of the future now! (Domestic Videotape recorder for under £350 available January 1967).

82 HIGH HOLBORN, W.C.1 (1 minute Holborn Underground)
 242/4 PENTONVILLE ROAD, N.1 (3 minutes from King's Cross Station)
 228 BISHOPSGATE, E.C.2 (1 minute Liverpool Street Station)
 36 LEWISHAM HIGH STREET, S.E.13 (1 minute Lewisham Station)
 2 MARYLAND STATION, STRATFORD, E.15 (adj't Maryland Station)
 205 HIGH STREET NORTH, E.6 (opposite East Ham Station)

CHAncery 7401
 TERminus 8200
 BISHopsgate 2609
 LEE Green 2399
 MARYland 5879
 GRAngeWood 6543

HIGH HOLBORN:
 Monday to Friday 9 a.m. to 6 p.m. Saturday 9 a.m. to 1 p.m.

BISHOPSGATE:
 Monday to Friday 9 a.m. to 6 p.m. Closed all day Saturday.
 Open Sunday 10 a.m. to 2 p.m.

KING'S CROSS, STRATFORD, LEWISHAM, EAST HAM:
 Monday to Saturday 9 a.m. to 6 p.m. Halfday Thursday.

NUSOUND TAPE RECORDER CENTRES



B & O - for those who consider design and quality before price

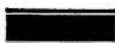


B & O—the quality angle in pickups

The B & O SP6 magnetic cartridge has been designed to provide as nearly as possible the perfect link between the gramophone record and the main amplifier. The diamond stylus is set at the B & O pioneered and now accepted standard of 15° from the vertical. It employs a symmetrical micro-cross armature for excellent stereo separation with minimum cross-talk. Push-pull design reduces harmonic distortion to a minimum. Also available with elliptical stylus (SP8). Result: A superb instrument capable of the highest fidelity.

Frequency response: 20 c/s – 20 kc/s \pm 2.5 dB. Output: 7 mv per channel at 5 cm/sec. Channel separation: better than 28 dB at 500 c/s. Stylus pressure: 1–3 gms. Compliance: 12–15 \times 10–6 cm/dyne. Moving mass: approx. 1.5 mgms. Load: 47K ohms. Mounting: standard $\frac{1}{2}$ " centres (SP6 and 8) or Plug in fitting for B & O arm (SP7 & 9). Weight: approx. 10 gms. Stylus diameter: .0007" Elliptical: .0007" \times .0002" Price: SP6 and 7 £8.8.0d. SP8 and 9 £14.14.0.

Bang & Olufsen—Danish Design—Danish Craftsmanship.



B & O also make the Beogram transcription deck, the Beocord range of Tape Recorders, Beomaster integrated Tuner amplifiers and high quality Beovox pressure chamber loudspeakers.

Write or telephone today for comprehensive colour catalogue to:—

Bang & Olufsen U.K. Sales Division

(A Division of Debenhams Electrical and Radio Distribution Co. Ltd.)

Mercia Road, Gloucester. Telephone: Gloucester 26841

London Showrooms: 70-71 Welbeck Street, London, W.1. Telephone: HUNter 2143.

BBRRROOOWWWW

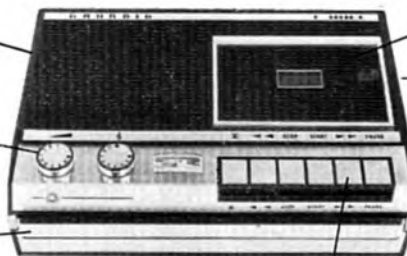


Go anywhere with the Grundig C100 – first portable cassette recorder with high performance and output power!

Twin track, single speed—the C100 can be converted to mains operation by replacing the battery compartment with a mains power pack (optional extra).

Sensitive volume and tone controls. Frequency range 40-10,000 c/s. Fantastic output power of 2 watts.

Retractable carrying handle. The C100 weighs only 7 $\frac{3}{4}$ lbs., costs only 39 $\frac{1}{2}$ gns. complete with dynamic stick microphone.



No tape spools on the C100. Just a simple cassette that plays or records for 1 $\frac{1}{2}$ or 2 hours. Click—it's loaded!

New Grundig DC motor—fully transistorized—and stabilized, without brushes or commutators. Silent operation. No distortion—even if you use the C100 when moving.

Six smooth piano-key controls. Start, Stop/Eject, Pause, Record, Fast forward and Rewind. Recording level meter combines with battery voltage indication.

Please tell me more about the new Grundig C100, and send your 32-page colour catalogue illustrating new Grundig recorders, radios and stereograms.

NAME

ADDRESS.....

.....TRM

Post to Grundig (GB) Limited, London, S.E.26.

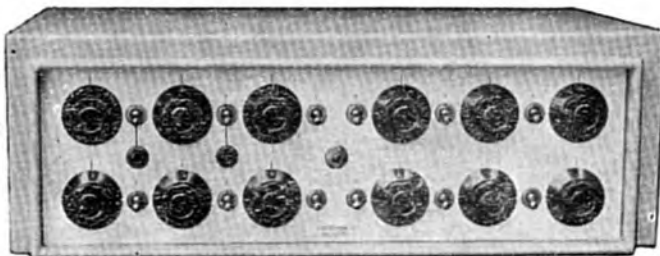


—Vortexion

12-WAY ELECTRONIC MIXER

quality equipment

The 12-way electronic mixer has facilities for mixing 12 balanced line microphones. Each of the 12 lines has its own potted metal shielded microphone transformer and input valve, each control is hermetically sealed. Muting switches are normally fitted on each channel and the unit is fed from its own metal shielded mains transformer and metal rectifier.



FOUR-WAY ELECTRONIC MIXER

This unit provides for 4 independent channels electronically mixed without "spurious break through," microphone hum and background noise have been reduced to a minimum by careful selection of components. The standard 15-50 ohm shielded transformers on each input are arranged for balanced line, and have screened primaries to prevent H.F. transfer when used on long lines.

The standard 5 valve unit only consumes 18.5 watts. H.T. is provided by a selenium rectifier fed by a low loss, low-field transformer in a screening box. The ventilated case gives negligible temperature rise with this low consumption assuring continuance of low noise figures.

20,000 ohms is the standard output impedance, but the noise pick-up on the output lines is equivalent to approximately 2,000 ohms due to the large amount of negative feedback used.

For any output impedance between 20,000 ohms and infinity half a volt output is available. Special models can be supplied for 600 ohms at equivalent voltage by an additional transformer or 1 milliwatt 600 ohms by additional transformer and valve.

The white engraved front panel permits of temporary pencil notes being made, and these may be easily erased when required. The standard input is balanced line by means of 2 point jack sockets at the front, but alternative 3 point connectors may be obtained to order at the rear.

Mixer for 200-250 V AC Mains	...	...	...	£40 8 6
Extra for 600 ohm output model	...	...	...	£1 18 6
Extra for 600 ohm 1 milliwatt output	...	...	...	£3 0 6
Size 18½ in. wide × 11½ in. front to back (excluding plugs) × 6½ in. high.	Weight 22 lb.			

THREE-WAY MIXER and peak programme meter for recording and large sound installations etc.

This is similar in dimension to the 4-Way Mixer but has an output meter indicating transient peaks by means of a valve voltmeter with a 1 second time constant in its grid circuit.

The meter is calibrated in dB's, zero dB being 1 milliwatt-600 ohm (.775 V) and markings are provided for +10 dB and -26 dB. A switch is provided for checking the calibration. A valve is used for stabilising the gain of this unit. The output is 1 milliwatt on 600 ohms for zero level up to +12 dB maximum. An internal switch connects the output for balance, unbalance, or float. This output is given for input for 40 microvolts on 15 ohm.

An additional input marked "Ext. Mxr." will accept the output of the 4-Way Mixer converting the unit into a 7-Way controlled unit. This input will also accept the output of a crystal pick-up but no control of volume is available.

The standard input is balanced line by means of 3 point jack sockets at rear but alternative 2 point connectors may be obtained to order at the front or rear as desired.

The 8 valves and selenium rectifier draw a total of 25 watts.

P.P.M. for 200-250 V AC Mains	...	...	Price on application
Size 18½ in. wide × 11½ in. front to back (excluding plugs) × 6½ in. high.	Weight 23 lb.		
10/15 watt Amplifier with built-in mixers.			
30/50 watt Amplifier with built-in mixers.			
2 × 5-way stereo mixers with outputs for echo chambers, etc.			

Full details and prices on request.

VORTEXION LIMITED, 257-263 The Broadway, Wimbledon, S.W.19

Telephone: LIBerty 2814 and 6242-3-4

Telegrams: "Vortexion London, S.W.19"

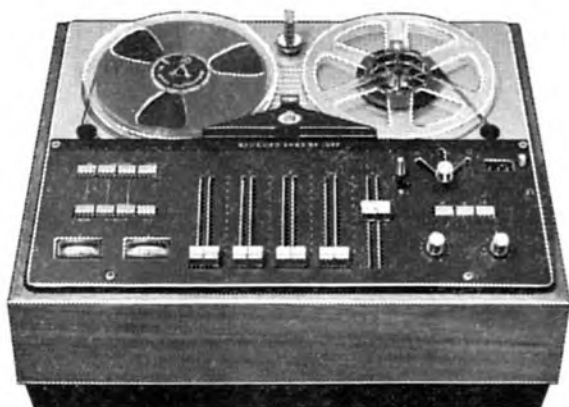
THE

NUSOUND



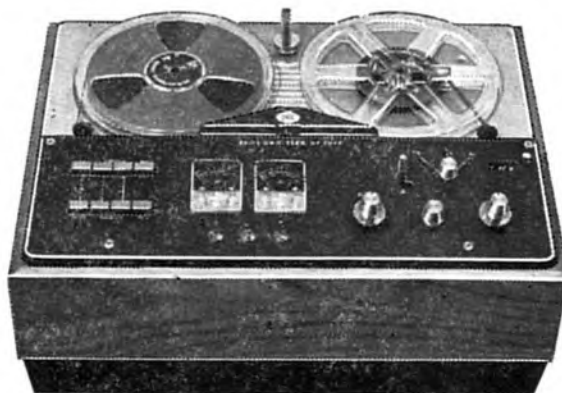
CENTRE

BEOCORD 2000 K DE LUXE



The new Beocord 2000 de luxe has everything—one of the best semi-professional tape recorders. 3 speeds. 7" tapes. 4 heads. Two track record and playback plus 4 track playback. High and low input impedance selectors for gram and radio. 6 way mixing facilities. Separate controls for record and replay. Before and after record monitoring facilities. 2 V.U. meters. Two types of automatic tape stops. Sound on sound. Variable echo facility. Multiplay. 16 watts output. Frequency response 30-20,000 c.p.s. at 7½ i.p.s. Available as table model or suitcase version. **135 gns. or 139 gns.**

BEOCORD 1500 DE LUXE



The ideal stereo tape unit for use with any Hi-Fi System. 3 speeds. 7" tapes. 4 heads. Records 2 track, plays back 2 or 4 track. Before and after record monitoring facilities. Separate controls for record and replay. Switchable high and low inputs on gram and radio. 2 V.U. meters. Two types of automatic tape stops. Sound on sound. Multiplay and echo facility. Superb performance. Frequency response 30-20,000 c.p.s. at 7½ i.p.s. One of the finest tape units available today. **105 gns.**

BANG & OLUFSEN synonymous with the highest quality in tape recorders and high fidelity equipment requires display and demonstration conditions combined with an After Sales Service that do justice to these wonderful products.

At **THE NUSOUND B & O CENTRE** we have a superb display devoted exclusively to the entire B & O range with demonstration facilities "second to none" and an After Sales Service without parallel.

Our expert staff, all 100% B & O enthusiasts, are able not only to demonstrate this superb equipment under ideal conditions but to give you expert advice and technical assistance based upon many years of experience in selling B & O products.

If its B & O you are interested in then there is only one place to visit and that is **THE NUSOUND B & O CENTRE.**



HOW TO GET THERE

Situated only 100 yards from the junction of New Oxford Street, High Holborn and Southampton Row, "The Nusound B & O Centre" is one of the most accessible showrooms in London. Only one minute from Holborn Underground.

FREE TRAVEL

This is a unique facility offered by "The Nusound B & O Centre." Complete coupon today for full details of how you can benefit by this unique offer

Please send me by return a Free Travel Voucher together with full details on Models.....

Name

Address

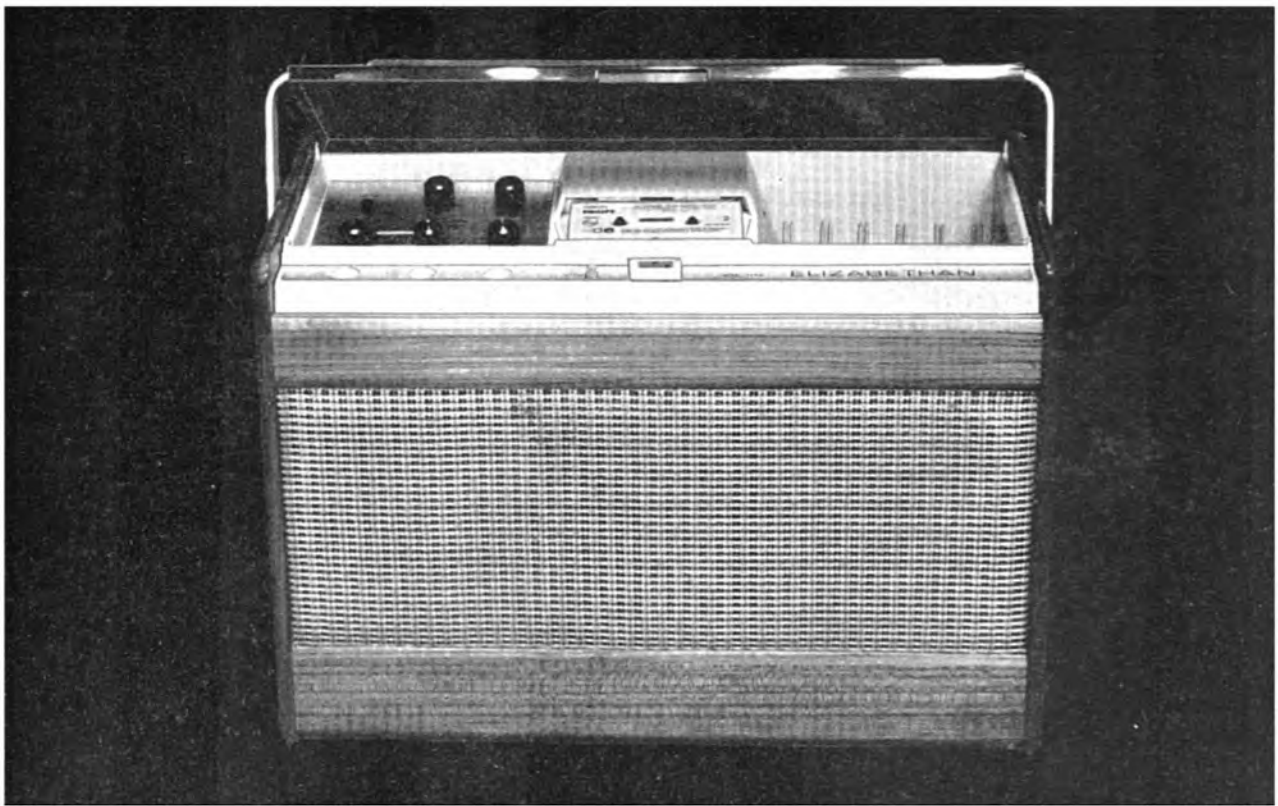
Post to:
THE NUSOUND B & O CENTRE,
82, High Holborn,
London, W.C.1.

THE NUSOUND B & O CENTRE

82, HIGH HOLBORN, LONDON, W.C.1.

Telephone: CHAncery 7401

Open Monday to Friday 9 a.m. to 6 p.m. Saturday 9 a.m. to 1 p.m.



NEVER in the history of tape recorders a machine that looks and sounds like this!

Tall and handsome, cassette loaded and with a wonderful depth of sound (it has a 10 inch round Hi Fidelity speaker). And *only* the fabulous new Elizabethan LZ 612 allows you to slip a 90-minute programme from the top pocket of your jacket—or your handbag—and be listening to it at over 5 watts output, literally in the next second. No wonder this unique machine was the sensation of the Radio Show. Just study its advanced features . . . but better still, go to your Elizabethan dealer . . . hear it . . . and judge for yourself!

- Completely portable, mains/battery and car supply operated.
- Furniture style solid teak acoustic cabinet.
- Specially developed 10 inch round Hi Fidelity speaker.
- Separate bass and treble controls.
- Full mixing facilities via independently controlled inputs.

- Straight through amplifier monitoring providing 'listen while you record'.
- Separate mic, radio and gram inputs.
- Record/battery level indicator meter.
- 90 minutes per cassette playing time.
- 5½ watts output ■ Supplied complete with microphone, tape cassette and leads. **LZ 612 45gns.**

the Sound alone tells you it's

elizabethan

SEE AND HEAR THESE OTHER ELIZABETHAN MODELS, TOO!



LZ 9102T 27 gns
Compact portable battery operated cassette loaded tape recorder weighing only 3 lb.



LZ 32 (twin track) 32 gns
LZ 34 (four track) 34 gns
Brilliant 3-speed mains operated 2 and 4 track recorders.



LZ 102 49 gns
Fully transistorised 4 track 3-speed mains operated recorder with outstanding performance.



LZ 711 75 gns
Complete portable mains operated stereophonic tape recording system for the creation of professional quality tapes.




Why Kodak P.300 tape gives you better high frequency response at low speeds

When you record at speeds below $7\frac{1}{2}$ ips, noticeable high frequency losses will occur, whatever your equipment. But now, with Kodak P.300 Triple Play Tape, you can bring these losses to a lower level than ever before. That's because Kodak P.300 Tape has been specifically designed for low-speed operation and incorporates 'gain' at high frequencies. This enhanced high frequency response at low speeds has not been achieved at the expense of the tape's other features. Its combination of exceptional wavelength response, signal-to-noise ratio and low distortion cannot be equalled by any other triple play tape in the world. What's more, print-through is up by only 1dB on standard play tape. Yet these are not your only benefits. The oxide coating on Kodak P.300 tape is accurate to within *millionths* of an inch, providing incomparable uniformity of output. And this uniformity, together with the flexibility of the specially

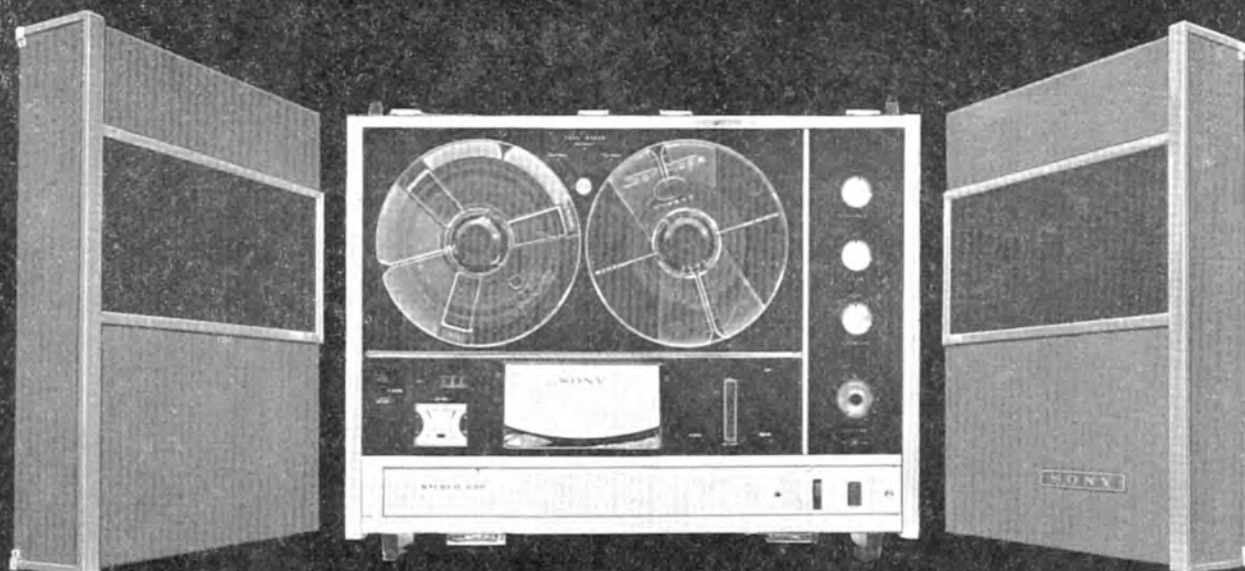
treated base material, gives you complete freedom from drop-out — an important advantage in both low speed and quarter-track recording.

But you be the judge. Try Kodak P.300 Triple Play Tape for your next recording and hear for yourself.

	<p><i>Post this coupon today</i> Please send me full technical data on Kodak P.300 Triple Play Tape.</p>
	<p>NAME.....</p> <p>ADDRESS.....</p> <p>.....</p>
<p>Kodak Ltd., Dept., 70, Kodak House, Kingsway, London W.C.2</p>	
<p style="text-align: right;">2</p>	

Kodak sound recording tapes — the best tapes in the world

Surround Yourself with SONY...



... Quadradial Sound

MODEL TC530—FEATURES ■ 4-track stereophonic and monophonic recording and playback ■ Quadradial (4-way) speaker system ■ High precision all silicon solid state circuit ■ Vertical or horizontal operation ■ "Retractomatic" pinch roller for easiest tape threading ■ 3-speed, full 7" reel capacity ■ Tape position indicator ■ Instantaneous pause control ■ Two illuminated, calibrated VU meters ■ Automatic "Sentinel" tape stop ■ Stereo headset jack. Price 120 Gns.

SPECIFICATIONS:

Power requirements:	100-125V and 220-240V AC, 50/60 c/s 65 watts.	Inputs (cont.):	High impedance Sensitivity—72 dB (0.19mV) 100k ohms) Auxiliary: Sensitivity—22 dB (0.06V).
Tape speed:	7½ ips., 3½ ips. and 1½ ips. instantaneous switching.	Outputs:	Line outputs: 0 dB (0.775V), load impedance 100k ohms.
Reels:	7" diameter or smaller.		Speaker outputs: 2 x 8 ohm.
Recording system:	4-track stereophonic or monophonic.		Binaural monitor output: will accommodate stereo headset Model DR-3C (10k ohm impedance).
Frequency response:	30-20,000 cps at 7½ ips. (±3dB 50-15,000 cps. at 7½ ips.) 30-13,000 cps. at 3½ ips. 30-10,000 cps. at 1½ ips.		
Wow and flutter:	Less than 0.17% at 7½ ips. Less than 0.3% at 3½ ips. Less than 0.4% at 1½ ips.		
Power output:	5W R.M.S. per channel.	Dimensions:	19½" wide x 9½" high x 15⅞" deep.
Signal-to-noise ratio:	Better than 48 dB (at peak record level).	Weight:	41 lbs. 10 ozs.
Harmonic distortion:	Less than 3% at 0 dB line output.	Accessories:	Stereo recorded 5" tape, 7" reel. Two SONY dynamic microphones (F-96). Integrated record replay connector type RK-46 60c/s Motor pulley, Reel cap, Head cleaning ribbon, Splicing Tape.
Level indication:	Calibrated VU meter x 2		
Tone controls:	Separate controls for bass and treble.		
Inputs:	Low impedance microphone inputs: transistorised (will accommodate any microphone from 250 ohm to 1K ohm impedance).		

SONY®

RESEARCH MAKES THE DIFFERENCE

See your local Sony dealer now or write to:- Sony U.K. Sales Division, Mercia Road, Gloucester. Tel: Gloucester 26841. London Showrooms: 70-71 Welbeck Street, London, W.1. Tel: HUNter 2143.

Yours for less than one-third the actual price



TIROS



MARINER



POLARIS

Actual size of all pictures 16½" x 14½"

3M Company commissioned these beautiful full-colour prints of Tiros, Mariner and Polaris from Oleg Stravrowsky, internationally famous painter. Each one is authentic in every detail, each one could be yours for a mere 7/6 (plus P & P) and the tartan tab from a reel of 'SCOTCH' Magnetic Tape.

Framed in white painted wood in contemporary style, either individually or as a set, they make fascinating and educational decoration for a study, a boy's bedroom or, because the colours and designs are so good, for your living room.

The research that leads the way in space

3M Company research has provided communications systems for much of the space programme. The same research developed 'SCOTCH' Magnetic Tape with Superlife, used by tape enthusiasts all over the world. The most stringent precautions and meticulous standards are essential for all equipment used in space — the same standards are applied to the recording equipment sold to you.

You can get your Tartan Tab from any reel of 'SCOTCH' Magnetic Tape, 4" size or over.

Scotch

MAGNETIC TAPE

first with the new ideas

To: **3M Company, SPACE, 3M House,
Wigmore Street, London, W.1.**

Please send me — tick which
Tiros Mariner Polaris
I enclose tabs—one for each
and cheque/P.O. for

(Each print 7/6 plus 2/- postage and packing)

NAME

(BLOCK CAPITALS)

ADDRESS

.....

T 1

STICK YOUR TARTAN TABS HERE

Offer closes 31st Jan. 1967



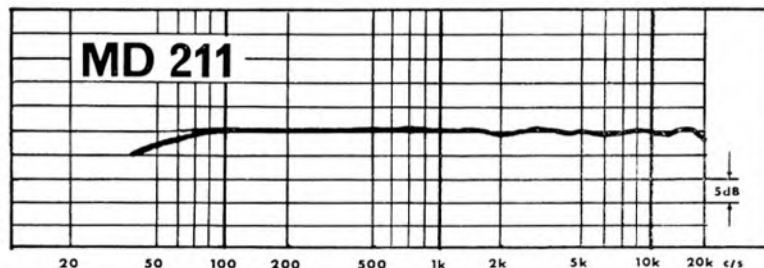
Minnesota Mining & Manufacturing Co. Ltd., 3M House, Wigmore St., W.1. HUNter 5522
3M and SCOTCH are trademarks of Minnesota Mining and Manufacturing Company.

Introductory Offer

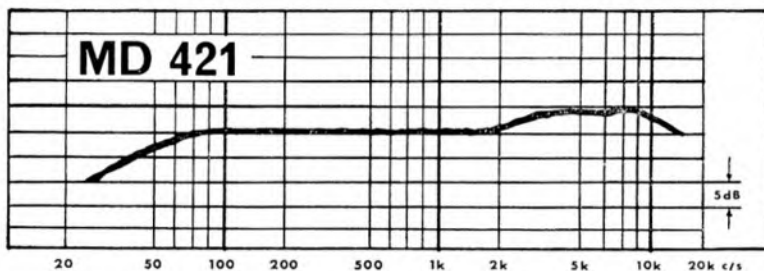
FREE TRIAL AND 20% DISCOUNT
(For ONE month only)

by **Sennheiser**

Quantity production has now brought these microphones within the price range of the serious amateur.



The finest moving-coil microphone in the world. Condenser quality from a rugged dynamic capsule. Response **guaranteed** ± 2.5 dB of curve shown. Omni-directional characteristic — 200 ohms impedance. **Price £35.15.0.**



Dynamic Cardioid for studio and outside broadcasts. Variable bass cut and integral presence lift (see graph) to broadcasting specification. Over 30,000 already in use. Dual impedance 200 ohms/30,000 ohms. Windshield available. **Price £32.10.0.**



We are so confident that a short test will convince you of the outstanding value of these microphones, that we have arranged for you to try one of these with your own equipment **free**. Furthermore, for the month of **November** the price is reduced by 20%. Send us details of your tape recorder (so that we can send a suitable cable) and a returnable deposit as shown below. If your equipment matches the quality of the microphone you will want to keep it, and there is nothing more to pay. If you decide to return the microphone, your deposit will be returned immediately (providing the microphone is returned in good condition within 10 days).

Deposit for MD 421: £26.0.0.; MD 211: £28.12.0.

Audio Engineering Ltd.

33 ENDELL STREET, LONDON, W.C.2 TEMPLE BAR 0033

Tandberg model 9 the world's finest Monaural Tape Recorder



A new facia in the finest Scandinavian design tradition plus Tandberg precision audio-engineering now combine to make the Tandberg Model 923 the monarch of portable, monaural tape recorders.

The Tandberg Model 923, 2 track, 3 speed ($7\frac{1}{2}$ ips, $3\frac{3}{4}$ ips, $1\frac{7}{8}$ ips) machine includes a formidable built-in speaker and amp system of the highest quality which provide exacting performance standards without any auxiliary equipment.

Superlative sound, functional simplicity, clean design, the classic look of teak combine to make the Tandberg Model 923 the ultimate in the field of portable, monaural tape recorders. Price: 69 GNS.

Model 8 (2 speed version) available from 54 GNS.

Sooner or later you'll turn to Tandberg -why not sooner?

Tandberg

ELSTONE ELECTRONICS LTD.,

81 Kirkstall Road, Leeds 3.

Telephone: Leeds 3-5111 (7 lines)

Please send me full details of Tandberg 923 or 8

NAME

ADDRESS

TRM 7

TAPE

RECORDING
MAGAZINE

Vol. 10

No. 11

November 1966

IN THIS ISSUE

Tape trends and tape talk	394
<i>By the Editor</i>	
Results of the 1966 British Amateur Tape Recording Contest	395
A Report on the Contest	395
<i>By the Editor</i>	
Video—Another TRM Special	396
Tape recording techniques	398
<i>Denys Killick</i>	
On the Fringe	400
Glossary of tape terms	401
<i>Harry Mack</i>	
Cross Talk	405
<i>By Audios</i>	
Readers' Letters	411
Jazz on tape	412
<i>Mike J. Gale</i>	
Popular music on tape	412
<i>Don Wedge</i>	
Tape Bookshop	413
New Products	414
Tape Exchanges	418
Advertisement Inquiries Service	421

COVER PHOTOGRAPH: *Charlie Griffiths, West Indies famous fast bowler, in a peaceful mood as he records comments on the Aldwych scene by his colleagues Rawle Brancker and Rohan Kanhai before setting off on a tour of London sights. Charlie is using the Philips EL.3301 cassette recorder which was supplied to the team, together with Musicassettes, during their stay in England.*

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

"TAPE Recording Magazine" is available by a postal subscription of 25s. per annum (U.S.A. \$3.75) including postage, or it can be obtained at newsagents, bookstalls and radio and music dealers. In the event of difficulty, write to the Publishers at 7, Tudor Street, E.C.4.

Back numbers, if still in print, are available at 2s. 6d. per copy.

Address all communications

7 TUDOR STREET, LONDON, E.C.4

EDITORIAL

FLEet Street 1455

Editor,
R. DOUGLAS BROWN

Advertisement Manager, VIVIENNE GOODING

ADVERTISING

LUDgate 9088

Managing Editor,
DENYS G. KILLICK

Tape trends and tape talk

By the Editor

I HAVE MET some ambitious enthusiasts over the past ten years, but Philip Towell, founder-secretary of the Boston Sound Hunters and a British Contest winner on more than one occasion, takes the biscuit! He has just moved into a new house and the heart of the building is a sound studio 36 feet long and 23 feet wide. Last month the Sound Hunters invited their friends to a demonstration there and there cannot be a club in the world with comparable headquarters.

I cannot improve on the description of the studio sent me by Mr. Towell: "It is 36 feet long and 23 feet wide at one end, the other end being four feet shorter. No one wall is parallel to another, so that the sound waves cannot bounce back on themselves, causing distortion. The south wall is all double-glazed, from floor to ceiling, and the cunningly-designed cedar shingle roof overhangs, to give an attractive little terrace looking towards the river, where ships can be seen passing to and from the docks.

"The studio ceiling rises from eight feet high to some 14 feet, sloping up to a set of pivoting clerestory windows set in the roof, and catching all the sun.

"The shorter angled wall is clad in natural cherry boarding, giving a warm glow to the room, and reminds one that the owner is a director of one of our leading timber firms. A rich gold Wilton carpet and scarlet curtains (in which the gold is repeated) over the full length of the room, makes a grand splash of colour, which is accentuated at night by swivel spotlights set in the ceiling.

"Covered by a picture is a sound-proof double window of BBC pattern, and a noisecheck door off the studio leads into the monitoring room. . . Part of the skirting board slides up to reveal a pipe for microphone cables to be fed into the studio."

It's enough to make the BBC jealous—particularly that terrace, with the ships passing.

* * *

I REFERRED TWO months ago to the first Czechoslovakian amateur tape recording contest. I now have a full account of this event, supplied by my good friend, Wilhelm Gluckert, of Mainz, who was there as an adviser and observer. It makes clear that tape recording is now developing rapidly as a hobby in the countries of Eastern Europe and there seems hope of early contact between east and west.

Herr Gluckert tells me that the Czech radio sponsored the contest. Radio Prague, it seems, has a regular weekly programme for the "phonopamateurs," as they call them there, and it was around this programme that the first contest was organised. Three hundred tapes were received.

The best six have been submitted, I understand, as Czech entries in the International Contest, CIMES, and I am keenly looking forward to hearing them at the judging in Hilversum, and to meeting the representatives of the Czech movement.

Herr Gluckert adds that the Polish radio was represented at the Czech contest and evidently the amateur movement is developing well there, too. The possibility has been broached of holding future CIMES judging in Eastern Europe. It would be an exciting extension of the activities of the International Federation of Sound Hunters.

* * *

THE BRITISH ENTRIES in CIMES are, I think, well up to the standard of previous years and there seems to me to be a sporting chance that, at the presentation party at the Criterion in Piccadilly Circus on Friday, November 4, there may be one or two CIMES prizes to add to the array of silver trophies and piles of tape which—along with the top award of £100—will be distributed that night.

This party will round off the 1966 contest, the last of the series of three sponsored by the leading firms in the tape field. A lot has been learned from the expanded effort which the backing of these firms has made possible and it is my earnest hope that they will now agree to continue their sponsorship and that the Contest will be developed in accordance with the lessons learned to date.

I expect to learn a lot, too, from the experience of the BBC with the contest they are running from Manchester. I have been invited there on November 13 to help with the judging.

* * *

THE CONTINUED INCREASED DEMAND for *TAPE Recording Magazine* and an adjustment in our distribution arrangements may still be causing some temporary difficulties in some parts of the country in picking up a copy casually from your nearest bookstall. So, if you want to be sure of your copy, place a regular order with your newsagent, please.

THE RESULTS

TAPE OF THE YEAR

"EXCERPT FROM MACBETH"—The witches' cavern scene, with the competitor portraying all the characters. 7 min. 57 sec.

Entered by A. Brown, of Mitcham, Surrey.
The Emitape Challenge Cup, donated by E.M.I. Tape Ltd., together with a prize of £100.

NOVICE AMATEURS

1st "GRANDFATHER'S CHRONOCLASM"—A humorous musical tape with the traditional tune, "My Grandfather's Clock." 2 min. 15 sec.

Entered by K. McKenzie of Sunderland, County Durham.
The Scotch Trophy, donated by Minnesota, Mining and Manufacturing Co. Ltd., together with a prize of £10 and £15 worth of magnetic tape.

2nd "DREAMS OF NORTHUMBRIA"—A folk song specially composed for this Contest. 3 min. 42 sec.

Entered by C. Blair, of Sunderland, County Durham.
The Agfa Cup, donated by Agfa Ltd., together with a prize of £10 of magnetic tape.

3rd "TRAINS"—A stereophonic recording of train movements. 4 min.

Entered by E. Fitzgerald, of Hawick, Scotland.
The Acos Cup, donated by Cosmocord Ltd.

ADVANCED AMATEURS

1st "BREEZE AND I"—A musical performance by the competitor, using multi-tracking techniques. 2 min. 30 sec.

Entered by P. Griffin, of High Wycombe, Bucks.
The Philips Shield, donated by Philips Electrical Ltd., together with a prize of £10 and £15 worth of magnetic tape.

2nd "NEGRO SPIRITUALS"—Stereophonic performance of a medley of well-known spirituals. 6 min. 8 sec.

Entered by J. Shuttleworth, of London, S.E.9.
The Kodak Shield, donated by Kodak Ltd., together with a prize of £10 worth of magnetic tape.

3rd "SARABANDE AND FINALE"—Stereophonic recording of an Amateur String Orchestra in a work by Corelli. 5 min. 11 sec.

Entered by W. P. Copinger, of Kilmarnock, Scotland.
The Irish Trophy, donated by Elstone Electronics Ltd.

GROUPS

1st "THE MAKING OF A MASS"—A dramatised account of the stereophonic recording of a choral Mass. 7 min. 56 sec.

Entered by R. Partridge, for the Oxford University Tape Recording Society.
The Amphlett Shield, donated by the Federation of British Tape Recording Clubs, together with a prize of £10 and £15 worth of magnetic tape.

2nd "TUTTI"—Stereophonic recording of a humorous choral version of a nursery rhyme. 3 min. 55 sec.

Entered by G. Furneaux, for the South Devon Tape Recording Club.
The BASF Shield, donated by BASF Chemicals Ltd., together with a prize of £10 worth of magnetic tape.

3rd "THE BUS RUN"—A feature tape of a coach outing, by Class 1S2 of St. Peter's RC Secondary School, Aberdeen. 7 min. 52 sec.

Entered by Mastertape (Magnetic) Ltd.
The Mastertape Trophy, donated by Mastertape (Magnetic) Ltd.

British Amateur Tape Recording Contest 1966

A REPORT BY THE EDITOR

Alan Brown, of Mitcham, who submitted "The Tape of the Year" in the 1966 Contest, is only 20 (though he has had eight years' recording experience). After hearing his brilliant "Excerpt from Macbeth," Eric Robinson, who was one of the judges, remarked "What will he do when he's 40?"

This tape is, indeed, a *tour de force*. Apart from recording, Mr. Brown acted all the roles himself in the opening scene—the witches' scene—from Macbeth. The contrast in voices he secured largely by changing pitch by varying recording speeds: not a simple doubling or halving of normal tape speeds, but slight variations only, secured by using a Brenell deck and equipping it with specially-prepared capstans. The sounds of the wild heath were skilfully added.

Mr. Brown is a real enthusiast—that is obvious from the list of equipment he used: the Brenell deck, a Ferrograph machine, Reslo ribbon and Grampian DP4 mikes, a home-built mixer, a ring modulator, oscillator and amplifiers.

A slightly longer version of this tape was part of an entry which earlier won Mr. Brown a Duke of Edinburgh's Gold Award.

Another tape which particularly appealed to the jury was Mr. P. Griffin's "Breeze and I," an outstanding example of multi-tracking. Mr. Griffin played six musical parts separately, recorded them separately, then mixed them together while adding yet another part! Music and multi-track recording is his special enthusiasm and he spent three days in his garage completing this effort, which emerged as the best entry in the Advanced Amateur class.

The judges did not find it quite so easy to pick the winners of the Novice and Group sections. Among the novices, Mr. K. McKenzie's "Grandfather's Chronoclasm" stood out for its lively beat. This again was a good exercise in multi-tracking, a nice blend of music and sound effects. One of the judges suggested it would have been even better if it had ended with a cuckoo cry!

The Oxford University Tape Recording Society, which has featured in previous prize lists, emerged as the winner of the group section with "The making of a Mass"—a recording of an Oxford choir, the Schola Cantorum Oxoniensis—at rehearsal. The judges concluded that the recording was seeking after a sense of drama which was not quite realised, but nonetheless it was a fine recording.

The overall standard of entries this year was well up to the average of earlier contests, but cannot be said to have exceeded it. The question is raised: how much farther can we expect amateur achievement to go? Technically, some excellent results are now regularly achieved. In presentation, in imaginative treatment of a chosen theme, there is still a long way to go.

The judges were: Douglas Brown (Chairman), Donald Aldous, John Crabbe, Timothy Eckersley, Alan Freeman, John Gilbert and Eric Robinson.



Our test outfit in use. The image on the screen is not very clear in the photograph owing to reflections from the ceiling

THE Video Tape Recorder is at last a reality—if one can afford or justify the rather large outlay required, or put off buying that new car until next year. Recently the Japanese Sony Corporation laid plans to provide a model for the UK market. It will be similar to that supplied to North America but compatible to the UK 405 line TV transmissions, priced at approx. 350 gns. for the V.T.R. and monitor, plus 125 gns. for the complete camera and tripod

The production line in Japan is not yet in full swing and bulk deliveries are not expected to be available before the end of 1966. However, Sony UK showed a number of working prototypes similar to the production job at this year's Earls Court Radio Show. One of these was made available to us for test and examination.

The Videocorder arrived in two substantial and highly professional looking grey suitcases, the larger weighed 66 lb. and contained the Video Recorder and the monitor/receiver (looking for all the world like the normal Sony 9-inch Portable TV). The smaller case contained in well padded compartments, the camera, a substantial tripod with pan head, microphone and various connecting leads, splicing kit and head cleaning material.

Examination of the deck showed a clear and functional control layout and what at first appeared a bewildering tape threading sequence. The $\frac{1}{2}$ -inch tape passes over the drum holding the rotating heads in a shallow diagonal to achieve the favoured economical "helical scan." The two heads rotate against the tape at 25 rps, allowing the very low tape speed of $7\frac{1}{2}$ ips to be used, resulting in about one hour's recording time from a reel of tape—making one feel distinctly better about the apparently high cost of video tape, which averages £12 for this length of recording.

On the right is the main function control panel, a simple, 3 position electro-mechanical operation for play, rewind and stop; a separate fast forward control provided. To the right of this is the record button which can be used independently of the

main tape transport control to enable the Videocamera to be accurately set up and monitored on the screen before recording commences.

Next to the record switch is the recording source selector, a simple two-way switch labelled "TV" and "Camera." One VU meter is fitted, but adjacent to it is a 3 position switch selecting "AC voltage," "Video" and "Audio" respectively. The needle centred in the green segment of the scale indicates accurate levels of AC voltage and Video signal. Audio level is shown by fluctuating deflections as with a normal tape recorder. Video and Audio levels are adjusted by 2 concentric controls to the right of the panel. A separate pull switch controls the motor which must be put into the "Standby" position immediately the tape has been stopped or the rapidly rotating heads would quickly wear grooves in the tape.

One tends to expect to find the controls of a V.T.R. as complicated as an analytical computer, but after assessing those of the "Videocorder" it is a relief to find how simple they actually are. The monitor/receiver, in appearance and controls, is in every respect a normal TV receiver with the exception of a two-way switch on the front panel marked "TV" and "Camera." This switch selects the programme source.

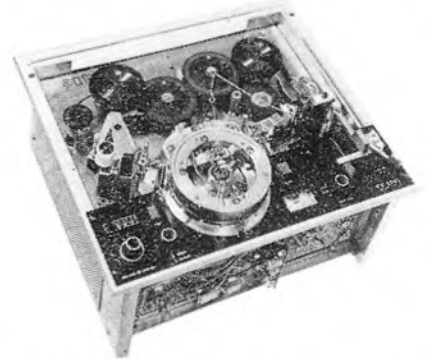
Turning finally to the camera, this is as straightforward as a cine camera in operation. Of course it has no motor or shutter but it does have the addition of connections to the rear—mains and video leads, and an adjustment marked "Focus." This operates the concentration of the Videcon to the camera lens and not the optical focus as might be supposed. The tripod is substantial and offers pan and tilt facilities plus a crank controlled elevation offering an immediate variation in height of approximately two feet.

Having studied the operational technicalities of the "Videocorder," power was connected and an aerial lead inserted into the appropriate socket on the Receiver/Monitor. Switching on the Receiver/Monitor and selecting channel 2 immediately brought forth a picture due to complete transistorisation. A little correction for contrast and brilliance was needed and

there emerged a beautifully clear image on the screen. Standing back four or five feet from the receiver removed any indication of line, a refreshing sight in this day of 23-inch monsters! The "Videocorder" was switched on and the "Record" button was pressed into the TV position. "Video" was then selected and the VU meter needle advanced in the scale into the green segment; finally Audio was selected and similarly adjusted. The record button was depressed and held down and the tape control moved into the "forward" position.

The mechanical noise could be best described as a quiet "purr." Sound level on the monitor could be controlled independently and reduced to zero for silent recording. Replaying the recording and switching the monitor between TV and Tape, a direct comparison could be made. The recorded quality was fractionally lower than that of the original, but certainly no less than that of a domestic receiver adjusted for slightly less than absolute optimum performance.

Attention was then turned to the camera and the necessary simple switching operations carried out. The Videcon was focussed and, under quite normal domestic lighting an image appeared on the screen. Aperture and focus were adjusted. To obtain optimum quality the addition of a directed 100 watt



With the covers removed the rotating head assembly is clearly seen

floodlight produced a first class picture. The microphone was connected and audio level adjusted. Recording commenced.

The immediate and dramatic success of our very first recording confirmed the simplicity of the entire operation. Various subjects were suggested and in each case it was only necessary to adjust the floodlight and camera by reference to the image on the screen, check the video and audio levels and start the spools turning.

It was particularly noted that there was no blur or ghost image apparent when the camera was panned on a moving subject. This was surprising as the effect had been noted previously on other, more expensive, equipment.

As out test recordings continued the need for editing quickly became apparent. We had on our tape a random collection of unrelated sequences with gaps between. It

(Please turn to page 406)

It's **NEW!** **MODEL 633**

Guaranteed for 3 years



**An instrument for the connoisseur...
Designed to a strict specification
Built to endure**

- * Three operational speeds:
633— $1\frac{7}{8}$, $3\frac{3}{4}$ and $7\frac{1}{2}$ i.p.s.
633H— $3\frac{3}{4}$, $7\frac{1}{2}$ and 15 i.p.s.
- * Monitoring of recorded programme.
- * Comparison by "A-B" switching.
- * Switched bias control.
- * Level meter reads on both record and playback.
- * Mixing facilities with separate gain controls.
- * Modular construction to provide maximum service accessibility.
- * Separate record and replay heads.
- * Separate record and replay amplifiers.
- * Fully compensated input socket for magnetic pick-up.
- * Spot erase.
- * 3 watts undistorted output.

Model 633 120 gns.
Model 633H 125 gns.

Ferrograph
the incomparable tape recorder

The 633 is the latest addition to the Ferrograph range and is intended for the serious home recorder as well as the professional user. Each instrument is supplied with an abstract of actual performance in the form of a test certificate. Spare parts—as with all Ferrograph instruments—are guaranteed available for at least 10 years.

Interested? Then complete and post this coupon to:
THE FERROGRAPH CO. LIMITED
84 Blackfriars Road, London, S.E.1.

- Please send me the FREE illustrated Ferrograph leaflets.
- Please send me the comprehensive 64-page model 633 Ferrograph Manual, for which I enclose £1—refundable when I purchase my Ferrograph.
(Tick items required in box at left)

NAME _____

ADDRESS _____

TM 5 _____



TAPE RECORDING TECHNIQUES

DENYS KILLICK continues his series with a practical discussion about microphones and their uses with suggestions for test recordings.



A typical application for an omni-directional microphone. Script readers group around a Sennheiser MD 211. Note the drawn curtains

properly use even an expensive, professional microphone to its best advantage unless certain basic information about the instrument is known, how much more difficult would it not be to get the very best out of a cheaper instrument under amateur conditions?

CHECK THE IMPEDANCE

All microphones are said to have an impedance and the value of that impedance is one of the first things we want to know. This is expressed in ohms. The simple rule to follow is that the impedance of the microphone must match the impedance at the microphone socket into which it is being fed. This latter figure can be established by reference to the recorder manufacturer's specification sheet. Provided this rule of matched impedances is observed, then any microphone can be used with any recorder. The only exception occurs in some early tape recorders where a polarising voltage was applied to the microphone socket, and in these cases, now fortunately rare, only the microphone recommended by the manufacturer should be used—similarly those same microphones cannot be used without the polarising voltage.

So firstly check the impedance at the microphone socket by referring to the specification sheet and then examine your own microphone. It would be very nice to be able to say that all microphones are marked with their impedance values. Unfortunately this is not so. However, if your microphone was supplied with the machine then its impedance can be taken to be that quoted in the specification sheet. Nearly all mains domestic recorders utilise what is known as a "high impedance" microphone input. If the rule is followed we are, with such machines, restricted to the use of high impedance microphones only.

One of the characteristics of the high impedance microphone is that it should only be used on a relatively short cable, whereas low impedance microphones may be used on cables of any reasonable length, say up to half a mile. The advantages of long cable runs are obvious. For many recording jobs separation between the machine and the microphone is vital and this can only be achieved by using low impedance microphones.

With domestic equipment the difficulty is easily overcome. When a low impedance microphone, together with its extended cable, is used, a matching line transformer is inserted in the cable run converting the low impedance to high and thus making it suitable for feeding into the equipment. Line transformers should always be positioned in the cable within about twelve inches of the microphone input socket; this is to keep the high impedance end of the cable as short as possible. Long high impedance microphone lines are liable to pick up electrical interference and produce hum. This danger is lessened by keeping the "high" end as short as possible, but care must be taken to avoid close contact between the transformer and mains supply cables or other sources of possible interference.

Departures from the rule of matching

LIVE RECORDING

FIRSTLY, to those many readers who are following this series our apologies for having to break the sequence last month. The exciting news of video developments occupied so much space that "Tape Recording Techniques" was literally squeezed out. The management of the Sound Department in both video recording and in sound-and-cine depends entirely for its success on a proper understanding of the fundamentals of sound recording and microphone technique, although the specific application of those techniques will be very different to pure sound applications. A thorough knowledge of microphones, their types, and how to use them, is essential to any sound recording and it is therefore appropriate that this article should follow our special video feature.

Live recording involves the use of a microphone. It also involves the use of recording equipment (tape recorder) and, quite obviously, the sound source—or subject to be recorded. These are the three essential ingredients to any live recording and of them only one, the microphone, is normally variable. The recorder will be the machine one happens to own, the sound source will be the subject it is desired to record. When these facts are known, we can, in theory at least, decide in the light of the circum-

stances which would be the best kind of microphone to use and how we should position it. In practice it may well be that only a single microphone is available and there is no choice. This needn't worry us because an understanding of the kinds and types of microphones available will at least enable us to use the single instrument we have to its best advantage.

A glance down any reputable dealer's list of tape recorders being offered for sale will reveal what may appear to be a surprising anomaly. Most of the machines in the medium- to low-price bracket are offered for sale at a price inclusive of microphone; machines in the medium to high bracket are usually offered for sale at a price exclusive of microphone. At first it might appear that this is an unreasonable state of affairs. The truth is that microphones are highly specialised instruments and it is assumed that the person buying a more expensive, or "professional," machine will either own microphone equipment himself or alternatively will wish to purchase the kind of microphone that will be suited to the recording work to be undertaken. There is no such thing as the "ideal" microphone which would be equally suited to all kinds of recording. The microphone which might be excellent for one job could be useless for another.

The notes given here are not intended to apply only to expensive microphones. Even if the microphone you happen to own is a humble instrument of uncertain origin you may be quite sure that it will fall somewhere within the categories about to be mentioned. As it is impossible to

impedance will result in loss of sensitivity, a deterioration in the signal to noise ratio and attenuation of some parts of the audio frequency spectrum. Gross mis-matching can result in an extreme loss of sensitivity to the point where no signal is received at all. Impedance is a property of all microphones and knowledge of its value does not indicate either the **kind** of microphone or its **directional pattern**.

THE BASIC DIRECTIONAL PATTERNS

All microphones have what is known as a directional pattern. No microphone can be used properly unless this directional pattern has been established. There are three basic directional patterns and they are:—

1. **Omni-directional** or equally sensitive to sound coming from all directions.
2. **Figure-of-eight** or sensitive to sound on the front and rear faces of the microphone, but relatively dead on the two sides.
3. **Cardioid or heart-shape**; that is, sensitive on the front face but relatively dead on the rear.

These directional patterns are usually indicated diagrammatically as shown in figures 1 to 3, but it is most important to remember that these patterns are three dimensional and not in a single plane. In other words a truly omni-directional microphone would be equally sensitive to sound as if it were in the centre of a sphere and not just in the middle of a circle around its face. In fact an omni-directional microphone will tend to discriminate against certain frequencies approaching from particular angles. The pattern obtained in laboratory tests would therefore not be quite a true sphere at all frequencies.

Similarly a figure-of-eight microphone progressively rejects certain ranges of frequencies as the sound source moves around towards its sides. The sides themselves should only be regarded as "relatively" dead; in practical use some sound is bound to "creep" around to its front faces. The same holds good for the cardioid directional pattern.

The ability of a microphone to discriminate against sounds coming from certain known directions is invaluable. It is the basis of quality recording. By the use of an appropriate directional microphone we can reduce the effect of room reverberation. There is a big difference, acoustically, between a domestic living room and a sound studio. It's much simpler to change the microphone than to change the room. Properly orientated a directional microphone will reduce the level of unwanted sound, such as traffic noises from a window. On the other hand an omni-directional instrument would be needed to record, say, a large group of people having a discussion or reading scripts. Those taking part would be arranged in a circle with the microphone at its centre. A figure-of-eight microphone would be useless for such a plan.

All owners of microphones should check on the directional patterns of their instruments if not already known. In its simplest form this is very easily done. Take a recording of a sound as it moves, three dimensionally, around the microphone. As the sound source most readily available is one's own voice, record this as you walk around the microphone, being careful to remain equidistant from it. As you move, say where you are in relation to the microphone.

Continue the monologue around the face of the microphone and then up and over the top, following on round to the underside. Playback of the tape will immediately reveal the directional pattern. If in doubt, regard the microphone as omni-directional. Cardioid or figure-of-eight microphones will give an obvious result that could not be mistaken. Do not imagine that your own microphone is too insignificant to have a directional pattern. All microphones have directional patterns which can be established in the manner described.

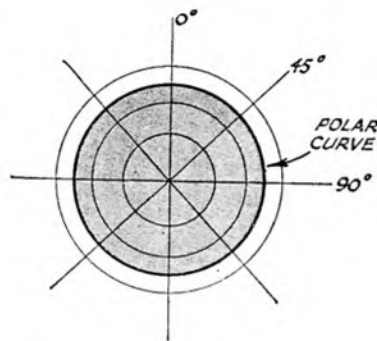


Fig. 1. The directional pattern of an omni-directional microphone, sensitive to sound from all directions

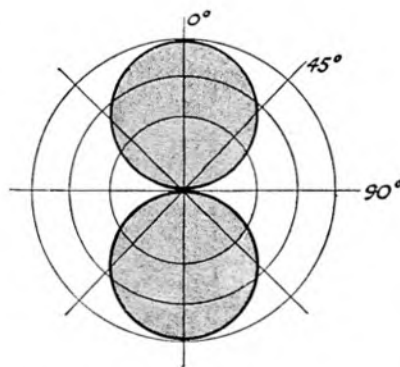


Fig. 2. Figure-of-eight: live front and rear, dead at the two sides

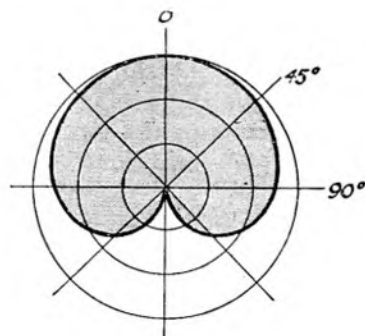


Fig. 3. A Cardioid response, relatively dead at the rear

Top Right: An A.K.G. D 12 in use. This is a cardioid moving-coil, shown here with singer Freda Ryans



THE FIVE GROUPS OF MICROPHONES

Nothing we have so far said about microphones is directly related to the principles on which they operate. These may be classified, according to design, into five main groups; carbon, crystal, moving coil, ribbon and condenser. Each group has its own distinctive properties.

Carbon microphone inserts must be mentioned because there are probably more of these than any other kind. Their main use is in telecommunications where they perform a valuable service in the hand-sets with which we are all familiar. Their very limited frequency response makes them unsuitable for quality recording. They are ideal for the purpose for which they were intended, being cheap to produce, robust and small in size.

Crystal microphones are the first we can consider for serious recording work. At a cost ranging from a few shillings to about five pounds they are very robust and so will withstand a certain amount of ill use. Their output is high. The frequency response of a crystal microphone usually falls short of the accepted full range needed for top quality of music or speech. Impedance is always high so they cannot be used on a long mic. cable. As their directional pattern is omni-directional they will pick up sound from any angle. These microphones are generally regarded as good all-round instruments of low cost. Higher priced microphones of other types will give better results as might be expected. If cost is the limiting factor and the short cable does not matter then a crystal microphone is indicated.

Moving coil microphones form a most interesting group, prices ranging from a few shillings to upwards of £100. Many of the small, plastic-cased microphones offered with recorders and supplied at an inclusive price are simple instruments of this type.

The simplest kind of moving coil microphone is omni-directional. These instruments are highly suited to outdoor recording of all kinds as they are not likely to suffer physical damage from the action of wind, although this may be picked up as a grating, harsh sound in the recording. Wind shields are sold to minimise both this

(Please turn to page 406)

NOW Only from IRISH!



FREE 30" color coded leader and 30" trailer plus metal reversing strip with every 3, 5, 5 3/4 and 7" reel. Identify tapes easily. Saves wear and tear. Gives you extra usable tape footage. Automatically reverses tape on equipped machines.

plus these additional benefits

- Signature Binding — handsome simulated leather with gold writing foil to index contents.
- Every reel of Irish tape is unconditionally guaranteed.
- Irish — pioneers and still a leader in magnetic tape design and manufacture. You can't buy a better quality tape.
- Every reel of Irish tape specially treated with Ferro Sheen® process for an extremely smooth surface. Minimizes tape head wear.

AND NOW AVAILABLE

Irish Video Tape for home, industry and educational use.
Irish lubricated tape for CARtridges and endless loop applications.

MORHAN EXPORTING CORP.

458 Broadway, New York, N.Y. 10013 • Cable Address: Morhanex

INTERNATIONAL BRAND TAPE

Finest quality American made Tape—at lowest ever prices! Fully g'reed			
3 in. Message tape, 150 ft.	3/6	5 1/2 in. Long play, 1,200 ft. Acetate	12/6
3 in. Message tape, 225 ft.	4/11	7 in. Standard play, 1,200 ft. Mylar	12/6
3 in. Message tape, 300 ft.	7/6	7 in. Long play, 1,800 ft. Mylar...	19/6
3 1/2 in. Triple play, 600 ft. Mylar	15/-	7 in. Double play, 2,400 ft. Mylar	25/-
5 in. Double Play, 1,200 ft. Mylar	15/-	7 in. Long play, 1,800 ft. Acetate	15/-
5 in. Long play, 900 ft. Acetate...	16/-	7 in. Triple play, 3,600 ft. Mylar...	58/6
5 in. Standard play, 600 ft. PVC...	8/6	Post 1/- per reel—4 reels & over Post Free	
5 in. Triple play, 1,800 ft. Mylar...	35/-	Clear Plastic Spools (empty): 3" 1/6,	
5 1/2 in. Double play, 1,800 ft. Mylar	22/6	4" 2/-, 5" 2/-, 5 1/2" 2/3, 7" 2/6. Post 6d.	

BROCKLEY TRADING CO., (Dept. TM), 378 Harrow Road, Paddington, London, W.9 CUN 9530

Disc and Tape Library Recording Developments offer loan facilities of their thousands of Discs (45's, 78's, LP's) and Tapes. WE WILL PRODUCE PROGRAMMES of your choice (Pop, Classical, Comedy, Background, Party) with or without introductions. Your own tape used if required. ALSO FULLY EQUIPPED STUDIO (300 sq. ft.) for solo, group orchestral, choirs, etc. All inquiries to: 75, Cramlington Road, BIRMINGHAM 22A. (Telephone: GRE 3779.)



NEW Size 15 SOLDER DISPENSER
For transistors, printed circuits, small components. 21 ft. coil of 60/40 alloy, 22 s.w.g. in dispenser for quick, easy soldering. **3/- each**



BIB PROFESSIONAL RECORDING TAPE SPLIGER



Complete with razor cutter
A handy precision tool for quick and accurate editing—no wastage or post editing clicks. Pays for itself by using up all your odd lengths of tape. Chrome plated. **18/6 each**

Obtainable from High Fidelity and electrical shops or write to:
MULTICORE SOLDERS LTD., HEMEL HEMPSTEAD, HERTS.

ON THE FRINGE

A new monthly round-up of news from the world of hi-fi

TAKING A STROLL THROUGH THE HI-FI LABYRINTH

THE recording enthusiast soon finds his interest in his hobby embracing the very wide field of "Hi-Fi" and all its associated equipment. Paraphernalia, some might call it. But how intriguing this world of amplifiers, tuners and speakers can be. It can also be confusing—and expensive.

One can't get away from the fact that good quality equipment is needed for good reproduction of sound. There's no such thing as *perfect* reproduction; all we can try to do is to approach the original as closely as possible. In terms of pure quality it would be absurd to expect to get better out of our recorders than we feed in. If we record from a poor radio source the result must be a poor recording.

When following the traditional British pursuit of "listening to the wireless" we might not pay too much attention to the quality. A radio programme is transient; we listen, it is heard and then it is gone. Record it and its impermanence becomes permanence. Every time that tape is heard the imperfections will be repeated. The listener's annoyance will increase to the point where the tape will either be erased and re-recorded, or will be put on one side and never used again.

The term High Fidelity is misleading. If fidelity is truth, what is "high" truth? On the other hand "Hi-Fi" is a popular and convenient description which can be tied as a label to a piece of equipment, endowing it with an aura of respectability joined to a price in guineas instead of pounds. Unfortunately it has come to be accepted, rather like the Good Housekeeping Seal of Approval, as representing something tangible. Regrettably it is sometimes used to deliberately mislead. We await in vain the arrival on the market of apparatus proudly and honestly announced as "low fidelity."

The only safe path through the hi-fi labyrinth is to cautiously follow makers' specifications. Cautiously, because even they may be worded ambiguously. The very best advice that can be given to anyone who is searching for really good equipment is to buy only that which carries the name of a manufacturer who, like Caesar's wife, is above suspicion. There are many of them, their products are excellent and often no more expensive than inferior equivalents.

One last word of warning—the really inexperienced should never trust their own ears. The sense of hearing has to be educated. What might sound wholly acceptable today might become a rather nasty, grating sound tomorrow. The sound that might be pleasant in a dealer's show-room might not be at all pleasant to live with.

Living with high fidelity provides the key to the whole problem. Good class equipment is likely to serve faithfully for all, or at least most, of your listening life. It's one of the longest term investments you can make. So the choice should always be slow, careful, considered and deliberate. Like a good wife, good equipment is a joy to live with and will doubtless be a comfort in one's old age. But a bad wife. . . .

A glossary of tape terms— part 9

BY HARRY MACK

SIGNAL.—Electrical impulses that convey the information, qualified by external factors, such as noise, distortion, when used to designate the "goodness" of an amplifying channel. For purposes of comparison, and exact measurement, the signal is related to its input and output, with noise and distortion quoted.

SIGNAL LEVEL.—Sensitivity of an amplifying channel can be quoted as a signal level required to obtain a standard output. Alternatively, the signal level may be a measured output obtained from a standard source.

SIGNAL-TO-NOISE RATIO.—Ratio of output voltage from a tape recorded at 100 per cent modulation and replayed at a specified distortion level to the noise voltage from the system plus the tape noise itself. Readings of complete output level can be taken and compared with readings derived from replaying an unmodulated tape. A good tape recorder should have a signal-to-noise ratio better than 40 dB, i.e. 100:1.

SINGLE TRACK.—More correctly, full-track, denoting a recording made across the whole width of the tape. Much professional work is single or full-track recording, to facilitate editing and improve signal-to-noise ratio.

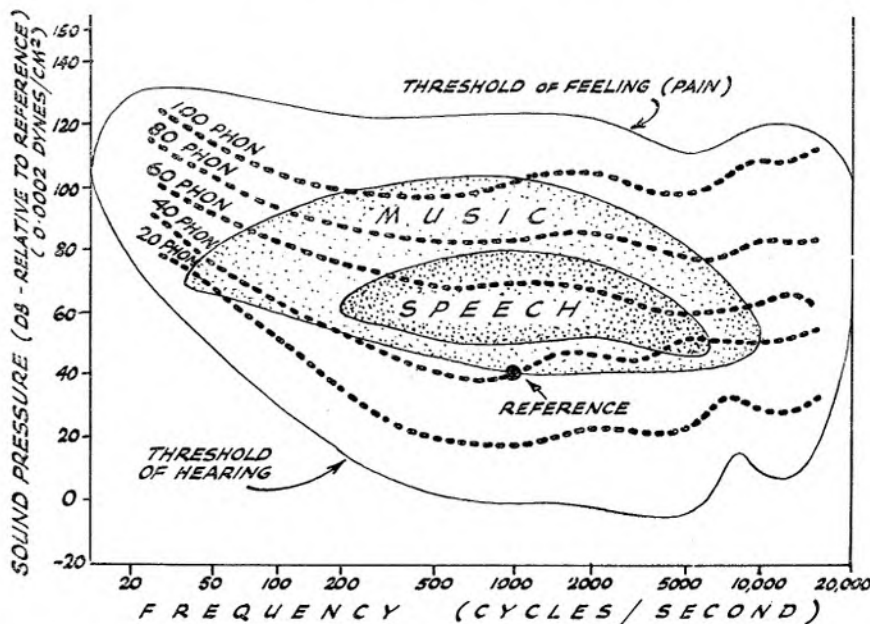
SLEEP-LEARNING.—Method of using a tape recorder to replay set lessons via a "pillow loudspeaker." The principle of hypnopaedia has been known for centuries, but only since the tape recorder has been developed has a domestic application of the method been possible. The tape recorder is arranged to switch on at preselected times, usually about an hour after normal sleeping time and about an hour before normal waking. Special time switches are used. For repetitive work of this nature, the endless cassette is an advantage, with automatic rewind or tape direction reversal.

A Sleep-Learning Association has been formed to investigate the technique and to promote and encourage what is regarded as an educational aid.

SOUND.—The auditory sensation at the ear, caused by particle displacement (pressure) or particle velocity when the air is set in motion. As the ear behaves in a non-linear fashion, it is necessary to measure differences in sound level logarithmically; the decibel, 1/10th of a Bel, is used for this purpose. This is an expression of the ratio of one power to another, electrically, and acoustically it is used as a statement of relative sound pressures. Thus 0 dB equals a sound pressure of 0.0002 dynes per centimetre².

Using this reference level, the unit of absolute sound measurement, loudness, is the Phon, which at 1,000 cps is the same as the decibel.

Loudness depends on the frequency of the sound; whereas a sound at 1,000 cps of 60 dB relative to the reference given



A composite diagram showing the range of human hearing, from the lower to the upper limits. At both the extreme limits "hearing" becomes "feeling." The shaded portions show the comparatively small range of intensity and frequency covered by both speech and music compared with the capability of the human ear. Heavier dotted lines show the "equal loudness" contours, which demonstrate the difference in sound pressure needed to give an equal subjective response at the ear at different frequencies. All points along each line are of equal loudness

above will produce a certain aural sensation, a much greater loudness level, about 80 dB, will be needed at 50 cps to produce the same subjective effect. But both sounds would be stated to have a "loudness" of 60 phons.

A chart of equal-loudness contours, based on average hearing, is necessary to understand the phenomenon of changing aural sensation with frequency and sound pressure.

Human hearing deteriorates with age, the higher frequencies suffering most. The lowest sound an average ear will distinguish will be around 30 cps, below which we tend to "feel" the vibrations rather than "hear" them, in the pure sense. At the upper limit, depending on age and health a frequency of 15,000 cps would be normal, with younger persons and those with acute hearing able to distinguish frequencies up to about 18,000 cps.

SPEED.—Tape transport speed is a vital standard, necessary for the replaying of pre-recorded tapes without a change in pitch. Replayng at a slower speed would lower the pitch of the musical tones and replayng at a faster speed would raise them, the amount depending on the speed difference. Twice the speed of tape travel raises the tones one octave. Regularity of speed of tape travel is necessary for faithful reproduction. (See wow and flutter.)

Tape speed has evolved from the original standard used by the German Magnetophone, the forerunner of the modern tape recorder, whose rate of tape travel was

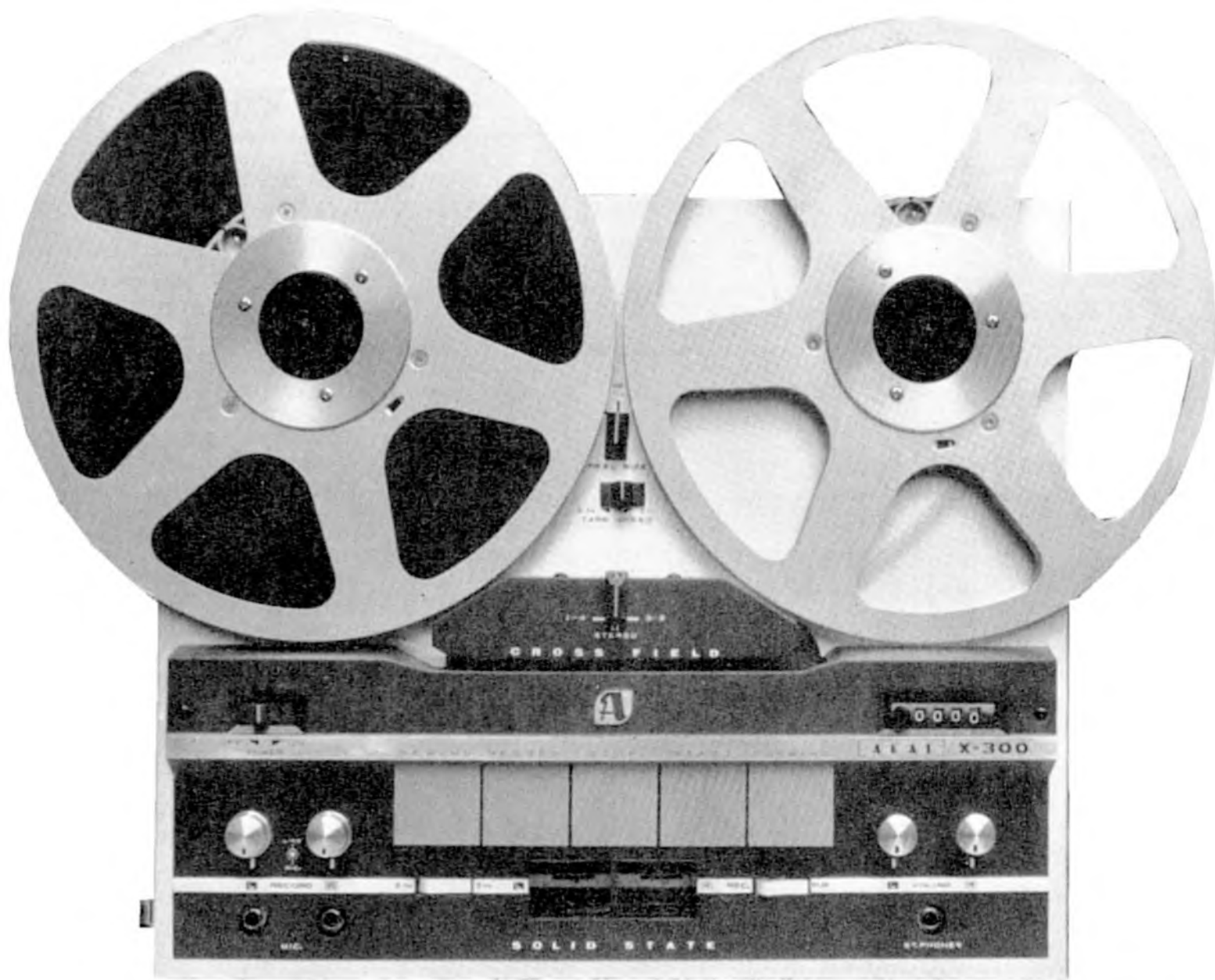
76 centimetres per second. This is about 30 ips, and the latter figure was established by a number of makers who contributed to the advances in the technique just after World War II. (The speed of the original wire recorder, the **Telegraphone** of Vlademar Poulsen, was 7 feet per second!)

Improvements in mechanical and electrical materials and methods have made slower tape speeds possible with no loss of quality. This enables more tape to be spooled, and gives a longer playing time. Speeds, however, have been established as sub-multiples of the original 30 ips, and are now standardised at 15, 7½, 3½, 1½ and 15/16 ips. One or two non-standard speeds are now being employed for cassette machines, 2 ips being the standard speed for many of these later entries to the field.

SPLICING.—Method of joining cut tape. Joint may be a straight butt or a diagonal cut and techniques include overlap of tape, with cement binding, use of non-adhesive tape with cement or a backing of adhesive tape.

SPLICING TAPE.—A special, pressure sensitive non-magnetic tape used for splicing magnetic tape. Its "hard" adhesive will not ooze and consequently will not gum up the recording head, or cause adjacent layers of tape on the reel to stick together. (Cellulose tape should never be used.) Can be obtained in a number of colours and used as a form of marker.

To be continued



**How does a 10½" reel
playing at 3¾ ips giving
18,000 cps and
20 watts per channel,
yet costing only
190 gns sound to you?**

**Mighty like the Akai
X300 with our
unique Crossfield Head**

The Akai X 300 is a 4 track stereo/mono studio-type tape recorder. It has 4 heads – erase, record, playback/monitor, and Crossfield; and 3 motors – one hysteresis synchronous direct drive capstan, two torque for fast forward and rewind. It has two speeds – 3¾ ips which will give you 30 to 18,000 cps ± 3db; and 7½ ips which will give you 30 to 24,000 cps ± 3 db.

The X 300 also has Akai's unique Crossfield Head. On conventional recording heads the bias current tends to erase the higher frequencies. On the Akai Crossfield however the bias current is fed into a separate head opposite the recording head, in such a way that it can't interfere with the higher frequencies. This makes possible true high fidelity recording at much slower tape speeds than normal.

Add to these features – piano key controls, tape cleaner, sound over sound, 10½" reel space, automatic stop and shut off, 4 digit index counter with reset button, vertical or horizontal operation, biased to receive FM Multiplex stereo broadcasts – and we hope you'll agree that the Akai X 300 gives you quite a lot of equipment for 190 gns. But if you'd like the detailed specification send the coupon.

AKAI



(A Company within The Rank Organisation)

To Pullin Photographic Limited, Dept. TRM 11,
11 Aintree Road, Perivale, Middlesex.
Please send me details of the Akai X 300.

Name _____

Address _____

99

Emitape 99—the long play tape formulated for 4-track recorders

Emitape 99 has been created by E.M.I., the original and largest British manufacturers of magnetic recording tape, in co-operation with I.C.I. who have produced a special 'Melinex' film base material for this new production.

Emitape 99 has greater strength—perfect tracking at all speeds—and outstanding hi-fi performance has been achieved by the most up-to-date coating techniques.

Three other high quality grades are in the Emitape range:

Standard Play 88 for use at professional tape speeds; **Double Play 100** for more recording time; **Triple Play 300** for maximum playing time on battery portables.

Emitape is supplied in a free transparent two-piece library case originally designed for computer tapes. It gives compact dust-free storage and easy indexing.

Emitape is used nine times out of ten by the B.B.C. All the best dealers are Emitape stockists.



EMITAPE

THE MOST ADVANCED MAGNETIC RECORDING TAPE IN THE WORLD



AN E.M.I. GROUP PRODUCT
E.M.I. TAPE LIMITED,
HAYES, MIDDLESEX

CROSS

TALK

By Audios

ONE of the snags of writing a gossip column is not the problem of what to put in, but rather the decision of what to leave out. Never before has there been so much activity in the world of recording. We could talk at some length about the recommendations of the Committee for the Mechanical Recording of Court Proceedings. Our great legal brains have at last acknowledged the existence of the tape recorder, and it is now recommended for use as an official piece of court equipment. By recording the proceedings and then typing back from the tape, a transcript will be available more cheaply, more readily, and possibly more accurately than by the employment of shorthand writers.

Although interesting, such an item of news is scarcely calculated to send our readers into transports of delight, though the shorthand writers may well be cast into the depths of despair. Progress usually breeds contention as is revealed in a recent report in the *Daily Mail*. Under the title "What they have done in Glenrothes for the Convenience of the Public," we learn that a £120 tape recorder has been installed in a new public lavatory in the middle of this Fifeshire town. It is said that the town's development corporation feels that the music will "counteract the silence and emptiness usually present and gives some life and cheer" to the place. Provision of the tape recorder was said to be recognised as desirable in a building of that nature. The down-to-earth Scots councillors are not going to take this suggestion lying down. One of them is quoted as saying that he had heard of music while you work but this idea was ludicrous, deplorable and daft.

So the argument will doubtless rage with all the passion and intensity of a French film. My thanks to Doris Tassell of Totnes, Devon, who sent me the cutting. It really did brighten what might otherwise have been a rather dull day.

IT'S surprising what does come floating into the office. I have a letter here from a Mr. A. C. Cleve-Sculthorpe who complains that he has in his possession a three-inch tape from a Mr. Brian Holden of Glasgow, and can't return it to him. Apparently Mr. Holden has moved. So if you read this

Mr. Holden and get in touch with us, we will put you in touch with one missing three-inch tape.

HAVE you ever read of a success story and wished it could have been about you? The President of the Sony Corporation of Japan was telling me the other day that his Company was founded twenty years ago on a capital of one hundred and eighty pounds sterling. Today its annual sales total thirty-six millions and its employees number six thousand. I suppose we should consider it a tribute to the potential value of the British market that such an influential person should find it necessary to travel six thousand miles to visit this tight little island. But where is our native ingenuity, inventiveness, and business acumen? Did you have a couple of hundred pounds to spare twenty years ago? If you did and you've still got that two hundred in the bank the moral is obvious. But then it was all said so many years ago in the parable of the talents.

We've been talking quite a lot about value for money recently. Whatever the economic condition of the country the man in the street is more concerned with getting good value for the money he spends than anything else. To get value for money we need well-designed and well-manufactured equipment handled by dealers who understand what they are selling and who are prepared to honour their obligations to their customers. The greater the range of equipment and its associated accessories that becomes available the more complex is the dealer's job. We have now reached the stage where one firm (Nu-Sound Tape Recording Centres) has set up three specialist sales organisations each dealing comprehensively with one make of equipment. The advantage of this method is to give the customer, you or I, the best possible advice and specialist service. This arrangement is a very honest endeavour to provide that "something extra" for the customer and as such is to be applauded.

THERE'S something very intriguing about a secret. This particular secret was of some dimensions and uncertain shape, shrouded in heavy covers. The covers were not removed—I did not see beneath them. This—object—was in the home of Mr. Leslie Watts of Jordan-Watts Ltd., loudspeaker manufacturers. From beneath the covers came some of the most beautiful sounds I have heard. What is it? I've just told you it's a secret! Obviously it's a speaker, and in fact it's a single-unit stereophonic speaker, but more than that I just don't know. But I do know what it sounds like and I do know that when it's off the secret

list I shall have full information which I shall only be too pleased to pass on to you. In the meantime I have the memory of some of the best reproduced sound I have heard.

I am always suspicious of the sort of demonstrations we hear at the Audio Fair. To demonstrate his prototype speaker Mr. Watts used a medium quality gramophone transcription unit coupled to a medium quality amplifier. On the turntable he placed one of his children's discs—"Winnie the Pooh" I think it was—and let the results speak for themselves. Speak for themselves they certainly did.

WE'VE all read about the way in which Astronauts are fitted with instruments to record their various physical conditions, such as heartbeat, body temperature, etc. You might be interested to know that a similar method is being used at Guys Hospital to record patients' cardiac conditions. Devices are fixed to the body and signals, fed to amplifiers, are recorded on magnetic tape using a multi-channel tape recorder. The tapes can be stored so the signal can be converted into visual form as a wavy line on squared paper.

Another well known use of tape in the service of humanity is in the "Black Box" used as part of the safety system in aircraft. Until the news came drifting into the office the other day I was unaware of the fact that civil aircraft are compelled by the British Ministry of Aviation to carry approved crash proof flight recorders. The words "crash proof" are interesting. We always tend to regard our recording equipment as delicate. Aircraft recorders have to stand the most exacting tests. Amongst those listed are a crashing force of five thousand pounds. Another, the "Javelin" consists of a sharply pointed, five hundred pound, steel bar being dropped from a height of ten feet to give an estimated one million seven hundred and fifty thousand pounds per square inch impact force. As if this wasn't enough the container is then heated in an open fire at a temperature of 1,100 degrees centigrade for 30 minutes and later is immersed in salt water.

This equipment must be of a different breed to the recorders that I use at home, although I must admit that one accidentally blew over in a gale of wind and suffered no damage. But that's child's play compared to the flight recorders.

ANOTHER prototype I have been looking at recently is a fifty watt bass speaker unit. Testing the unit has its own peculiar difficulties. At present it can't be used because the neighbours complain. Not of the noise but the vibration. It's smashed every piece of crockery in their cupboard. Funny what a jaundiced view some people take of progress and research.

MAGNETIC-TRL-90-TAPE

Brilliant new range of fine quality Recording Tapes made for us by famous British Manufacturer to full specification, complete with leaders, trailers and stop foils.

FULLY GUARANTEED—ABSOLUTELY UNBEATABLE VALUE

Triple Play (Polyester)		Double Play (Polyester)		Long Play (P.V.C.)	
3in.	600ft. 12/9	3in.	300ft. 5/9	3in.	225ft. 4/3
4in.	900ft. 17/6	4in.	600ft. 10/9	4in.	450ft. 7/6
5in.	1,800ft. 23/9	5in.	1,200ft. 15/9	5in.	900ft. 11/6
5½in.	2,400ft. 29/9	5½in.	1,800ft. 19/9	5½in.	1,200ft. 13/9
7in.	3,600ft. 39/9	7in.	2,400ft. 23/9	7in.	1,800ft. 18/6

SPECIAL ECONOMY PACKS—STANDARD QUALITY P.V.C. (no Leaders, etc.)

Long Play		Double Play	
3in.	225ft. 4 for 9/9	5½in.	1,200ft. 2 for 21/-
5in.	900ft. 2 for 15/9	7in.	1,800ft. 2 for 26/-
		5½in.	1,800ft. 2 for 34/-
		7in.	2,400ft. 2 for 42/-

Please add 1/6 per order postage and packing.

NASH HOUSE ELECTRONICS

NASH HOUSE, NEW STREET, WORCESTER

Tel.: 26316

from page 396

must at once be confessed that no attempt was made to produce a "programme" in the true sense of the word as there was insufficient time. Nevertheless, with some trepidation we proceeded to attempt to join the sequences together by cutting out the blanks to give continuity.

To our surprise we very quickly became adept at cutting out sections of tape and rejoining at the right places. All that was needed was a forty-five degree cut across the face of the tape and a conventional splice as in standard audio practice. The mechanism is so arranged as to permit the head to revolve whilst the tape is stationary, thus giving a "still" picture on the screen, and it is in this way that the tape can be marked at the correct spot for editing. Care must be exercised not to permit the head to revolve for more than a second or two against the stationary tape—longer periods would produce excessive wear in the oxide coating.

After a couple of attempts we were getting as near perfect splices as one could wish to see. As the head passed the joint on playback there was just the tiniest trace of a horizontal hold flash on the screen. We did feel this to be one of the most significant results achieved in our testing since it proved that this equipment may be used by the amateur enthusiast to produce real television feature programmes.

The Sony Video Recorder utilises a rotating head assembly in conjunction with $\frac{1}{2}$ -inch tape at the conventional tape recording speed of $7\frac{1}{2}$ inches per second. The rotating assembly contains two heads which revolve at a controlled speed of 25 rps. One head is used for recording and picks up every other field, or scan line. For play back both heads are used, the second head re-scanning the same field as the first. This produces the appearance on the screen of a completely interlaced 405 line picture. As with a cine projector where each "frame" is projected twice to minimise flicker, so this Sony system provides a smooth, even picture. The use of alternate-field recording and repeat field playback makes it possible to run the tape at half the speed that would be necessary if both heads were recording.

In a normal tape recorder the signal is recorded in a straight line, which moves past the stationary head at a few inches per second. Professional Video Recorders—as used by the various TV companies utilise "transverse scan," which is a small head revolving almost vertically across the tape at a fantastic speed, calling for refinements which result in this type of equipment costing many thousands of pounds. The Sony Helical Scan is a compromise between these two systems. The tape passes over the rotating heads in a spiral, thus the recordings are made virtually diagonally across the tape enabling the maximum amount of information to be recorded with the minimum usage of tape. Using helical scan permits the Synchronising Signal, Video signal and Audio signal to be recorded on one $\frac{1}{2}$ -inch tape at an extremely moderate cost.

406

from page 399

and violent breath effects when used at close range to the voice.

It is usual to pay up to £10 or more for such a simple instrument. Studio moving-coil microphones having an excellent frequency response and capable of quality work of the highest order naturally cost more. A glance around a professional studio would reveal several microphones, both cardioid and omni-directional, in the £30 price bracket and such instruments would satisfy even the most discriminating ear. One manufacturer even offers an omni-directional instrument with a sensibly flat response to 20,000 cycles per second. This gives superb quality which until recently could only be obtained by using a microphone costing three or four times as much. One can, however, still pay up to about £100 for very robust and ultra-directional studio moving-coil microphones.

Ribbon microphones operate through the action of what is literally a very fine metallic ribbon suspended in a system of magnets. Because the ribbon is fragile the microphone must be protected carefully against shock or wind. This kind of microphone is therefore reserved for use under controlled, indoor conditions. Only specially modified versions should be used outdoors.

The directional pattern is figure-of-eight. This is easily appreciated if one considers the suspended ribbon. The front and rear faces of the microphone are the front and back of the ribbon itself; the side faces are the two edges of the ribbon. Ribbon microphones are liable to distort explosive consonants and to register exaggerated breath noises. They will also accentuate the lower frequencies giving a "boomy" quality to a voice if it should approach too closely. Their disadvantages are more than compensated by their ability to give us really good quality at reasonable cost.

There are a large number of excellent ribbons available at around £10 or £12, all having a frequency response of up to about fifteen thousand cycles per second and so giving very acceptable quality on both music and speech. Ribbon microphones should never be hand-held, and should never, never be used for any kind of close talking or close singing technique. Close approach to the microphone requires the use of either the moving coil or the condenser types.

Condenser microphones are indeed the aristocrats of the microphone world. Quality is outstanding as tones of up to twenty thousand cycles are reproduced. There are complications however. The principle of operation of the condenser microphone involves the use of a polarising voltage and so the microphone must either be plugged into the mains or must operate from a specially designed battery pack. Additionally it is provided with its own electronic pre-amplifier and so its greatest disadvantage, one of cost, is likely to be considerable. At one time all microphones of this type cost £100 or more but today, thanks to improved design, a good condenser microphone can be purchased for as little as about £70. In this brief description of the different kinds of microphones we have travelled a long way from the simple crystal costing as many shillings.

HOW TO POSITION A MICROPHONE

Probably the reader already owns a microphone. If so, check on its kind and its directional pattern in the manner described. If it should be an omni-directional microphone it can now be used in the light of that established fact. Because it is omni-directional it will not only pick up the sound of your voice as you are seated in front of it, but it will also pick up the sound of your voice as it is reflected from the walls of the room in which you are seated. In addition it will also pick up traffic sounds from the road and any other stray noise that might chance to be around. The worst place to position such a microphone would be in the corner of a room where sound reflections are likely to be at their greatest. Probably as bad would be adjacent to a window above a noisy road. Sound reflections and the entry of unwanted noises will at once be lessened if curtains are drawn across windows; the heavier the curtain the better. Sound reflections can be lessened by placing the microphone in front of some soft furnishing fabric such as a settee or easy chair.

The writer is only too familiar with average domestic conditions; he not only lives in them himself but he has discussed them with large numbers of amateur enthusiasts over a period of many years. In a domestic living room a suitable niche, such as on the sideboard, is found for the tape recorder. There it is kept and there it remains. The microphone, usually on about six or eight feet of lead, is used immediately adjacent to the machine regardless of whether or not this is the correct position. This is a completely wrong method of operation.

If you are working on a short mic. lead, then the maximum distance between microphone and machine is fixed. The machine itself, however, is not fixed because you may use as long or as short a mains cable between the wall socket and the machine as you might wish. In every room there are one or two positions for the microphone that will give very much better results acoustically than anywhere else. These positions should be established by patiently taking short recordings at different points. When the optimum spot is found in relation to the major items of furniture then that is the position to use even if it means temporarily removing the recorder from its home on the sideboard when in use.

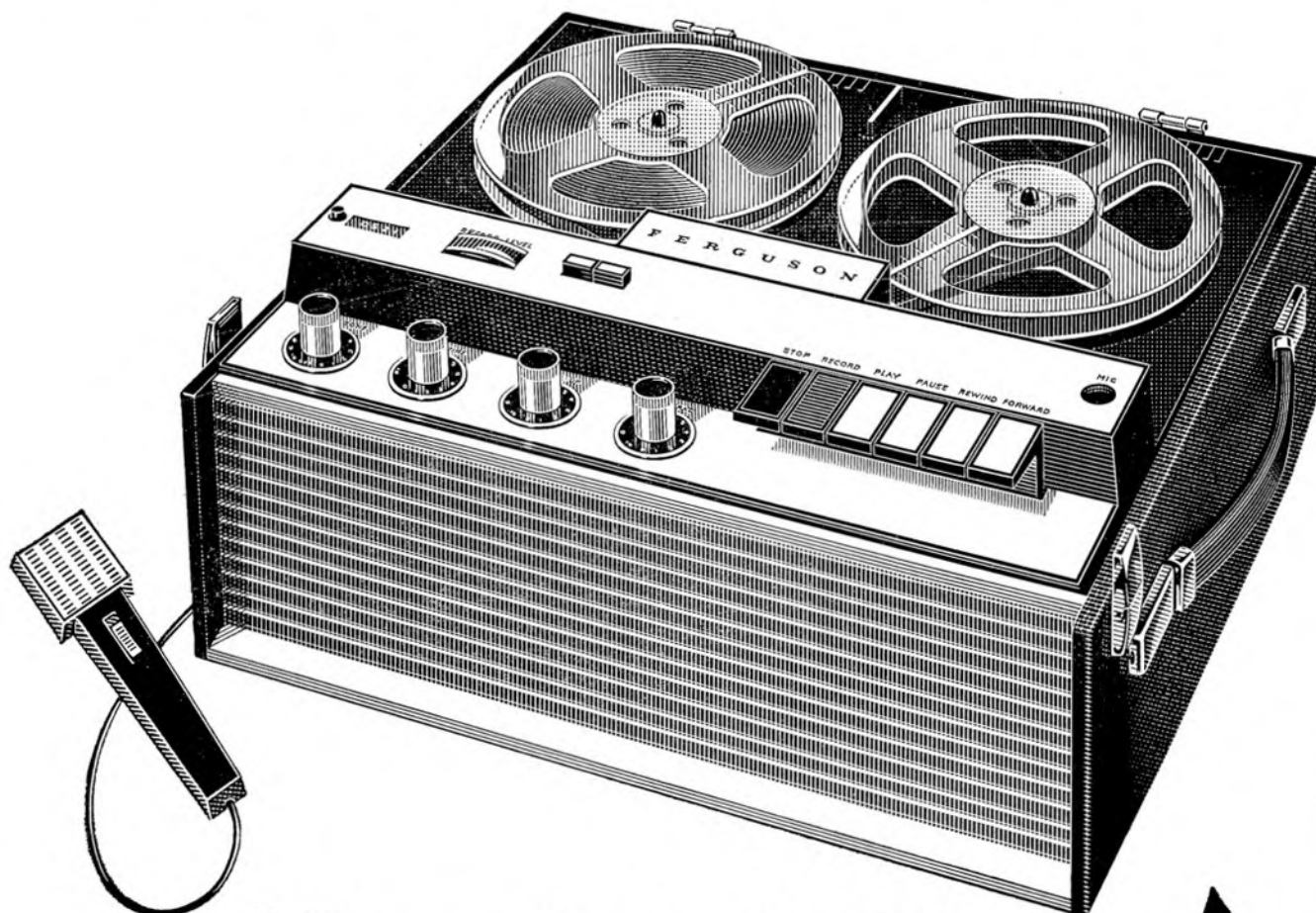
MORE EXPERIMENTS

We shall have a great deal more to say about microphones and microphone positioning. During the next four weeks do try the experiments that have been mentioned. But to make the points quite clear I would like you to try recording under two extremely different conditions. The most resonant room in the house is usually the bathroom because it is small and often tiled. Try taking a short voice recording with the microphone in the bathroom (but be careful to keep your mains lead outside).

Now try the other extreme by taking the microphone to bed. Your family may think you are crazy—ignore them. Bunch up the bedding to form a tent and crawl underneath with the microphone. This is the easiest way of achieving a dead acoustic.

(Please turn to page 411)

Look at all the features on Ferguson's new 'professional' tape recorder—



...and it costs only 44gns

**GREAT
ENTERTAINMENT
VALUE**

Just look at the big-price features on this new low-cost Ferguson Model 3214 tape-recorder: three speeds, four tracks, 7" self-threading spools and up to 17 hours playing time per reel of double-play tape (8½ hours on the tape supplied). This is the recorder with the real professional touch: mixing facilities, two-way tape inching, double-track replay for special effects pause key, remote control microphone, and interlocking keys to prevent accidental

erasure. The output is 3 watts feeding into a 7" x 4" speaker with a frequency response of 40 c/s to 18 Kc/s at 7½ i.p.s.; 40 c/s to 14 Kc/s at 3½ i.p.s.; and 40 c/s to 7 Kc/s at 1⅞ i.p.s. Leathercloth covered wood cabinet with silver-trim panels, Beautifully designed and beautifully finished. With 1200 ft of free long-play tape, remote control microphone, and connecting leads.

Great, great value. Great entertainment, too.

FREE! Post this coupon now for full details of the Ferguson Tape Recorder range.

TO: FERGUSON DIVISION
Thorn House·Upper Saint Martin's Lane·London, WC2

NAME _____

ADDRESS _____

TM

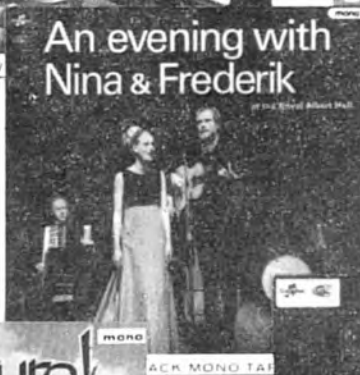
FERGUSON MODEL 3214



ONE OF THE RANGE OF 26 HOME ENTERTAINMENT PRODUCTS MADE BY FERGUSON: TELEVISION · RADIOGRAMS · RECORD PLAYERS · TAPE RECORDERS · TRANSISTOR RADIOS
See the full range at your local dealers or send for free colour leaflet. To: Ferguson Division · Thorn House · Upper Saint Martin's Lane · London, W.C.2.

the big sounds of '66 on tape from EMI

**3 3/4 I.P.S.
TAPE RECORDS
FROM YOUR
RECORD DEALER
NOW**



Sound Venture
Georgie Fame
Columbia TA SX6076

An Evening at The Albert Hall
with Nina & Frederik
Columbia TA SX6077

Big Ben Strikes Again—
Big Ben Banjo Band
Columbia TA SX6089

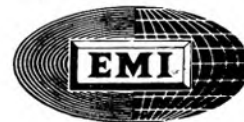
Sousa The Great—
Grand Massed Bands
Columbia TA SX6004

Carnival—
Joe Loss
Columbia TA SX6090

Adventure—
Ron Goodwin
Columbia TA SX6091

This is The Life—
Matt Monro
Capitol TA T2540

The Vintage Years—
Nat King Cole
Capitol TA T2529



THE GREATEST RECORDING ORGANISATION IN THE WORLD

E.M.I. RECORDS (THE GRAMOPHONE CO. LTD.) E.M.I. HOUSE, 20 MANCHESTER SQUARE, LONDON W.1.

TAPE RECORDER COVERS



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

Grundig TK.1	49/6
TK.5	55/-
TK.6	67/6
TK.8	63/-
TK.14, 18 & 23	59/6
TK.14L, 17L, 18L	
TK.400 & 23L	67/6
TK.20	52/6
TK.24	55/-
TK.25	55/-
TK.30	60/-
TK.35	63/-
TK.40 & 41	66/-
TK.46	82/-
TK.55	63/-
TK.60	75/-*
TK.830/3D	63/-*
Cub	35/-
Telefunken 85	65/-
75/15 & 76K	55/-
95 & 96	69/6
Philips EL3538	63/-
EL3542	63/-
EL3536	70/-

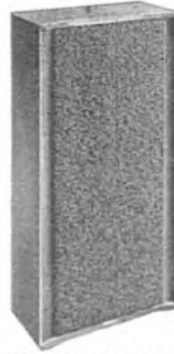
Philips 3534	87/-
3548	79/6
3549	79/6
3585	57/-
3514	46/-
EL3515	57/6
EL3541/15	57/6
3541H	72/-
Cossor 1602	57/6
1601	43/-
1604	79/-
1605	84/-
Stella ST455	63/-
ST454	57/6
ST458	79/-
ST459	84/-
Saba 2305	79/6
Elizabethan LZ29	75/-
FT.1	66/-
Brenell Mk. 5	77/-
3 star	69/-
Robuk RK.3 & RK.4	67/6
Sony 521	90/-
Ferroglyph	80/-
Revox F model	84/-
Optacord 412, 414 & 416	63/-
Truvox 92 & 94	99/-
Tandberg 72, 72b, 74, 74b, 62, 62b, 64, 64b	
(hard case)	£7/1/8
Soft case	£5/12/6
92 (hard case)	£7/1/8

A. BROWN & SONS LTD.

24-28, GEORGE STREET, HULL Tel.: 25413, 25412

SIMPLY PERFECT...

ONLY



High Fidelity Loudspeakers so smoothly span more than the entire audio frequency band with a single uncomplicated (albeit very ingenious) unit.

There's no distortion or loss in JORDAN-WATTS loudspeakers through tweeters, cross-overs, woofers, brilliance controls, etc.

PRICE £24-10-0.

JUNO

If you seek sound perfection with absolutely no compromise.

JORDAN-WATTS offer you the truth, the whole truth, and nothing but the truth, in the reproduction of your signal.

3-5 ohms OR 7½-16 ohms models. Capacity 12 watts per module.

Beautiful enclosures, too. Or available in chassis form for the constructor to make the simple enclosures from our drawings.

PRICE £10-10-0.

Please ask your dealer for a demonstration or send for leaflet of the range of systems available.



Distributors:

Boosey & Hawkes (Sales) Ltd.
Deansbrook Road,
Edgware, Middlesex.

Manufacturers:

Jordan-Watts Limited
Benlow Works,
Silverdale Road, Hayes, Middlesex.

Jordan-Watts Loudspeakers — The Voice of High Fidelity

THE RECORDER CO.

for best machines on advantageous terms

	Deposit £ s. d.	12 Monthly Payments £ s. d.	Cash Price Gns.
4-TRACK STEREO/MONO			
Sony TC200	25 4 0	4 4 0	72
Akai 1700	27 13 0	4 12 2	79
Philips EL3534	32 4 0	5 7 4	92
Tandberg 74	32 11 0	5 8 6	93
Tandberg Series 12	36 15 0	6 2 6	105
Sony TC500A	36 15 0	6 2 6	105
Beocord 2000K	47 5 0	7 17 6	135
Beocord 2000T DeLuxe	48 13 0	8 2 2	139
Akai M8	51 2 0	8 10 4	146
Akai X300	66 10 0	11 1 8	190
MAINS 2-TRACK			
Ferguson 3220	8 15 0	1 9 2	25
Fidelity Playmatic 2	9 16 0	1 12 8	28
Grundig TK120	10 6 6	1 14 5	29½
Grundig TK14L	12 5 0	2 10 0	35
Truvox 42	16 9 0	2 14 0	47
Tandberg 823	18 18 0	3 0 0	54
Tandberg 92	24 3 0	4 0 6	69
Brenell 5/3	25 18 0	4 6 4	74
Brenell 5/3 (Meter)	27 13 0	4 12 2	79
Truvox R102	31 3 0	5 3 10	89
Brenell 5/3 'M'	32 11 0	5 8 6	93
Ferroglyph 631	33 5 0	5 10 10	95

MAIN 4-TRACK

	Deposit £ s. d.	12 Monthly Payments £ s. d.	Cash Price Gns.
Fidelity Playmaster	8 15 0	1 9 2	25
Fidelity Playmatic 4	10 1/0	1 16 2	31
Ferguson 3218	11 18 0	1 17 8	34
Ferguson 3222	12 5 0	2 0 10	35
Philips EL3558	14 14 0	2 9 0	42
Grundig TK17L	15 1 0	2 10 2	43
Truvox 44	16 9 0	2 14 10	47
Grundig TK400	16 9 0	2 14 10	47
Wyndors Vanguard	20 13 0	3 8 10	59
Philips EL3556	21 14 0	3 12 4	62
Truvox R104	31 3 0	5 3 10	89



BATTERY OPERATED

	Deposit £ s. d.	12 Monthly Payments £ s. d.	Cash Price Gns.
Philips EL3301	9 2 0	1 10 4	26
Philips EL3586	9 2 0	1 10 4	26
Sony TC900 Bat/Mns	11 4 0	1 17 4	32
Sanyo MR110 Bat/Mns	12 12 0	2 2 0	36
Grundig C100	15 15 0	2 12 6	45
Telefunken 300	17 3 0	2 17 2	49
Telefunken 301 4-T	18 18 0	3 3 0	54
Akai X-4 Stereo	34 13 0	5 15 6	99
Uher 4000L	36 1 0	6 0 2	103

	Deposit £ s. d.	12 Monthly Payments £ s. d.	Cash Price Gns.
STEREO TAPE UNITS			
Sony TC250A	20 13 0	3 8 10	59
Truvox PD104	36 15 0	6 2 6	105
Beocord 1500	36 15 0	6 2 6	105
Ferroglyph 634	46 4 0	7 14 0	132

Open Saturday 6 p.m.—Friday 6.30 p.m.
H.P. also over 18 and 24 months

If unable to call, write for free brochure, or send deposit now for quick delivery.

FREE DELIVERY
PART EXCHANGE

THE RECORDER CO.

NEW B. & O. MODELS

Beocord 2000T De Luxe

Built-in 4-channel mixer. Twin faders for both mono and stereo offering balancing facilities in both channels during record and playback. Multi-playback. Syncro playback for slide projection. Echo effects. Two detachable speakers. Electronic overload protection circuit.

139 gns.

Beocord 2000K

Table model as above less speakers.

135 gns.

Beomaster 900K Table Radio

Solid state stereo amplifier with built-in Decoder and twin speakers for Multiplex stereo broadcasts. 12 watt stereo output L.W., M.W. and F.M.
Teak or Rosewood.

72½ gns.

Special Offer

AKAI 44S 4-Track Stereo/Mono

3 Speeds—7½, 3½, 1½ ★ 6 Watts Stereo output ★ 2 VU Meters. Horizontal or Vertical use ★ Self-contained Speaker ★ 7" Tape capacity ★ Power supply 100-240 v. A.C. 50/60 cycles ★ Auto stop ★ Exclusive precision micro gap head for high fidelity reproduction.

BRAND NEW, supplied complete with demonstration tape, full instructions and maker's 12 months' guarantee.

Listed 82 GNS OUR PRICE 66 GNS

Deposit £7.14 and 8 monthly instalments of £7.14

(DEPT. T), 188, WEST END LANE,
WEST HAMPSTEAD, LONDON, N.W.6
Telephone: SW1 4977

TEMPOTAPE

PRE-RECORDED TAPE



MONO
3 3/4 I.P.S.
1/2 TRACK 21'-

STEREO
3 3/4 I.P.S.
2 TRACK 30'-

Professional tape recordings at less than blank tape prices. Full length 5/600 feet L.P. Polyester tape.

NOTE THESE EXCITING TITLES:

TCHAIKOVSKY'S PIANO CONCERTO

THE KING AND I

SOUTH PACIFIC

ROMEO AND JULIET OVERTURE

TCHAIKOVSKY'S 1812 OVERTURE

SOUND OF MUSIC

MY FAIR LADY

Write for full list or available from your dealer

PORGY AND BESS

WEST SIDE STORY

THE MUSIC OF ROGERS, HART & HAMMERSTEIN

THE MUSIC OF HENRY MANCINI

SCHEHERAZADE

BEETHOVEN 5th SYMPHONY

SPARKLE OF STRAUSS WALTZES

TEMPOTAPE LIMITED

BRIDGE WORKS · WALLACE ROAD · LONDON N1 · CANonbury 8641

metrosound

TAPE RECORDER ACCESSORIES

● Tape Accessory Set containing Klentazape, Metro-Splicer, Metro-Brush, 30/- each.

● Klentazape Price per Kit 13 6. Refill fluids 4/- per bottle. Replacement tapes 6/-.

● Metro-Splicer Splicer Kit complete with Film Emulsion Scraper and Spare Cutting Unit 15-. Spare Scrapers 1- each. Spare Cutting Units 2 6 each.

● Metro-Tabs 3/11 per set complete with index.

● Metro-Brush 2 6 each.

● Metro-Stop 17 6 per set.

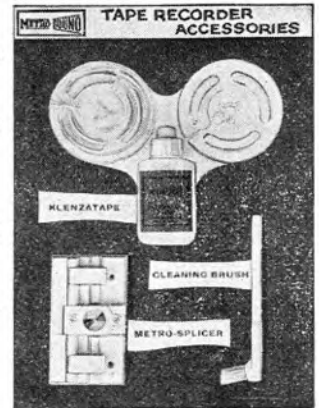
● Metro-Strobe 12 6.

● Leader Tapes (5 colours) 4/6 each.

● Metro-Splicing Block MST17 9-.

● Tape Recorder Mechanical Maintenance Kit 36-.

Available from dealers everywhere.



metrosound manufacturing co. ltd.



FOR PERFECTION IN SOUND

LOEWE OPTA

INTRODUCE THE **NEW**

OPTACORD 450 BATTERY/MAINS

CASSETTE LOADING TAPE RECORDER for 39 GNS.

OPTACORD 450 THE UNIVERSAL TAPE RECORDER FOR BATTERY/MAINS OPERATION (Power-pack incorporated)

- New compact-magazine-system bans tape threading (Philips type).
- Unlimited reproduction possibilities with self-made recordings or commercially available pre-recorded tapes.
- Ready for recordings per microphone supplied with the set, as well as from the radio-receiver, record player or any other tape recorder.

Other features include:

Further to operation on batteries (5 monocells 1.5v each) or on mains (110/220 v a.c.) connection to car battery (6 or 12 V) also possible. Playing time with compact-magazine C 60 = 2 x 30 mins. with compact magazine C 90 = 2 x 45 mins. Monitoring via built-in loudspeaker, external speaker or headphone: Frequency response 50-8000 c/s; Contrast = 40dB.

Write for illustrated leaflet and further details to:



HIGHGATE ACOUSTICS

71/3 Gt. Portland Street, London, W.1.
MUSEum 2901/5

OUR READERS WRITE

TAPE AND EDUCATION GARY CORNFORD COMMENTS

YOUR special investigation into "Tape in the Schools" (*August issue*) and the accompanying articles by Winifred Bayliss and Messrs. Hodgson and Ranger were really excellent and I do congratulate you on them. There is far too little creative use of tape recorders in our schools and I've yet to come across a school that does not have a machine of some sort or other. Thus there is no excuse other than that the teachers cannot be bothered or have never thought of the tape recorder as a means of making schoolwork interesting and creative.

I hope your articles will not only be read by the "converted" but will find their way into the hands of headmasters and teachers as yet "unconverted."

May I air just one criticism of Denis Gilbert's article? He stated that I "condemn this use of recording equipment (for C.S.E.) as inappropriate." It seems likely that Mr. Gilbert misunderstood me. I welcome the use of the tape recorder into the examination; what I condemn is the attitude that this is all the machine should be used for. It is after all a "recorder" and one aspect of its use is that it can faithfully record human speech. However, in many Secondary Schools the only time the pupils' speech will be recorded will be during the CSE English examination. He will probably never have the opportunity to use the machine creatively either by himself or with others.

As a side issue to this I think it worth mentioning that a large number of children nowadays have tape recorders of their own—some of them having very expensive models indeed. Many pupils are thus able to work a tape recorder but are not able to use it—their recording is limited to taping Radio London or some other "pop" station. The need to "teach tape" in schools is not only to ensure the full use of the school machine, but should also provide our affluent pupils with the ability to use their own machines properly.

GARY CORNFORD.

Southfields, London, N.W.8.

A REQUEST FROM JAPAN

YOUR name has been recommended by the tape club of Waseda University here in Tokyo, who inform me that you have a system enabling us to exchange views and opinions by recording our voice on tape.

I would be happy if you could introduce me to some friends who are interested in hearing from my country. I would like to hear what people in other countries think about the world situation today; of their cultures; and ways of life.

I have majored in English and American Literature at Tokyo University, and am now studying French. For this reason I would be happy to establish a tape exchange system in English. My full address is 3-240 Shinden-machi, Ishikawa-shi, Chiba-ken, Tokyo.

MISS MAKIKO IWAKAMI.

Tokyo, Japan.

WE ARE ALWAYS PLEASED
TO RECEIVE LETTERS FOR
PUBLICATION FROM READERS
— WRITE TO THE EDITOR
AND MARK YOUR LETTER
"FOR PUBLICATION"

THE CULTURAL SOCIETY OF THE DISABLED YOUR HELP IS NEEDED

FOLLOWING the report of a specially appointed *ad hoc* sub-committee, the Cultural Society of the Disabled is being completely reorganised. I have been given the job of reconstituting the Tape Reading Service.

Offers of help from individuals or clubs willing to do copying of tapes to enable the service to operate smoothly and quickly are welcome. It is hoped to start by reading from audio journals (we have readers available but would welcome volunteers who are good at it!) making eight to ten copies of each every month for distribution to members.

Those willing to help would be supplied with a five-inch master tape (recorded two-tracks at 3½ ips) and sufficient blank tapes to cover the needs. These would then be returned to a central address for distribution. A special label would be supplied so the volunteer(s) would be involved in no cost and would merely be giving up time to do the copying once a month. This service would be greatly appreciated. I look forward to hearing from enthusiasts willing to help blind and disabled people in this way.

ROBIN BARCLAY.

*64 Barrow Road,
Sreatham, London, S.W.16.*

RECORDING FROM RADIO OR TV

THE wording of reader Bassford's letter describing his difficulty in obtaining good recordings from radio and television (*May issue*), and the request for a "suitable pre-amplifier which would make the microphone more sensitive in input 2" rather makes me suspect that this reader has been trying to record radio by means of his microphone, and further that he has plugged the microphone into input 2 (radio input).

If this is indeed the case the apparent lack of sensitivity of the Reslo microphone is explained, as input 2 has not sufficient amplification for a microphone; it is intended for sources with a much higher output. Microphones should only be used through input 1, and the Ferrograph Manual explains in considerable detail the various methods of recording.

Trying to record radio by means of a microphone is a waste of time as room noises are added, and in addition the radio quality will never be of a very high standard. Better results would be obtained by connecting the external loudspeaker out-

put of the radio to input 2 on the recorder, and keeping the radio volume low, but for hi-fi recordings it is necessary to use what is known as the diode method of connection by taking the radio output from across the volume control, as mentioned in the Editorial reply.

If much recording is to be done, and first-class quality is required, it is best to follow the Editor's suggestion and use a separate tuner unit; some of these will also supply television sound and avoid the necessity of tampering with a TV set, as the latter procedure can be dangerous owing to the live chassis and high voltage encountered. The Editor rightly warns against any attempt to connect a TV direct to a tape recorder.

L. REID.

Belfast, Northern Ireland.

MANUFACTURERS ARROGANT?

I AM alarmed by the arrogance of manufacturers who introduce tape machines with non-standard tape widths and speeds. Formerly it was chiefly certain large American firms (RCA, 3M) which promoted cassette machines, but now it is the "Mr. Bigs" from the Continent.

Readers of *TAPE* know that any intelligent child can operate the normal standard open-reel tape recorder blindfolded. But with the advent of the cartridge-loaded machine even infants and the feeble-minded can join the party. Is this worth the price?

Such non-standard equipment will go far to halt tape exchanges among recording enthusiasts. Perhaps that is one of its purposes. But obviously the main goal is to make blank tape (in patented cassettes) and taped music much more costly. These factories think we don't spend enough on our favourite hobby!

It is not realistic to expect the tape journals to lead resistance against anarchy in tape machine design: Editors must maintain a neutral stance between advertiser and subscriber. But I am sure that each tape enthusiast will warn his friends against acquiring non-standard, non-compatible equipment.

J. L. BEST.

Brussels, Belgium.

TECHNIQUES CONTD.

from page 406

Take a short voice recording similar to the one in the bathroom but under these very cramped and uncomfortable conditions. If the bedroom and the bathroom recordings are now played back, one immediately after the other, you will have the two extremes of acoustic and the difference in sound quality will probably stagger you.

It is within these limits that we work and it is because of these great differences that our work is so absorbing. Next month we will consider the professional way of taking a simple voice recording and how this can be done on domestic equipment at home.

YOUR LOCAL DEALER

LONDON

NEW LAMPS FOR OLD?

For the Best Part Exchange
Phone or visit

GREENE & COOPER LTD.

211 KENTON RD., KENTON,
HARROW, Middx. WOR 8006

B. & O., FERROGRAPH, TRUVOX,
BRENNELL, AKAI, REVOX, QUAD, LEAK, etc.

Lee Electronics

THE TAPE RECORDER & HI-FI AUDIO SPECIALISTS
400, EDGWARE RD., LONDON, W.2 (PAD 5521)

London's leading Stockists of High-Fidelity
and Audio Equipment. Many bargains in
new and reconditioned equipment.

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



APPOINTED B. & O. AGENTS.

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

MAGNEGRAPH

1, Hanway Place, London, W.1.
Tel.: LANgham 2156

Masseys of Sound

West London's Hi-Fi Tape Recorder Specialist
—Demonstration Room with Comparator

APPOINTED FERROGRAPH DEALER

AT
CHISWICK, W.4

Accessories, All Kinds—Servicing—Pre-Recorded
Tapes Mono/Stereo
121-123 High Road—10 a.m.—7 p.m.

◀ TEL: CHI 2082 ▶

(not closed for lunch)

Tape records reviewed

A wonderful package of pleasure!

JAZZ



By Mike
J. Gale

THE ANATOMY OF IMPROVISATION.
Dizzy Gillespie and others. WRC
(TT 526), 3½ ips, 29s. 6d.

There is something here for everyone especially the serious collector of jazz. In a unique presentation, sections from this tape have been transcribed and form part of "The Book of Jazz" by Leonard Feather (Arthur Barker Ltd.) giving the purchaser of both a wonderful opportunity to increase his knowledge and appreciation of what is after all, the basis of jazz.

The variety of individual talents make it impossible to spotlight a particular performance and in addition, the nature of this album is such that the entirety must be the yardstick. Its span (1949-1956) is in itself, an interesting study but while there is so much here to debate, analyse and assess, it also provides a wonderful package of pleasure.

Rightly, the programmers have restricted the items to ten: *Jessica's Day*, *Bloomdido*, *Blues for the Oldest Profession*, *Trumpet Blues*, *Confab with Rab*, *Platinum Love*, *Hallucinations*, *Monogram*, *Blues in B flat* and *The Opener*.

Rightly because the whole programme is perfectly balanced and, like that once famous advertisement, there isn't too much and there isn't too little.

Strongly recommended.

WILD BILL DAVISON. Freddy Randall (tpt); George Chisholm (tbn); Lennie Felix (pno); Dave Markee (bs); Tony Allen (dms); Ronnie Gleaves (vbs) and Bruce Turner (alt, clt). WRC (TT 552) 3½ ips, mono, 29s. 6d.

William Davison, born in Ohio in January 1906, sampled his first recording session at the age of eighteen as a member of the Steinberg band. Three years later he moved to Chicago and played with a variety of bands until 1932 when, as a motorist, he was involved in an accident which took the life of his passenger, the great Frank Teschemacher.

Some rather vindictive stories circulated (the first thing he said after hearing of Teschemacher's death was alleged to be "Where the hell are we going to find a clarinet player as good as Frank for the band!") and he claims he suffered for over ten years—professionally—as a result of the accident (or alleged remarks?).

His career wandered from group to group and prior to working with Eddie Condon he served in the armed forces from 1943 to 1945. Davison spent ten years at Condon's club and during this period he made several visits to Europe where he often recorded.

This album, the result of a British tour, is typical of his well known method of forgetting subtlety and lashing savagely at a melody until it is transformed into a vehicle for his rasps and growls. His lack of complication is, within limits, refreshing but the support on this album is, to be polite, impotent.

One could say, I suppose, that its interest is restricted particularly with the competition around.

The set consists of *Royal Garden Blues*, *Memories of You*, *Hindustan*, *If I had You*, *All of Me*, *Wolverine Blues*, *Ghost of a Chance*, *Strutting with some Barbecue* and *Tin Roof Blues*.

Gusto and charm from Russ

POPULAR



By Don
Wedge

RUSS HOUR. Russ Conway with accompaniment by Geoff Love. Columbia (TA-33SX 6055), 3½ ips, mono, 35s.

There is no medley on this latest Russ Conway album, but nevertheless its a sing-along all the way. Conway has a winning way with refurbishing tunes that have already sold by the million, and presenting them freshly. But he never departs from the melody for an instant.

His choice here ranges from the corny *Red Roses For A Blue Lady* to the normally sophisticated *Lullaby Of Broadway*.

Conway, however, knows that the great big British public really isn't all that sophisticated, and he is happy to please them. He does so with gusto and charm.

SOUL AND INSPIRATION. The Righteous Brothers with orchestra conducted by Michael Patterson. Verve (TA-VLP 9131), 3½ ips, mono, 35s.

"Soul And Inspiration" is not only the title song of this LP but its entire theme. The Righteous Brothers (who are not related) are forceful soul singers.

They strive to create an emotional experience. Their media is a set of moving ballads, their mood one of melancholia.

In its way it is stirring. But don't expect to be very uplifted.

THE SONNY SIDE OF CHER. Cher with accompaniment directed by Harold Battiste, Jr. Liberty (TA-LBY 3072), 3½ ips, mono, 35s.

The colourful team of Sonny and Cher burst on Britain a year ago and threatened to be the biggest thing since sliced bread and the Beatles. They didn't quite maintain the promise but they have become an important part of today's pop scene.

This album features the female half of

the duo, and is produced by the male part, Sonny Bono.

Songs vary from Cher's own recent hit *Bang, Bang* to other contemporary successes like *Elusive Butterfly*, *Like A Rolling Stone* and *It's Not Unusual*. As such Cher suits them.

Unfortunately she is much out of her depth in Charles Aznavour's *A Young Girl* and the Edith Piaf success *Milord*, *Ol' Man River* and *Girl From Ipanema* grossly over-rate Cher's capabilities.

SPANISH EYES. Al Martino with orchestra conducted by Pete De Angelis. Capitol (TA-T 2435), 3½ ips, mono, 35s.

One of the big singing heart-throbs a decade ago, Al Martino has made a substantial comeback in the past year in America. His success has not been repeated in Britain to the same degree, but nevertheless he is finding renewed acceptance here.

This album is titled after his big American success of earlier in the year. The other songs on it are popular successes like *My Foolish Heart*, *Make The World Go Away* and *Forgive Me*.

Martino's high-tension balladeering hardly makes for relaxed listening however.

WHERE THE ACTION IS. The Ventures. Liberty (TA-LBY 1297), 3½ ips, mono, 35s.

The Ventures use their guitars in quite a different way. An American beat group which has surprisingly found even greater success in Japan than in its home country, the Ventures have made nothing like the same impact here. Perhaps it's because we are well served by the Shadows.

Most of the numbers on the album are in the vogue of today and written as such. There is a leavening of such standards as *Fever* and *A Taste Of Honey*.

PARIS SWINGS. Elmer Bernstein and the Swinging Bon Vivants. WRC (TT 516), 3½ ips, mono, 29s. 6d.

No lover of the French café bands—those accordions grate on me—I approached this record with reluctance.

But I was pleasantly surprised. I should have expected better of Elmer Bernstein, famous for his film scores from *The Man With The Golden Arm* onwards.

He takes all the hackneyed French standards—*Under Paris Skies*, *I Love Paris*, *La Vie En Rose* and so on, but gives them modern harmonies. The result is a combination of hip and the traditional. Compromises do not always work. This one does.

The tapes reviewed this month are issued by the following companies:
 "Capitol," "Columbia," "Liberty," "Verve,"
 E.M.I. Records Ltd., 20, Manchester Square,
 London, W.1.
 "W.R.C.": World Record Club, Box II, Park-
 bridge House, The Little Green, Richmond,
 Surrey.

LEDA TAPES have introduced a scheme to enable tape recording clubs to purchase quantities of Lafayette magnetic recording tape at trade prices. The scheme (minimum order £10) also includes a guarantee that the company will repurchase the tape at the price paid up to three months after an order has been placed if the society does not wish to retain it.

Interested clubs are invited to contact Leda Tapes for full details.

Leda Tapes, 12 Montague Road, Leytonstone, London, E.11.

NEW TRM SPECIALS!

TAPE RECORDING YEARBOOK, 1966 edition. Sole recorder annual.

7s. 6d. (USA \$1.25)

Lists available tape recorders, decks, mikes, etc. including specifications and prices; addresses of Clubs, Manufacturers, etc.

The Law and Your Tape Recorder by Andrew Phelan (Barrister). 3s. 6d. (USA \$0.75)

Interprets the law in UK for the tape recorder owner; what is free, forbidden, restricted.

REPLICAS of very first issue of *TAPE Recording Magazine* (February 1957). Unobtainable for years. 2s. 6d. (USA \$0.65)

TAPE HANDBOOKS

FOR THE NEWCOMER as well as the ENTHUSIAST OF LONG-STANDING

Advice on Buying a Tape Recorder by J. F. Ling.

2s. 6d. (USA \$0.65) post free.

Chapters on preliminary considerations, tape deck, amplifier, etc.

Introduction to the Tape Recorder. by C. Langton.

3s. 6d. (USA \$0.75) post free.

To help the newcomer to a working knowledge and maximum enjoyment

Sound Effects on Tape by Alan Edward Beeby.

3s. 6d. (USA \$0.75) post free

How to achieve realistic effects simply and economically.

Tape and Cine by John Aldred.

3s. (USA \$0.70) post free.

With practical advice on synchronising methods, etc.

How to Record Weddings by Paul Addinsell.

3s. (USA \$0.70) post free.

Illustrated. Covers preparation, mike positioning, equipment, etc.

Hi-Fi for the Music Lover by Edward Greenfield.

3s. (USA \$0.70) post free.

Aims at giving the music lover basic technical know-how.

How to Make Money with Your Tape Recorder by Henry Woodman.

3s. 6d. (USA \$0.75) post free.

How to go about getting assignments and turning events into hard cash.

49. **Comedy Scripts for Tape Recording** by Peter Cagney. ("Scotch"). 3s. 6d.

50. **Dramatape Guide** by Woodman. 7s. 6d.

37. **Tape Recording for Pleasure** by Wallace Sharps. 128 pages. 3s. 6d.

38. **Ribbons of Sound** by Karl Barleben. A USA publication and guide. 8s. 6d.

40. **Simple Radio Circuits** by A. T. Collins, editor of *Practical Wireless*. 3s. 6d.

41. **Hi-Fi and Audio** by A. T. Collins. Useful introductory paperback. 3s. 6d.

TAPE BOOKSHOP

7 TUDOR STREET, LONDON

E.C.4

Cheques and Postal orders payable to Print & Press Services Ltd.

YOUR LOCAL DEALER

LONDON

TAPE RECORDER HI-FI CENTRE (SHEEN) LTD.

— The Centre for —

FRIENDLY HELP—SALES—SERVICE DEMONSTRATIONS ANY TIME—ALL PRE-RECORDED TAPES—STEREO—MONO LANGUAGES—DANCE—JAZZ—SHOWS CLASSICS, etc.—2 and 4 TRACK—STOCKISTS OF ALL MAKES AND MODELS OF RECORDERS AND HI-FI—Add sound to your movies with Synchrondek—WE ARE STOCKISTS OF SYNCHRODEK

TERMS—EXCHANGES, ETC.

3/4 STATION PARADE, SHEEN LANE, SHEEN, LONDON, S.W.14 (Opposite Mortlake Station, S.R.)

Showroom: PROspect 0985

9 a.m.—6 p.m.; Fridays 9 a.m.—8 p.m.

WIMBLEDON'S TAPE RECORDER CENTRE

ALL LEADING MAKES IN STOCK

FERROGRAPH, etc.—Stereo—Mono

—Pre-Recorded TAPES—

Accessories—MICROPHONES, etc.

● Qualified Staff of long experience at your disposal backed by fully equipped workshop for GUARANTEED 100% AFTER-SALES SERVICE

TEL-LEE-RADIO

220 THE BROADWAY,

Wimbledon, S.W.19.

LIBerty 4946

THE SOUTH

SOUTHAMPTON

Tape Recorder Specialists

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

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

RECORDING MACHINES LTD.

79 Queensway, Southampton

Telephone: 27092

PLYMOUTH

TOM

MOLLAND LTD.

102 CORNWALL STREET

Phone: 69282

FERROGRAPH, REVOX, TANDBERG, SIEMENS, AKAI, UHER, SONY, B & O STEREOMASTER, FI-CORD, AND

The largest selection of Hi-Fi equipment in the West

YOUR LOCAL DEALER

THE NORTH

**CUSSINS &
LIGHT LTD.**

YORK'S LEADING RADIO
TV & ELECTRICAL STORE

Visit our First Floor
TAPE RECORDER
CENTRE

LARGEST RANGE
OF RECORDERS
& ACCESSORIES
IN THE NORTH

**KING'S SQ.
YORK**



CHESHIRE

CHARLESWORTH'S
OF CREWE LTD.

**Tape Recorder
and Hi-Fi Specialists**

HEAD OFFICE:
14 HIGHTOWN, CREWE. Tel. 2535
TECHNICAL DIVISION:
19/21 LUDFORD ST., CREWE

**TAPE RECORDER
CENTRE (Halifax)**

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

30 King Cross St., Halifax. Phone 66832

**THEATRE ORGAN
DISCS and TAPES**

ORGAN OF THE MONTH CLUB
brings out a new Theatre Pipe Organ
record each month.

Our discs are playable on Mono or Stereo
equipment. Approx. 38 minutes playing
time 31/6d.

7½ i.p.s. 4 track stereo tapes 41/7d.

Full details from:

CONCERT RECORDING
P.O. BOX 2,
ROTHWELL, KETTERING, NORTHANTS

NEW PRODUCTS

**FOUR NEW MODELS
FROM
DENHAM & MORLEY**

FOUR new models introduced by Denham & Morley at the Radio Show are the Japanese-manufactured Standard SR-100 and SR-300, the Norwegian Radionette Multicorder, and the Butoba ATB70 cassette-loaded car tape recorder.

The SR-100 (illustrated below) is a cassette-loaded machine designed for use with the Philips Musicassettes. Operating at 1½ ips it is powered by six UM-3 dry cells and can also be operated via an adaptor from the mains supply.

Fully transistorised, six tubes, it measures 7 x 4½ x 2½ inches and weighs 2½ lbs. It features a 1½-inch round loudspeaker handling the power output of 300mW and has a quoted frequency range of 100-6,000 cps. The playing time is thirty minutes for each of two tracks on the eighth-inch wide tape used. It costs 25 guineas.



The SR-300, illustrated top, is a two-speed half-track recorder operating at 3½ and 1½ ips. With accommodation for 3½-inch spools it will provide a playing time of 9 minutes per track using standard-play tape (175 ft.) at 3½ ips.

The quoted frequency range is 200-6,000 cps.

Designed for vertical operation, the transistorised SR-300 is powered by six UM-2 dry cells or via mains supply using the adapter supplied. It features a 2½-inch round loudspeaker handling the power output of one watt, a meter recording level indicator and remote control operation via the microphone switch. Measuring approximately 8 x 8 x 3 inches, it weighs 5 lbs. The price has still to be announced.

The introduction of the Multicorder heralds Denham's appointment as U.K. Agents for the Norwegian Radionette equipment. The Multicorder, illustrated right, is another battery-mains operated recorder.

With tape speeds of 3½ and 1½ ips, and accommodation for 5-inch spools, it provides a playing time of 32 minutes for each of its four tracks using standard-play tape



(600 ft.) and 3½ ips. The frequency range is quoted as covering 10,000 cps ±3dB and wow and flutter is given as better than 0.2 per cent.

Among the features are meter recording level indicator combined with battery life indicator, pause control, combined tone control and digital rev counter. The price is 49 guineas.

Their second cassette recorder is the Butoba ATB70 which is designed with provision for a built-in radio tuner unit.

Operating at a non-standard tape speed of 3 ips, the ATB70 has a quoted frequency range of 50-12,000 cps and utilises an endless tape cassette giving 24 minutes playing for each of its four tracks.

Among the features are automatic recording level control, pause control, combined tone control, and facilities for operation from five U2 batteries or AC mains. It has a power output of 1½ watts which can be augmented with a six-watt amplifier, provision for which is made in the car mounting bracket.

The ATB70 measures 10¼ x 9 x 3½ inches and weighs 9½ lbs.

Denham & Morley Limited, 173-175 Cleveland Street, London, W.1.



THE SILVER VOICE A NEW SPEAKER BY ADASTRA

LAATEST unit from Adastra is their "Silver Voice 15" loudspeaker which has been developed for use in audio systems either as a twelve-inch full range speaker or with mid-range and high note units.

The Silver-Voice is designed to handle a frequency range from 25-16,000 cps and has a power rating of 15 watts (RMS) or thirty watts peak. It features a 1½-inch diameter aluminium voice coil coupled to the Silver Disc HF diffuser. Other features include a stress-free cone with plastic foam surround, dust proof centring device, and a cast chassis in silver enamel finish. The impedance is 15/16 ohms.

Overall diameter is 12¼ inches, overall depth being 5½ inches and the weight 6¼ lb. Connections are via screw terminals. The Silver Voice 15 will retail at 9½ guineas.

Adastra Electronics Ltd., 167, Finchley Road, Swiss Cottage, London, N.W.3.

WOW & FLUTTER METER AND FREQUENCY TEST DISC FROM LENNARD DEVELOPMENTS

THEIR appointment as UK distributors for wow and flutter meters manufactured in Germany is announced by Lennard Developments, who also introduce frequency test records to DIN and CCIR recommendations.

The meter is the ME101 manufactured by Tech. Phys. Lab. Dipl. Ing B. Woelke of Munich. This is a fully transistorised unit designed for multiple testing and after-sales service work together with laboratory investigations, it features standardised sockets for direct connection to tape recorders for home use in addition to the normal measuring connections.

The test records are twelve-inch discs for wow and flutter measurement to DIN and CCIR recommendations. Pressed in this country, the discs feature two bands on each side, one for 33 rpm the other for 45 rpm (zero level 5 cm/sec), and include a 3,150 cps frequency tone. Primarily intended for use in conjunction with the ME101 meter, these records are also available for use with other equipment.

Lennard Developments Ltd., 7, Slades Hill, Enfield, Middlesex.

NEW PORTABLES DISTRIBUTED BY HEDDON-SMITH



TWO mains and battery-operated tape recorders have been introduced by the Heddon-Smith Group Ltd. First of the new models is the 29½ guinea/CTR5450 two-speed recorder operating at 3¼ and 1½ ips.

The CTR5450, illustrated above, is a transistorised recorder with accommodation for five-inch spools providing a playing time of 32 minutes for each of its two tracks using standard-play tape (600 ft.) at 3¼ ips.

Brief specifications indicate features including fast powered rewind, recording level indicator, tone control, safety erase lock to prevent accidental erasure and an output of 700 mW.

It measures 11¼ x 8¾ x 4 3/16 inches and weighs 8 lb. The price includes a dynamic microphone with remote control stop/start and earphone.



Second new model is the CTR3000, illustrated above. Also transistorised, this model accommodates 3¼-inch spools providing a playing time of 8 minutes per track using standard-play tape (150 ft.) at 3¼ ips. It has an alternative speed of 1½ ips.

Measuring approximately 8½ x 8½ x 3½ inches it weighs 5 lb., operates from four U2 batteries and is easily adapted for AC mains operation.

Included in the price of 19 guineas is a remote control dynamic microphone, earphone, three-inch reel and a demonstration tape.

Heddon-Smith Group Limited, Heddonia House, 7-9 William Road, London, N.W.1.

RAPID RECORDING SERVICE

78s and LPs FROM YOUR OWN TAPES
48 HOUR SERVICE

MASTER DISCS AND PRESSINGS
RECORDING STUDIO
DEMONSTRATION DISCS
MOBILE RECORDINGS—ANY DISTANCE

Brochure on request from

Rapid Recording Service
21, BISHOPS CLOSE, LONDON, E.17

SUBSCRIBE TO TRM

and receive your monthly copy by post for 1 whole year (12 issues). Send 25s. (USA \$3.75) by postal order or cheque today.

25/-
U.S.A.
\$3.75

TO: TAPE RECORDING MAGAZINE
7, TUDOR ST., LONDON, E.C.4

Name

Address

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

The demand for "Tape Recording Magazine" is increasing. To be sure of getting your copy regularly you should place an order with your newsagent. Use the form below.

ORDER TO NEWSAGENT

FOR

"TAPE RECORDING MAGAZINE"

Published on the third Wednesday in every month. Price 2s. 0d.

To

(Newsagent's name and address)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



A Winner

The DP4 microphone is another winner—by performance alone it has achieved world wide acclaim. It is used regularly by P.A. engineers, broadcasting and television companies, film studios, etc., as well as by many professional and amateur tape recordists. Its winning qualities have been designed and produced by Grampian—specialists for over thirty years in the field of sound equipment. We shall be pleased to send you full technical details of the DP4 and other microphones, together with descriptions of various accessories.

Specially designed to use with the DP4, in order to cut down wind noise is the Windshield — as illustrated here.



There is also the "Grampian" Parabolic Reflector. Where it is not possible to place a microphone close to the source of sound such as when making recordings of bird songs, weddings, car and train noises etc. the Parabolic Reflector has been proved over and over again to be of enormous value.



Grampian Reproducers Ltd.,
Hanworth Trading Estate, Feltham, Middlesex.

K. J. ENTERPRISES

BRITAIN'S PREMIER MAIL-ORDER
RECORDING TAPE SPECIALISTS
IMMEDIATE 24 HOUR SERVICE ON ADVERTISED LINES

SEND TODAY AND SAVE!

● NEW AMAZING OFFER! ● AGFA TAPE—HALF PRICE!

Another bulk purchase of 5,000 reels of this world renowned Polyester Tape enables us to repeat our half price offer. Brand new, with full leader, stop oil and polythene sealed.

1200' on 7" reel. Normally 35/-. OUR PRICE 19/6. P. & P. 1/6d.
Three reels for 55/6, Six reels for 105/- post free. Boxed add 1/- per reel.

GRUNDIG TAPE 40% Off

Brand new, fully guaranteed, Premium Grade Magnetic Tape. Complete with the specially designed Grundig Plastic Tape Storage Cassette (Except 7" size which is in Manufacturers' Cardboard Boxes). Full leader and stop foil at both ends, and suitable or use with all makes of tape-recorder.

DON'T MISS THIS RARE OPPORTUNITY. SEND NOW!

TYPE	DESCRIPTION	LIST PRICE	ONE	THREE	SIX
GL18	1800' L/P 7" reel	50/-	29/6	86/-	165/-
GL15	1200' L/P 5½" reel	35/-	22/6	65/-	125/-
GS15	900' S/P 5½" reel	28/-	17/-	49/-	93/-

Post and Packing 1/6d. for single reels. OTHERWISE POST FREE!

ILFORD TAPE NEAR HALF PRICE

A bulk purchase of premium grade, top quality POLYESTER MAGNETIC TAPE from one of the world's foremost experts in film coating technology. With FULL LEADER stop foil, Polythene wrapping, and in original manufacturer's boxes. Available in long-play base only at these BARGAIN PRICES!

	ONE	THREE	SIX
900' on 5" reel. List price 28/-	16/6	48/-	90/-
1800' on 7" reel. List price 50/-	28/6	84/-	160/-

Please add 1/6 p. & p. for single reels. Otherwise POST FREE!

TRIPLE PLAY TAPE—HALF PRICE!

A large purchase from a famous world renowned manufacturer enables us to make this unique half-price offer. Brand new, fully guaranteed, premium grade Polyester Base Tape with FULL LEADER and stop foil. In original maker's boxes and polythene wrapped at these EXCEPTIONALLY LOW PRICES!

	LIST PRICE	ONE	THREE	SIX
450' on 3" reel	22/-	12/-	35/-	66/-
600' on 3½" reel	27/6	14/6	42/6	82/6
900' on 4" reel	39/-	20/6	60/-	117/-
1800' on 5" reel	66/-	34/-	101/-	198/-
2400' on 5½" reel	90/-	46/-	137/-	270/-

Post and Packing 1/6. ORDERS OVER £3 POST FREE

SCOTCH MAGNETIC TAPE AT NEARLY HALF-PRICE!

Over 3,000 REELS of top quality MAGNETIC TAPE, double coated, SCOTCH made to the best possible specification and intended for the electronic industry. This type of tape is rarely, if ever, offered for domestic consumption and is unobtainable elsewhere.

THIS UNREPEATABLE OFFER REMAINS OPEN ONLY WHILE STOCKS LAST! DON'T DELAY—SEND NOW!

SCOTCH (150 D/C) Polyester L/P, 900' on 7" reel. ONLY 15/6, p. & p. 1/6. Three reels for 45/-, post free; six reels for 84/-, post free. Boxed, add 1/- per reel. Can be supplied on 5½" reels at special request.

Don't forget our other ACCESSORY BARGAINS!

Tape Head Demagnetiser, essential for any enthusiast! Fully guaranteed. Worth 50/-	Ready for immediate use. Only 27/6	P. & P. 1/6
Tape Splicer, fully auto., no razor blades. Worth 32/6	Only 16/6	P. & P. 1/6
Deram Stereo Transcription Cartridge	Only 75/-	Post free
Gevaert Tape 600' 5½" reel (boxed)	10/6 (p.p. 1/6)	or 3 for 30/- post free
International Polyester Tape 2,400' 7" reel (boxed)	Only 25/-	P. & P. 1/6
Boxed 8½" Zonal Reels	3 for 15/-	post free

SEND FOR LISTS OF OTHER TAPE AND HI-FI BARGAINS

K. J. ENTERPRISES. (Dept. T), 7 MASONS AVENUE, WEALDSTONE, MIDDLESEX (OPPOSITE HAPROW & WEALDSTONE STATION) HARROW G395 (CLOSED P.M. WED. & SAT.) REFUND GUARANTEE

FRANCIS OF STREATHAM

MAINS TAPE RECORDERS

*Ampex 800 Series	£127.10.0
*Ampex 1100 Series	£149.10.0
*Akai 1700	79 gns.
*Akai X-300	190 gns.
*Akai 910	62 gns.
*Akai M8 Stereo	136 gns.
Akai 355 Stereo	239 gns.
*Beocord 2000	119 gns.
*Beocord 2000 de luxe	135 gns.
*Beocord 1500	89 gns.
*Beocord 1500 de luxe	105 gns.
*Brenell STB2	£150.0.0
*Brenell Mk. 5/M Series 3	93 gns.
*Brenell Mk. V Series 3	74 gns.
Elizabethan LZ32	41 gns.
Elizabethan LZ34	34 gns.
Ferguson 3218	33 gns.
Ferguson 3222	33 gns.
Ferguson 3224	44 gns.
*Ferrograph 633	120 gns.
*Ferrograph 631	95 gns.
*Ferrograph 632 Stereo	126 gns.
Fidelity Playmatic	28 gns.
Grundig TK400 2sp. 4 Tr.	47 gns.
Grundig TK14L	37 gns.
Grundig TK17L	43 gns.
Grundig TK18L	41 gns.
Grundig 23L Auto	49 gns.
Grundig TK40 4 Tr.	87 gns.
Grundig TK41 2 Tr.	83 gns.
Grundig TK120	29½ gns.
Philips 3556	62 gns.
Philips 3558	42 gns.
Philips 3553	36 gns.
Philips 3552	24 gns.
*Revox 736	124 gns.
Sony TC260	95 gns.
Sony 250A Deck/Pre-amp	59 gns.

Sony 200	72 gns.
Sony 500	105 gns.
Sony 600	127 gns.
Stella 463	39 gns.
*Tandberg Series 6	110 gns.
*Tandberg Series 8, 2 Tr.	54 gns.
*Tandberg Series 8, 4 Tr.	59 gns.
Tandberg Series 12	105 gns.
Telefunken 203	69 gns.
Telefunken 201	44 gns.
Telefunken 200	39 gns.
*Telefunken 85 de luxe	83 gns.
*Telefunken 98, ½ Tr. St.	95 gns.
Truvox R.102 and 104	89 gns.
*Truvox PD102 and 104 St.	105 gns.
Truvox R40	44 gns.
*Uher 724L	75 gns.
*Vortexion WVA, 3 speed	£96.7.0
*Vortexion WVB, 3 speed	£115.10.0
*Vortexion CBL Stereo	£172.0.0
*Van der Molen	59 gns.
*Uher 784 Royal	129 gns.
*Uher Hi-Fi Special	129 gns.

BATTERY PORTABLES

Akai X-IV, 4 Tr. Stereo	131 gns.
Cossor 1621	26 gns.
Grundig EN3 Notebook	23 gns.
Grundig TK6L	73 gns.
Loewe Opta 408	39 gns.
Loewe Opta 416	51 gns.
Philips EL3301	26 gns.
Philips 3586	22 gns.
Sanyo Auto	22 gns.
Sanyo Batt./Mains	36 gns.
Stella 472	26 gns.
Telefunken 300	49 gns.
Telefunken 301 4 Tr.	54 gns.
Uher 4000L	103 gns.

*Microphone extra

LEADING STOCKISTS OF EQUIPMENT FOR TAPE and HI-FI

... and NO EXTRA FOR CREDIT TERMS

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

Prices subject to alteration as announced by manufacturers

MAINS POWER PACKS

Philips, Stella or Cossor	£5.12.0
Uher 4000, with cell	18 gns.
Telefunken 300, with cell	£16.17.0

TAPE DECKS by Brenell, Wearite. TAPE-TO-DISC and Copy Service.

MICROPHONES, MIXERS, etc.

Hammond Condenser M100	29 gns.
AKG D14S	£10.0.0
AKG D119	£20.10.0
AKG D19C	£17.10.0
AKG K50 Headphones	£7.10.0
Eagle Mixer	£3.3.0
Grampian Reflector	£6.15.0
Grampian DP/4 Dynamic	£8.5.0
Grampian Ribbon	£11.10.0
Grundig Mixer (Stereo)	18 gns.
Philips Preamp	£6.10.0
Reslo Ribbon	£12.2.0

Also in stock: microphones by ACOS, BEYER, FILM INDUSTRIES, TELEFUNKEN, etc.

● DEFLUXERS by Wearite, Walsingham

PRE-RECORDED TAPES

by Columbia, H.M.V. and all E.M.I. labels, Crown, Phonoband, Eagle, etc.

TAPE SPlicERS by Bib, Bond, E.M.I. Matching transformers, plugs, sockets, etc.

STANDS of all types. TAPES

Hi-Fi Dept.

● AMPLIFIERS (mono & Stereo)
Quad Scott Tripletone
Leak Rogers Cadet Mk. III
Armstrong B. & O. Pye
Truvox

TUNERS

Quad Rogers B. & O. Leak
Armstrong Pye Tripletone

LOUDSPEAKERS

Quad Pye W.B. Wharfedale
Goodmans Tannoy Leak
Lowther Kef Rogers Elac
S.H.B. Tandberg B. & O.
Truvox Ditton

MOTORS, PICKUPS

Garrard incl. Thorens
AT6, 40l, etc. Tannoy
Goldring Shure
Connoisseur Ronette
Decca Sonotone
Transcriptor B. & O. BSR
Philips SME Mk. II
Ortofon Pickering
Acos ADC

All types of Diamond and Sapphire styli, stereo and mono. Microlifts, Garrard, Goldring, Acos Pressure Gauges; Disc Prener, Acos Dust Bug

● CABINETS—Record Housing and GKD

Please send our only address as below

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

Between St. Leonard's Church and Streatham Station
OPEN ALL DAY SATURDAY—1 p.m. Weds.

STReatham 0466/0192

● FREE CAR PARK, Prentis Road



The Hi-Fi models which present realism and beauty of Music

at such competitive prices.

favourable deferred terms over £10

Hear the BBC Stereo Programmes on the TRANSISTOR STEREO FM TUNER.

Elegantly designed to match the stereo amplifier, Model AA-22U.

Available in two units, sold separately, can be built for

TOTAL PRICE KIT (STEREO) TFM-IS £24.18.0 incl. P.T.

Kit (MONO) £20.19.0 incl. P.T. (stereo adapter available as extra). Cabinet, optional extra £2.5.0. Send for full details.



TRANSISTOR FM TUNER



FM TUNER



TM-1

● TRANSISTOR MIXER. Model TM-1

A must for the tape enthusiast. Four channels with individual continuously variable controls. Master volume control, 9v battery operation. Beautiful walnut veneered cabinet.

Kit £11.16.6. Assembled £16.17.6. Prices include cabinets.

● TAPE EQUIPMENT

Pre-Amplifier (MONO) TA-1M	Kit £19.18.0.	Assembled £28.18.0.
Pre-Amplifier (STEREO) TA-IS	Kit £25.10.0.	Assembled £35.18.0.



363

Model D93-2 ½ track } Stereo either model
Model D93-4 ¼ track } £36.15.0

TRUVOX D-93 TAPE DECKS

MAGNAVOX—363 DECK—3-speed Mono
2 track. £13.10.0.; with TA-1M Kit, £31.5.6.



D-93

● STEREO/MONO AMPLIFIERS

A wide range available including:—

20 × 20 watt Transistor Stereo Amplifier, Model AA-22U.
Kit £39.10.0. (less cabinet). Walnut veneered Cabinet, £2.5.0. extra.

9 × 9 watt Stereo Amplifier, Model S-99. Within its price range an outstanding integrated amplifier. Kit £28.9.6. Assembled £38.9.6.

3 × 3 watt Stereo Amplifier, Model S-33H. A low-priced unit, ideal for use with the Deram cartridge. Kit £15.17.6. Assembled £21.7.6.

5 watt Mono Amplifier, Model MA-5. Kit £11.9.6. Assembled £15.15.0.

● LOUDSPEAKER SYSTEMS AND SPEAKERS

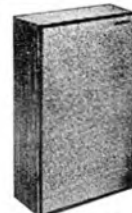
Berkeley Speaker System Kit with beautiful walnut veneered fully finished cabinet. 2 Loudspeakers. Frequency range 30-17,000 c/s. Kit £19.10.0.; Assembled £24.0.0.

Cotswold or MFS Systems

Frequency range 30-20,000 c/s. 3 Loudspeakers. Either model: Kit £25.12.0.; Assembled £33.17.0.

SSU-1 Low Cost System

Frequency range 40-16,000 c/s. 2 Loudspeakers. Size 23" × 11½" × 1½" deep. Kit £11.17.6. (incl. P.T.), legs 14/6 extra.



BERKELEY

M. Order prices quoted include delivery U.K.

THE HEATHKIT (INCL. CENTRE

See the complete British Heathkit range and a selection of American models at 233 Tottenham Court Road, W.1. Tel.: MUSEum 7349.

Opening Times: MON-SAT. 9 a.m.-5.30 p.m. THURS. 11 a.m.-2.30 p.m.

We hope that you will visit us there.

DAYSTROM LTD. Dept. T.10, GLOUCESTER

Without obligation please send me

FREE BRITISH HEATHKIT CATALOGUE

Full details of Model(s).....

Name

Address

(Block capitals please).....

T.10

CLASSIFIED ADVERTISEMENTS

Rate.—One shilling per word; box numbers, 2s. 6d. extra. Payment with copy, which should be sent to Advertising Department, "TAPE Recording Magazine," 7, Tudor Street, London, E.C.4.

VACANCIES

TAPE RECORDER SALESMAN required by busy City specialists. Trainee considered, enthusiasm main asset. Equivalent 5-day week approx. alternate Sats. Opportunity to join an organisation of repute. PLEASE WRITE in first instance to Mr. Atkins, WALLACE HEATON (City Sale) Limited, 93 FLEET ST., London, E.C.4.

FOR SALE

E.M.I. L.4 PROFESSIONAL PORTABLE. PERFECT. Cost £146 28 weeks ago. Offers. GROSVENOR 8870 (evenings).

BLACKBURN has Lancashire's leading Hi Fidelity/Tape Recorder stockists and Electronic Engineers at HOLDINGS AUDIO CENTRE, MINCING LANE/DARWIN STREET, BLACKBURN (Tel. 59595).

GEVAERT new boxed Recording Tapes: 600 ft. (5½ in. spool) at 9s. each or 6 for 50s. GRUNDIG 2-transistor Pre-amplifiers suitable for boosting microphones and tape head monitoring—listed at 4½ gns.—OFFERED NEW and boxed at 57s. 6d. each. LEE ELECTRONICS, 400, Edgware Road, W.2. PADDINGTON 5521.

E.M.I. PROFESSIONAL UNUSED TAPE—Long Play—3,600 ft. HIGHCHUTE LTD., 359, OXFORD STREET, W.1 (GRO 7288).

VORTEXION-C.B.L. STEREO TAPE RECORDER, £120. Wilkins, East Burnham Well, FARNHAM ROYAL, Bucks.

FERROGRAPH CABINET MODEL with WHARFEDALE Speaker in Mahogany Cabinet. £60 o.n.o. HIL 7484.

AKAI X300 TAPE RECORDER still in maker's box. New. Must sell fast. £155. Phone RAINHAM Essex 51769 after 8 p.m.

TAPE EXCHANGES

BELOW are listed tape recorder owners wishing to contact others with similar interests.

Waite, Roy W. (39). 7, Deacon Road, Kinson, Bournemouth, Hampshire. Cine and slide photography, music. 3½ 1½ ips. 7-inch spool. Stella ST458 and Philips EL3541, four-track, Stella ST471, battery portable.

Whitehead, Henry (30). Connaught Barracks, Dover, Kent. Photography, films, music, not classical. 7½, 3½ ips. 7-inch spool. Grundig TK60 and TK27. Female contacts preferred. Holland, Denmark, USA, Hawaii. Letters first please.

Williams, Raymond George (39). 65, Tudor Avenue, Watford, Hertfordshire. Electronics, serious music. 15, 7½, 3½ ips. 7-inch spool. Collaro tape deck with Type "C" amplifier. Sweden, Holland.

MAGNETIC TAPE

A UNIQUE TAPE BUY! Top brand 7 in., 2,400 ft., 25s.; 5½ in., 1,200 ft., 15s.; P & P: 1 at 2s., 2 at 2s. 9d., 3 to 6 at 3s. 6d. BARGAINS in all sizes. S.A.E. for list. E. C. KINGSLEY & Co. Ltd., 93, Tottenham Court Road, LONDON, W.1. EUSton 6500.

TAPE DUBBING

E.R.S. RECORDS: TAPE/DISC. Vari-groove High Level Recordings with WIDE FREQUENCY RANGE. Top quality pressings. 162, SHIRLAND ROAD, LONDON, W.9.

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

JOHN HASSELL RECORDINGS. Tape-to-Disc Service using latest high level disc-cutting system. Quality pressings made. Studio with Bechstein Grand, Mobile unit. 21, Nassau Road, London, S.W.13. RIVerside 7150.

TAPE-TO-DISC RECORDING. Finest professional quality. 10-inch LP—42s. (32 mins.), 12-inch LP—48s. (45 mins.), 7-inch EP—21s.

40 ft. RECORDING STUDIO S.A.E. for leaflet to DEROY Sound Service, High Bank, Hawk Street, CARNFORTH, Lancs.

TAPE TO DISC by PATRICK O'MAHONY & CO. LTD. High Fidelity gramophone records made to your own requirements from TAPE, RADIO, and TV SOUND. Highest Quality Pressings: Mobile unit 10-inch LP (32 mins.), 35s.; 7-inch EP (15 mins.), 20s.; 7-inch POP (6 mins.), 16s. SPECIALITY 45s. Full editing facilities, 5s. per record, pop 45s. free. Post & Package, 2s. 6d. Tapes of any size, speed, track, stereo or mono. Fully professional RECORDING STUDIO and staff; qualified musicians for sound control balance. Associate of Professional Recording Studios Ltd. 48-hour return postal service. S.A.E. for brochure: 30 BAKER STREET, LONDON, W.1. (Tel.: WELbeck 0441-2 and Southampton 75453).

TAPE EXCHANGES

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

Join TAPEMATES INTERNATIONAL and exchange tapes with friends throughout the World. Club and recording booths 6p.m.-10.30 p.m. Tuesdays, Thursdays and Saturdays. 6, Holland Park Avenue, London, W.11.

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

Wilkinson, John (31). 34, Gregory Crescent, Eltham, London, E.9. Motoring, all sports. 3½ ips. 5½-inch spool. Fidelity Playmaster.

Wilson, George (41). 23, Highfield Street, Cemetery Road, Pudsey, Yorkshire. 7½, 3½, 1½ ips. 7-inch spool. Kolster-Brandt and Stella, four-track.

Woolf, Norman (28). 42, Coleraine Road, Blackheath, London, S.E.3. Painting, travel, music. 7½, 3½, 1½ ips. 7-inch spool. Male contacts preferred in UK, USA, Israel.

Wrench, Alan (33). 20, Cranage Road, Levenshulme, Manchester 19, Lancashire. History of American Civil War. 7½, 3½ ips. 7-inch spool. Civic recorder. USA.

Young, James P. (21). 7, Rugby Road, Kilmarnock, Ayrshire, Scotland. Motoring, shooting, bowling, music. 7½, 3½, 1½ ips. 7-inch spool. Elizabethan LZ29, Grundig TK23. Letters not required.

Young, Stan (45). 8, Kings Road, Egham, Surrey. Jazz, pop and beat music. 7½, 3½, 1½ ips. 7-inch spool. Grundig TK46.

YOUR RECORDER is an electronic, mechanical marvel... do you utilize it fully? Let WORLD-WIDE TAPE TALK tell you how! 3d. Stamp only. WWTT (TRM), 35, The Gardens, HARROW.

MISCELLANEOUS

Audio Supply saves members' money. 65-page Hi-Fi catalogue with technical specifications 4s. 6d. Unbiased advisory service. Tapes transferred to LPs. (Pressings for fund-raising.) 18, Blenheim Road, London, W.4.

HIGHEST CASH PRICES offered for good quality Tape Recorders and Hi-Fi. See our advert., page 304 this issue. R.E.W., 266-8, Upper Tooting Road, London, S.W.17.

NEW EQUIPMENT

CASH DISCOUNT on most famous makes of Tape Recorders, Hi-Fi equipment, Cameras and Typewriters, to Club Members. Join England's largest Mail Order Club now and enjoy the advantages of bulk buying. Send 5s. for membership card, catalogues, price lists, and ask for quotation on any item. C.B.A. (DEPT. AI), 370, ST. ALBANS ROAD, WATFORD, HERTS.

CONSIDERING REPLACING YOUR RECORDER? Worried about the cost? Then to obtain Britain's highest part-exchange allowance simply request quotation against model of your choice! E.G., £25 Elizabethan Pop 400 against Ferrograph 631; £24 TK14 against Brenell MK V; £28 Philips 3541 against Sony TC260; £40 Philips 3549 against Beocord 2000 De Luxe! JOHN MUNRO, TAPE RECORDER SPECIALIST, LIBRARY HOUSE, LOSSIEMOUTH, MORAYSHIRE.

HAVE YOU HAD DETAILS OF MY INEXPENSIVE RMS FLUTTER-METER? Also available on hire. Leaflets on request. V.H.M., 35, VILLERS ROAD, WATFORD, HERTS.

TAPE RECORDERS. SAVE FROM 30 per cent to 60 per cent on the original price. Large stocks of second-hand, new, shop-soiled machines. All guaranteed. Obtainable on our NO INTEREST TERMS. Best part-exchange allowances on your existing equipment. CALL, WRITE, PHONE today for free list. Quotation and details. Our Mail Order covers the whole Country.—R. E. W. Earlsfield Ltd., 266, Upper Tooting Road, London, S.W.17. BALham 9174-5.

EDUCATIONAL

HYPNOPEDIA = SLEEP-LEARNING. Apply to THE AUTHORITY in Great Britain for details of research and equipment. Free Advisory Service (Panel of Consultants) for Members. THE SLEEP-LEARNING ASSOCIATION, 14, Belsize Crescent, London, N.W.3. Tel.: SWI 6160.

PUBLICATIONS

A CURIOSITY? A COLLECTOR'S PIECE? Now available limited reprint edition of very first issue of TAPE Recording Magazine (Feb., 1957). 2s. 6d. (USA \$0.65) POST FREE. Cheque or postal order to TAPE, 7, Tudor St., London, E.C.4.

IF YOU WANT a sturdy BINDER for your TAPE Recording Magazine issues there's one specially made for them. Two-tone green simulated leather finish, gold-stamped title on spine. Each magazine can be inserted as received. An ideal gift. 14s. 6d. post free (16s. 3d. outside UK). Remittance with order to: Print & Press Services Ltd., 7, Tudor St., London, E.C.4.

TAPE YEARBOOK 1966 edition. Only tape recorder annual published. Lists available, tape recorders, decks, microphones, etc., and includes specifications and prices. Also lists TAPE CLUBS under area headings and much more helpful information to the Amateur and Professional Recordist. Price 7s. 6d. post free. Cheque or postal orders to TAPE, 7, Tudor St., London, E.C.4.

THE LAW and Your Tape Recorder by Andrew Phelan, Barrister-at-Law. Excellent NEW booklet which interprets many aspects of UK Law for tape recorder owners. 3s. 6d. post free. Remittance with order to: PRINT & PRESS SERVICES LTD., 7, Tudor St., London, E.C.4.

NOW IN ITS SECOND REPRINT, Alan Beeby's informative handbook SOUND EFFECTS ON TAPE. Invaluable to all dramatists and recording enthusiasts. Tells in practical terms not only what to do but also how and why. 3s. 6d. post free. Remittance with order to Print & Press Services, 7, Tudor St., E.C.4.

YOU OUGHT to send for a copy of "Psychology and Whisper Teaching" to York House, New North Road, Huddersfield (5s. 9d. post free).

TAPE RECORDS

AMERICAN 4-TRACK STEREO TAPES are considerably CHEAPER from DUBLIN: all labels and prices from HARRISON catalogues at 2s. 6d. Details: MUSIC U.S.A., 201, Pearse St., DUBLIN 2, Ireland.

AMERICAN 4-TRACK STEREO TAPES covering most famous labels at REALISTIC prices. Why pay more? Imported directly by us, saving distributors' profits. Vast selection at 75s. each. Send S.A.E. for free lists or call at London showrooms, TELETAPE of Marble Arch, 33, Edgware Road, W.2.

INDEX TO ADVERTISERS

Agfa-Gevaert Ltd.	Back cover
Ampex (Gt. Britain) Ltd.	382
Audio Engineering Ltd.	392
Bang & Olufsen U.K. Sales Division	384
Berean Forward Movement	421
British Radio Corporation (Ferguson Div.)	407
Brockley Trading Co.	400
A. Brown & Sons Ltd.	409
Charlesworth's of Crewe	414
Concord Recording	414
Cussins & Light Ltd.	417
Daysream Ltd.	417
Elizabethan Electronics Ltd.	388
Elastone Electronics Ltd.	393
E.M.I. Records Ltd.	408 and 419
E.M.I. Tape Ltd.	404
Educational Recordings	421
The Ferrograph Co. Ltd.	397
Francis of Streatham	417
Global Products	421
Grampian Reproducers Ltd.	416
Greene & Cooper Ltd.	412
Grundig (Gt. Britain) Ltd.	385

Highgate Acoustics	410
Institute of Sleep Learning	421
Jordan Watts Ltd.	409
K.J. Enterprises	416
Kodak Ltd.	389
Lee Electronics	412
Lennard Developments	412
Magnegraph	412
Marhan Exporting Corporation	400
Multicore Solders Ltd.	400
Metrosound Manufacturing Co.	410
Minnesota Mining & Manufacturing Co.	391
Nash House Electronics	405
NuSound	383, 387, and 423
Pullin Photographic Ltd.	402 and 403
Rapid Recording Service	415
Recording Machines Ltd.	413
R.E.W. Earlsfield	420
The Recorder Co.	409
Recording Developments	400
Sheen Tape Recording Centre Ltd.	413
Sony U.K. Sales Division	390
Tape Recorder Centre (Halifax)	414
Tel-lee-Radio	413
Tom Molland Ltd.	413
Vortexion Ltd.	386

EMI Musicassettes

**1⁷/₈ I.P.S. 4 TRACK
MONO-STEREO
COMPATIBLE
TAPES**



a ★
star
studded
first
issue

Black & White Minstrels
"Magic of The Minstrels"

Semprini
"Magic Hour with Semprini"

Palm Court Orchestra/Leopold
"An Evening at The Palm Court"

Shirley Bassey
"Shirley Bassey"

Acker Bilk
"Stranger on the Shore"

Cliff Richard
"Love is Forever"

Eartha Kitt
"Love for Sale"

Joe Loss
"Go Latin with Loss"

Hawaiian Hula Boys
"Hi Fi in Hawaiian"

Russ Conway
"My Concerto For You"

Shadows
"Sound Of The Shadows"

Manuel's Music of the Mountains
"Exotica"

Pepe Jaramillo
"Mexican Fiesta"

Matt Monro
"I Have Dreamed"

Mrs. Mills
"Mrs. Mills' Party"

Silvester Strings
"More Great Show Tunes"

Garry Blake
"Sound Like Swingin' "

Big Ben Hawaiian Band
"Blue Hawaiian Skies"

Norrie Paramor
"Shadows in Latin"

Melachrino
"World's Greatest Melodies"



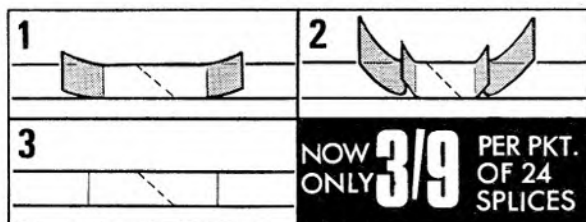
THE GREATEST RECORDING
ORGANISATION IN THE WORLD

E.M.I. RECORDS (THE GRAMOPHONE CO. LTD.) E.M.I. HOUSE, 20 MANCHESTER SQUARE, LONDON W.1.

It's as easy
to edit a tape
as cover a cut—
when you

DRY SPLICE

Dry-Splice is as simple to use as sticking plaster — and in fact that's just how Dry-Splice works. Like sticking plaster, Dry-Splice needs no glue; it can be used at once, there's no waiting to dry. If you've got a splicer already, you can use it to Dry-Splice. But you don't really need it—the free applicator supplied with every pack will do the job perfectly well. Whether you're editing or repairing, you can confidently use Dry-Splice on every kind of tape, to give you a firm permanent join, quickly and easily.



**Get Dry-Splice
from your
usual supplier
or
send for FREE trial**

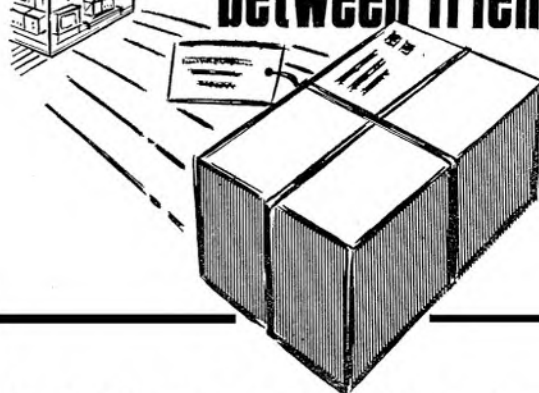
For Free trial supply, send stamped, addressed envelope to
LENNARD DEVELOPMENTS LTD
7 SLADES HILL ENFIELD MIDDLESEX TELEPHONE: KEATS 0601

DRY SPLICE

RE-W



**What's distance
between friends?**

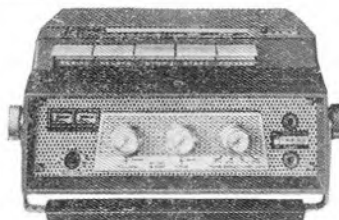


R.E.W.'s fast, friendly and reliable mail order service means that wherever you are in the United Kingdom you can enjoy all the advantages of choosing your tape recorder or hi-fi from one of the widest ranges anywhere, with special emphasis on the superb AKAI range of Tape Recorders and Accessories. All models are available from stock for immediate delivery and on INTEREST FREE H.P. terms over 12 months, one-third deposit.

It means too that you're dealing with mail order experts, specialising in tape recorders and hi-fi and offering you a fast, reliable after-sales service and generous part exchange allowances or cash for your old equipment in sound condition. Send us your enquiry now or ask for literature on Akai or other leading equipment in which you are interested.

AKAI

**Superb Machines with
Professional Performance**

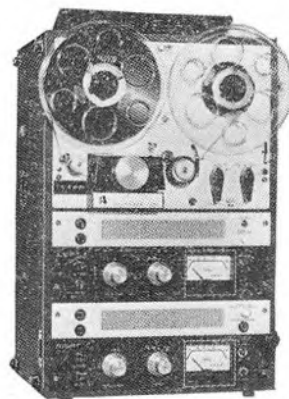


model X4-131 gns

Mains or Battery portable
capable of recording 30-8,000
c.p.s. at 15/16ths i.p.s.

model M8 136 gns

Mono/stereo, 4 track machine with
advanced specification including
vertical stereo speakers.



NEW model 910-62 gns

A new mono tape recorder with
basically the same deck as the famous
stereo models.



REW (Earlsfield) LTD

Dept. T.R.M. 266-268 Upper Tooting Road, London, S.W.17
Telephone: (01) 672/8267 or BAL 9175

*We offer a large selection of shop-soiled and discontinued tape recorders, £9 to £150. Ask for list today.

SLEEP LEARNING AND THERAPY

TIME SWITCHES with large clear 24-hour dial, 3 ons and offs £4-12-6. PILLOW SPEAKERS high intelligibility, only 4" square, matched to impedance of recorders. £3-3-0. ENDLESS TAPE CASSETTES: 15 mins. cycle at 3½ £5-5-0; 10 mins. cycle £3-12-6; 8 mins. cycle £2-17-6. (Double at 1½). INFORMATION & GUIDANCE TAPE (3 gns) covers whole field of Learning and Therapy with demonstrations how to make your own tapes. INDUCTION TAPE No. 1 (3 gns). Vital necessity for use in learning any subject. INDUCTION TAPE No. 2 (3 gns) for therapy. Equally vital where these revolutionary techniques are to be used for removing illnesses, disabilities, personality weakness, etc.

Send now for FREE LITERATURE and FULL LIST with details of the optimum Tape Recorder for the job to:
THE INSTITUTE OF SLEEP-LEARNING
 Dept. TRM, 16 KINGS COLLEGE RD., LONDON, N.W.3. PR1mrose 3314

GLOBAL PRODUCTS

Pre-recorded THEATRE ORGAN Tapes
 Buddy Cole, Harry J. Jenkins, Harold Hunt,
 Stanley Whittington, Jack Helyer, Vic Hammett
 and others. 3½ ips, 2 track.



S.A.E for the list of pre-recorded tapes and accessories

Mail Order ONLY Trade inquiries welcomed
P.O. BOX No. 1, ROTHWELL, Kettering, NORTHANTS

The Berean Forward Movement

(NON-SECTARIAN
 NON-DENOMINATIONAL)

Loan of nearly 1,000 reliable expositions of the Bible available on tape (3½ ips) for cost of postage only (free to the blind and infirm). Invaluable to all Christians, from teachers to tyros; for Bible Study groups or private meditation. Supporting literature also available. Send for free, complete list of tapes and literature to . . .

B.F.M., 22 FILEY ROAD, READING, Berks.

"PIONEERS IN SLEEP-LEARNING"

THE COMPLETE PORTABLE SLEEP-O-MATIC UNIT

Comprising two speed transistorised tape recorder, auto time switch, under pillow speaker and microphone. Price £27 10s., p. & p. 7s. 6d. Batteries 5s. extra. Mains Power Pack 50s. extra.

Specialists in Sleep-Learning and Audio Learning, tapes on Mind Management; Positive Personality; Memory Training; How to Pass Examinations, etc.

Free booklet of the above equipment, list of tapes and discs sent on receipt of postcard.

EDUCATIONAL RECORDINGS LTD.

Dept. T.R.M., 21, Bishops Close, Church Lane, London, E.17

ADVERTISEMENT INQUIRIES SERVICE

I should like further information about

Messrs 's advertisement

on page..... of TAPE Recording Magazine

about..... (product)

NAME.....

ADDRESS.....

November 1966

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

I should like further information about

Messrs 's advertisement

on page..... of TAPE Recording Magazine

about..... (product)

NAME.....

ADDRESS.....

November 1966

I should like further information about

Messrs 's advertisement

on page..... of TAPE Recording Magazine

about..... (product)

NAME.....

ADDRESS.....

November 1966

I should like further information about

Messrs 's advertisement

on page..... of TAPE Recording Magazine

about..... (product)

NAME.....

ADDRESS.....

November 1966

I should like further information about

Messrs 's advertisement

on page..... of TAPE Recording Magazine


about..... (product)

NAME.....

ADDRESS.....

November 1966

ONLY ENGLISH ANNUAL TO DEAL EXCLUSIVELY WITH TAPE RECORDING SEND NOW FOR USEFUL 1966 EDITION

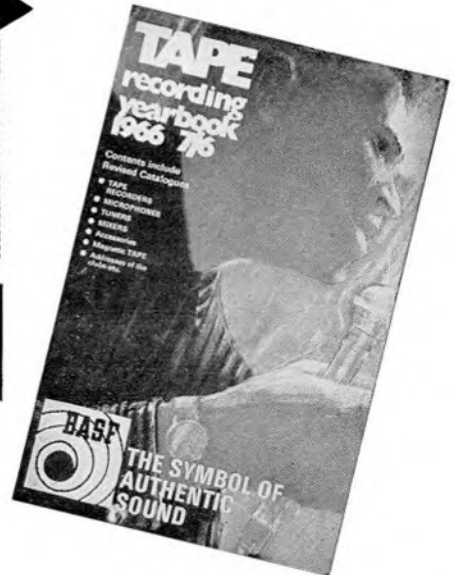
Fill-in & Post this Coupon with Remittance Today! 

To: **TAPE Recording Magazine, 7 TUDOR STREET, LONDON, E.C.4**
 Please send me.....copy(ies) of TAPE Recording YEAR BOOK 1966, at 7s. 6d.
 (U.S.A. \$1.25) per copy POST FREE. I enclose remittance.

NAME

ADDRESS.....

.....



TAPE YEAR BOOK the Recordist's Reference

PRICE
7/6

- ★ The only available up-to-date comprehensive catalogue of **TAPE RECORDERS** on the market with full specifications, price, etc., plus photographs.
- ★ Review of tape developments during the past year.
- ★ Manufacturers, dealers and Club Secretaries' addresses.
- ★ GLOSSARY of technical terms, "at-a-glance" tabulated catalogues of microphones, tuners, mixers, and associated accessories; Magnetic Tape Charts, etc.

On sale at bookstalls or direct from publishers using coupon above

..... CUT ALONG DOTTED LINE

THIRD FOLD HERE

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

BUSINESS REPLY FOLDER
Licence No. ND 922

SECOND FOLD HERE

POSTAGE
WILL BE
PAID BY
PRINT AND
PRESS
SERVICES
LIMITED

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

FLAP B

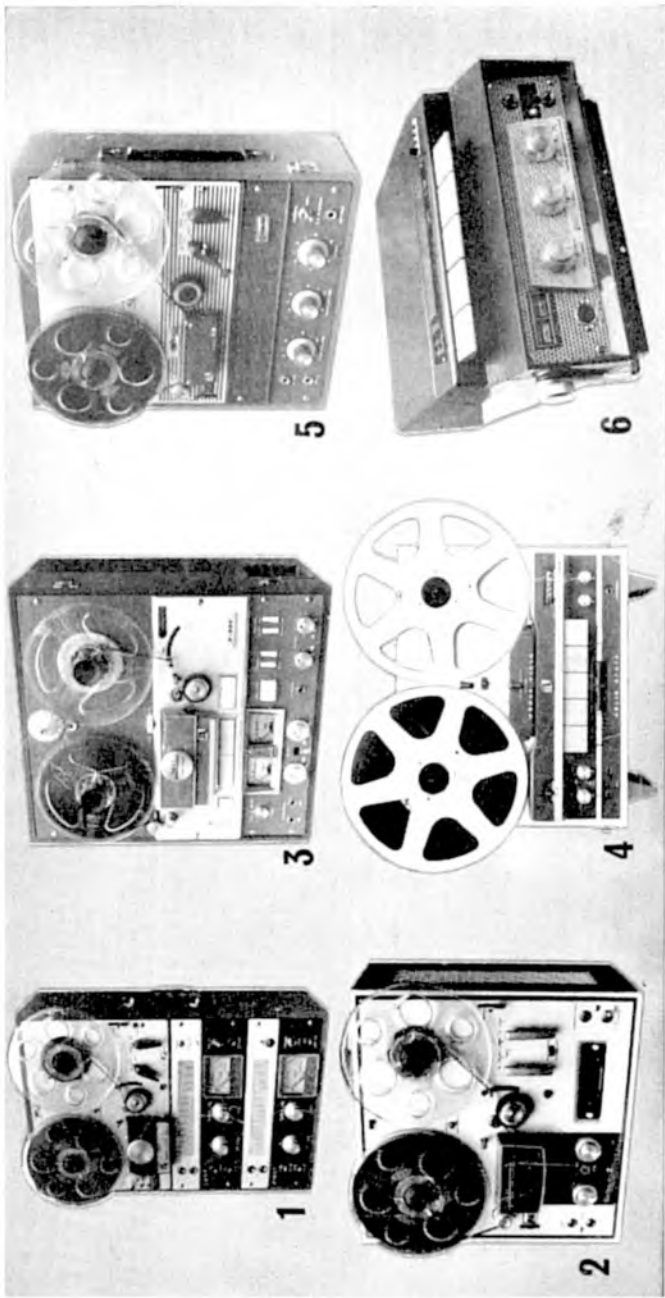
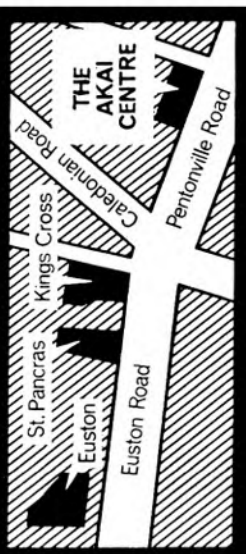
FLAP A

FIRST FOLD ALONG THIS LINE

FLAP B

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

THE AKAI CENTRE



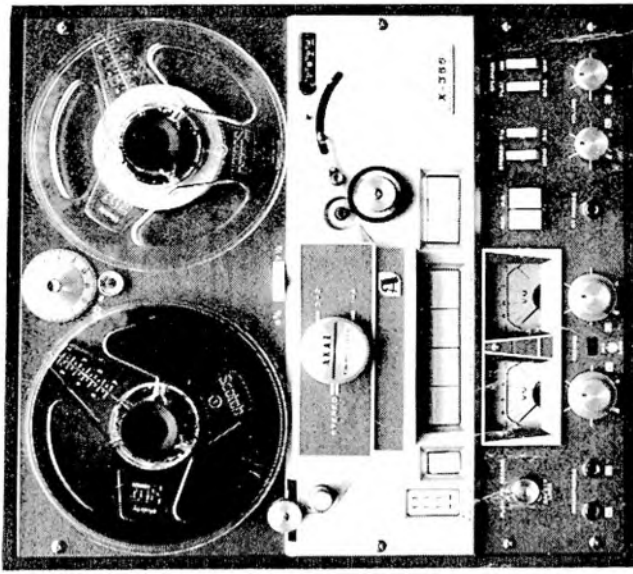
1. AKAI M8
A high quality 4-speed, 4-track stereo/mono recorder with Crossfield head. Vertical or horizontal operation. 4 hours stereo recording on 1200ft. standard tape. 2 stereo fill-in speakers. Sound-on-sound. 6 watts per channel. 136 gns.

2. AKAI 1700
A completely self contained, 3 speed, 4 track stereo/mono recorder. Two 7in. x 5in. built-in speakers, 3 watts per channel. Attractive styling and AKAI precision finish. Takes 7in. reels. 79 gns.

4. AKAI X300
A studio type 3-speed 4 track stereo/mono recorder of professional quality. Fully solid state, 20 watts per channel amplifier. Crossfield heads; 3 hysteresis synchronous motors with direct driven capstan. 10 1/2 in. reels; keyboard controls, and many other features. 190 gns.

5. AKAI 910
A mono recorder, available in four or two track form. Clean and functional styling; two speeds; 3.2 watts output. Built in P.A. system and mixing facilities. 62 gns.

6. AKAI X4
A fully transistorised stereo/mono. battery/mains portable recorder. 4 track; 4 speeds; Crossfield heads; superb low-speed frequency response. Mains-rechargeable battery. 5in. reels. Weighs only 11.2lb. 131 gns.



3. AKAI X355
A machine for the advanced amateur or professional, with 3 motors, 3 speeds, 4 heads (including Crossfield bias) and 20 watts per channel output. Fully solid state; push button solenoid operated controls, automatic reverse, repeat and shut-off functions. Built-in echo chamber effect. Full A.B. monitoring. Remote control facilities, etc., etc. 239 gns.

DEMONSTRATIONS. At "THE AKAI CENTRE" we have on display the complete AKAI range of superb tape recorders, from the amazing stereo AKAI X4 portable to the fantastic AKAI 355. Every model in the fabulous AKAI range is available for immediate demonstration and may be compared with any other make and model available today, for in addition to the complete AKAI range we carry the finest selection of recorders to be seen in this country.

Our expert staff all 100% AKAI enthusiasts are able not only to demonstrate these wonderful recorders but to give you expert advice and technical assistance based upon years of selling AKAI tape recorders. Remember if its AKAI you are interested in then there is only one place to go and that is "THE AKAI CENTRE".

Situated only 100 yards from well known and easy to get to Kings Cross and St. Pancras main line stations, "THE AKAI CENTRE" is one of the most accessible showrooms in London. (See diagram above).

FREE TRAVEL. This is a unique facility offered by "THE AKAI CENTRE". Complete coupon today and send to "THE AKAI CENTRE" for full details of how you can benefit by this unique offer.

Please send me by return a Free Travel Voucher together with full details on AKAI Models.....

Name

Address

Post to: THE AKAI CENTRE
242/4, Pentonville Rd, London, N.1.



THE AKAI CENTRE, 242/4, PENTONVILLE ROAD, LONDON, N.1. Telephone TERMINUS 8200
Open Monday to Saturday 9 a.m. to 6 p.m. (Half day Thursday)

The splendour of stereo
captured as never before



AGFA MAGNETON RECORDING TAPE

You haven't *really* heard stereo ... until you've heard it on Agfa Magneton recording tapes. With perfectly balanced sound reproduction over the complete tonal range, Agfa Magneton

tapes add a thrilling new depth and richness to stereo ... make listening more of a joy than ever. Let Agfa-Gevaert bring the full splendour of stereo home to you.

Agfa-Magneton recording tapes
can be used on all four-track and
two-track recorders.



AGFA-GEVAERT LIMITED

GREAT WEST ROAD, BRENTFORD
MIDDLESEX · Tel: ISLeworth 2131