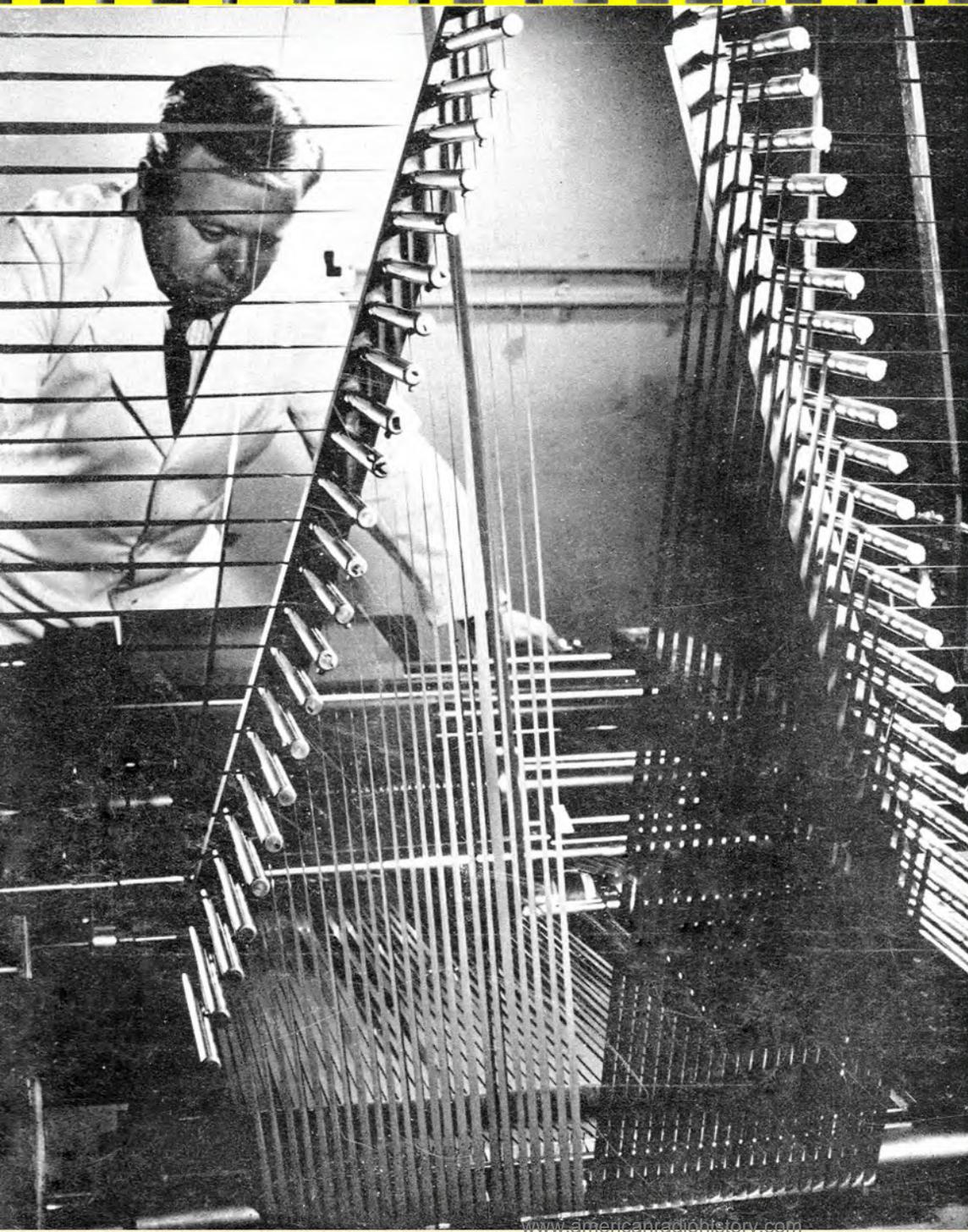


TAPE

RECORDING MAGAZINE

JULY 1965

24



IN THIS ISSUE

● HOW TAPE IS MADE

Special feature on the manufacture of magnetic tape

● MAKING A CONTEST TAPE

ALSO

Travel with a tape recorder

Drama productions on tape

Tape recording Television

Tape records reviewed

New Products

Clubs' News

Tape exchanges

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

Brenell

The tape recorders made for enthusiasts-by enthusiasts

Everyone concerned with the manufacture of Brenell tape recorders is an enthusiast, taking infinite care and patience with each facet of production. Constant research ensures that every possible, worthwhile, refinement is incorporated and that each Brenell machine is built to the stringent specifications laid down. This is why the name Brenell is synonymous with quality and reliability.

Features common to all Brenell models:-

4 tape speeds $1\frac{1}{2}$, $3\frac{1}{2}$, $7\frac{1}{2}$ and 15 ips · 3 Papst outer rotor motors (hysteresis synchronous for capstan drive) frequency correction at all speeds · pause control · monitoring and superimposing · $8\frac{1}{4}$ " dia. reels · fast rewind (1200 ft. in 60 secs.) · all deck switches interlocked · unique, reliable braking system · digital rev. counter hinged decks.

STB 2/5/2



A NEW model—The STB 2/5/2

This versatile mono/stereo recorder has numerous features which will delight the advanced amateur or the professional. Here is a brief specification :-

Especially designed for use with high fidelity stereo installations adjustable attenuators on all input channels to ensure perfect matching with all auxiliary equipment · dual concentric recording level and playback level controls · cathode follower output four channel mixing on mono programme sources · twin recording and twin playback pre-amplifiers · comparison of original and recorded signal · adjustable bias level · recording facilities for $1\frac{1}{2}$ and $2\frac{1}{2}$ track · playback facilities for $1\frac{1}{2}$, $2\frac{1}{2}$, $1\frac{1}{4}$ and $2\frac{1}{4}$ track · sound on sound facilities · two edgewise meters for recording level, tape output level and bias level · optional extra:- stereo power amplifiers and monitoring speakers.

ALTERNATIVE MODEL STB 2/5/1/2 has special deck to accommodate $10\frac{1}{2}$ " N.A.B. reels.

MARK 5 Series 3



Narrow gapped record/playback head for extended frequency response · double gapped ferrite erase head to minimise erase noise · magic eye recording level indicator (meter at extra cost) high quality amplifier (can be used independently of tape recorder) headphone monitoring.

MARK 5 Type M Series 3

All the features of the Mark 5/3 plus:- Separate record and playback heads · separate record and playback amplifiers · recording level meter · mixing of input signals · tape monitoring whilst recording · separate bass and treble controls.

For full details of these recorders write to the sole manufacturers:-

G1D 997

Brenell

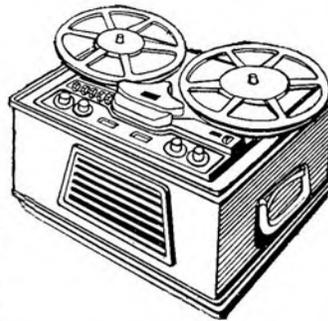
BRENELL ENGINEERING CO. LTD.

231/5 Liverpool Road, London, N.1

Telephone: NORTH 8271 (5 lines)

CITY & ESSEX TAPE RECORDER CENTRES

BRITAIN'S LARGEST TAPE RECORDER SPECIALISTS



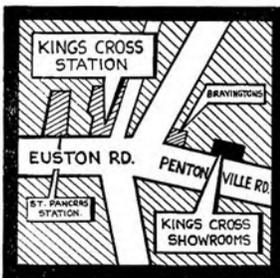
Eight tracks—6 speeds—Video-Stereo-Mono recordings—multiplay — duoplay — superimposing — 6 preamplifiers — 30 watts output per channel—all for under £40. Impossible!! Of course it can't be done. No Manufacturer or Retailer can offer something for nothing. That is why we make no exaggerated claims. Whatever claims we do make are backed by facts!!

We do 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.

- ★ OVER 300 MODELS ON DISPLAY
- ★ EXPERT STAFF, EXPERT ADVICE
- ★ GENEROUS PART EXCHANGES
- ★ UP TO 2 YEARS' FREE SERVICING
- ★ ATTRACTIVE HIRE PURCHASE TERMS

FREE 24-PAGE COLOUR BROCHURE

If you are unable to visit our Showrooms, send for our fully illustrated FREE 24-PAGE COLOUR BROCHURE detailing the wonderful selection of recorders we stock and recommend. Fill in the bottom right-hand corner coupon and post TODAY to our Head Office.



CENTRAL LONDON SHOWROOMS

KING'S CROSS. Situated only 100 yards from KING'S CROSS Main Line Station. These superb showrooms have over 850 sq. ft. of space devoted exclusively to tape recorders. Simply alight at KING'S CROSS Station. Ample parking space outside our Showrooms. See Diagram.

BISHOPSGATE. Almost immediately opposite famous LIVERPOOL STREET Main Line Station and next door to well-known Bishopsgate Institute. Simply alight at LIVERPOOL STREET Station. See Diagram.

NOTE.—Showrooms open Monday—Saturday 9—6 p.m., closed half day Thursday from 1 p.m.

Bishopsgate showrooms only, are closed all day Saturday. Open Monday—Friday 9—6 p.m. Open Sunday 9.30 a.m.—2 p.m.

SPECIALISTS IN

- BANG & OLUFSEN
- FERROGRAPH ★ AKAI
- SONY ★ TANDBERG
- VORTEXION ★ REPS
- REFLECTOGRAPH
- BRENNEL ★ UHER
- REVOX ★ ROBUK
- TELEFUNKEN ★ SANYO
- NATIONAL ★ COSSOR
- PHILIPS ★ AWAAI
- TRUVOX ★ WYNDSOR
- BUTOBA ★ GRUNDIG
- FI-CORD ★ STELLA
- LUXOR ★ STANDARD
- FERGUSON ★ STUZZI
- ELIZABETHAN
- LOEWE OPTA ★ QUAD
- LEAK ★ ROGERS
- ARMSTRONG ★ EAGLE
- SHERWOOD ★ JASON
- CHAPMAN ★ DULCI



- GOODMANS ★ LOWTHER
- KEF ★ WHARFEDALE
- GOLDRING LENCO
- GARRARD ★ DECCA
- PYE ★ ACOS
- RESLO ★ GRAMPIAN
- BEYER ★ LUSTRAPHONE



242/4, Pentonville Road, King's Cross, London, N.1	TER 8200
228, Bishopsgate, London, E.C.2	BIS 2609
2, Maryland Point Station, Stratford, E.15	MAR 5879
205, High Street North, E.6 (Opposite E. Ham Station)	GRA 6543

Please send me your FREE 24-page brochure

Name.....

Address.....

Send to: Citex House, 191, Plashet Road, Upton Park, London, E.13.



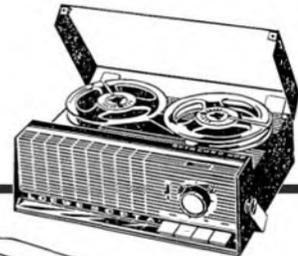
LOEWE OPTA

Hi-Fi Tape Recorders

FOR PERFECTION IN SOUND

THE NEW OPTACORD 408 THE MOST COMPACT MAINS AND BATTERY RECORDER

Single Speed 3 $\frac{3}{4}$ i.p.s. Twin Track. For use on Mains, Batteries and Car Batteries. **39 GNS.**



THE LATEST OPTACORD 416

OPTACORD 416
Specification as Optacord 408 plus dig. counter, tone and volume controls, 2 speeds 3 $\frac{3}{4}$ i.p.s. and 1 $\frac{1}{2}$ i.p.s. Twin Track **51 GNS.**

OPTACORD 416 DIA
As Optacord 416, with built-in Synchronisation for Automatic Slide Projector. **62 GNS.**



THREE-IN-ONE MAINS—BATTERIES—CAR BATTERIES

HIGHGATE ACOUSTICS

Telephone: MUSeum 2901/5

71/73 GT. PORTLAND STREET, LONDON, W.1

Approved Loewe-Opta Stockists

Alexanders, Holburn Street, Aberdeen.	Bristol & Cardiff Tape Recorder Centres.	Gilbert Pianos Ltd., 37, Southchurch Road, South-end.	Joplings Ltd., John Street, Sunderland.	Piercy's, 60-62 Lupus Street, S.W.1.	G. H. Steel, 141, St. Georges Road, Glasgow.
I. J. Allen Ltd., The Quadrant, Bournemouth.	A. Brown & Son Ltd., 24/28, George Street, Hull.	Grimes Ltd., King Street, Wigan, Lancs.	Kendal Milne & Co., Deansgate, Manchester 3.	Rackhams Ltd., Corporation Street, Birmingham 2.	Tape Recorder Centre, 82, High Holborn, W.C.1.
Arding & Hobbs Ltd., Clapham Junction, S.W.11.	Brown, Muff's Bradford, 1.	Guildhall Tape Recorders, 33, Guildhall Street, Folkestone.	John King (Films) Ltd., Film House, East Street, Brighton, 1.	Recording Machines Ltd., 119, Victoria Street, S.W.1.	Tape Recorder Centre, 30, King Cross Street, Halifax.
Audiocraft, 20, Kettering Road, Northampton.	Camera Thorpe, 6/8, Osmaston Road, Derby.	J. E. Hargreaves Ltd., 1, Railway Road, Blackburn.	R. S. Kitchen Ltd., 22, King Edward Street, Leeds, 1.	Tom Reckie Ltd., 10, Bridge Street, Stafford.	J. H. Tate & Co. Ltd., 45, Crowtree Road, Sunderland.
Barkers Ltd., 31, Oxford Road, Worthing.	Campkins Audio, 21, Market St., Cambridge.	Harveys, High Street, Guildford, Surrey.	Lancashire Hi-Fi Ltd., Tape Centre, 8, Deansgate, Manchester 3.	REW Earlsfield, 266, Upper Tooting Road, S.W.17.	Tele-Sales & Service Ltd., 9, Alexandria Drive, St. Annes, Lancs.
Barretts of Canterbury.	Chelsea Record Centre, 203, Kings Road, S.W.3.	Hamilton Electronics, 35, London Rd., Southampton.	Leech & Haige Ltd., 112, London Road, Oxford.	Ryland Huntley, 15, Old Bond Street, Bath.	Teletape, 33, Edgware Road, W.2.
Battys (Rhyl) Ltd., Rhyl (Tel.: 2621).	Chiesmans Ltd., Lewisham, S.E.23.	J. Harris, 231, Baker Street, N.W.1.	Massey's 121/3, High Road, Chiswick, W.4. CHI 2082	Selfridges Ltd., Oxford Street, W.1.	The Recorder Co., 188, West End Lane, N.W.6.
Wilf Plant, Asfordby, Melton Mowbray Leicester.	City & Essex Tape Recorder Centres, 228, Bishopsgate, E.C.2.	House & Son Ltd., Blake Street, York.	James McKenzie Ltd., Grange Road West, Birkenhead.	Sheen Tape Recorder Centre, 8, Station Parade, Sheen, S.W.14.	Turners Photographic Ltd., 9, The Walk, Ipswich.
Bon Marche, Northgate Street, Gloucester.	Courtney Davies, 12, Station Road, Harpenden.	Howard Tape Recorders, 218, High Street, Bromley, Kent.	Misons, Hi-Fi Specialist, Citadel Row, Carlisle.	Sheffield High Fidelity, 10, West Street, Sheffield, 1.	Radio Maintenance, (Leicester) Ltd., 111, Queens Rd., Leicester.
Leonard Booth, 35, South Street, Eastbourne.	Croasdales (Nelson) Ltd., 41 & 58, Every Street, Nelson, Lancs.	R. H. O. Hills Ltd., Bank Hey Street, Blackpool.	Fairbotham & Co. Ltd., 58-62 Lower Hillgate, Stockport, Cheshire.	J. Smith & Sons, 184, The Rock, Bury, Lancs.	Lloyd & Keyworth, 26, Downing Street, Farnham.
Bourne Radio, 4, Albert Road, Bournemouth.	Dingles, Royal Parade, City Centre, Plymouth.	Imhofs Ltd., New Oxford Street, W.C.2.	Aldridges (Music) Ltd., 14/16 Hoghton Street, Southport.	Stanwood Radio Ltd. (All Branches.) London-Essex-Herts-Suffolk.	Bristol-Hi-Fi, 28, Upper Maulding Street, Bristol.
LOEWE OPTA	Francis of Streatham, 169, Streatham High Road, S.W.16.	Jones & Higgins, 1-41, Rye Lane, Peckham, S.E.15.	Parish & Co., 130, Union Street, Torquay.	Sport & Radio, 26/29, Aldwich Road, Bognor Regis.	J. W. Mansfield, 18, Liverpool Road, Worthing



YOU SAID IT!
 (played it, sang it!)
NATIONAL
 HAVE IT TAPED
 SUPERBLY!

Just say the word – and it starts!
 You stop, and the recording stops,
 too! The National RQ-150 is the
 first completely automatic Voice-
 operated portable tape recorder in
 the world.

And this is only the beginning—the incomparably versatile RQ-150 also provides automatic slide and film synchronisation, automatic threading and remote control. If you really want to spread the word, there's a Public Address System that permits accurate monitoring through a built-in loudspeaker while recording. All this and *immaculate* reproduction, too!

SPECIFICATION

- Power Source:** 6 unit cells (U.2.), 9 V.
- Output:** 500mW (700mW max.)
- Transistors:** 9 Transistors, 1 Thermistor, 1 Diode.
- Tape Speed:** 3½ i.p.s., 1½ i.p.s.
- Frequency Response:** 100-7,000 c/s at 3½ i.p.s., 100-4,000 c/s at 1½ i.p.s.
- Recording Level Indicator:** VU meter.
- Speaker:** 3½" Permanent Dynamic Speaker.
- Dimensions:** 3½" x 9" x 12½".
- Weight:** 5 lb. 14½ oz.
- Accessories:** Dynamic microphone with remote control switch; 5" recording tape (600 ft.); 5" empty reel; radio cord; leather case for accessories; hand belt; splicing tape; sensing tape; plug for slide sync.; magnetic earphone.



RQ-303

Also from NATIONAL:

- RQ-303, Mains 2 track, single speed.
- RQ-101s, Battery*, 2 track, 2 speed, plays any 3" tape.
- RQ-115, Battery*, 2 track, 2 speed.
- RQ-116, Battery*, 4 track, 2 speed.
- RS-753, Mains, full stereo, 4 track, 3 speed.

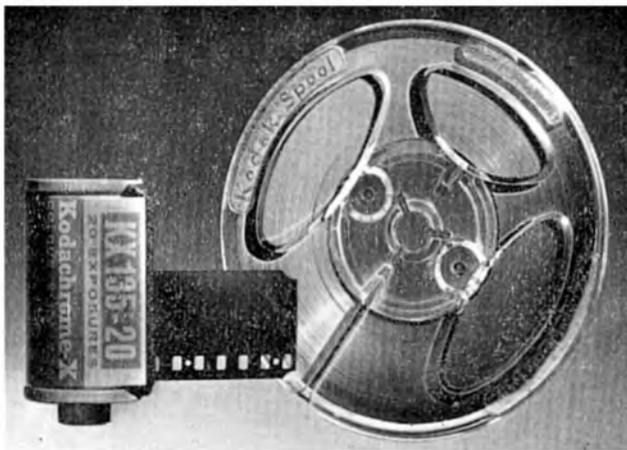
**With optional mains adaptor available*

Full details of these tape recorders are readily available from your nearest NATIONAL dealer or from UNAMEC, P.O. Box 1, United Africa House, Blackfriars Road, London, S.E.1.



**TAPE
 IT
 EASY—**

with NATIONAL,
 naturally!



How Kodak's film-coating skills set today's highest standard in tape

Kodak know a lot about surface coating. More than any other manufacturer in the world, in fact. This isn't really surprising, because one of the reasons for the unrivalled high quality of Kodak colour films is the unique evenness of their emulsion coatings.

Now, Kodak have applied these advanced coating skills to the manufacture of sound recording tape. The result is a tape whose magnetic oxide layer is accurate to within *millionths* of an inch. No wonder that sound recording engineers all over the world have acclaimed it as the finest tape ever made.

Play it as soon as you can. You'll be getting a higher signal-to-noise ratio, better frequency response, a remarkable freedom from drop-out and print-through, and above all, a *total* uniformity in performance.

There's a Kodak Tape for every recorder, of course, including the world's only Quadruple Play tape, for use with battery portables (5½ hours playing time on a single 3¼" reel!). So next time you buy tape do the sensible thing and specify Kodak Tape. It will do full justice to your equipment. And it costs no more.

Kodak sound recording tapes ... the best tapes in the world

© Famous Kodak Company MEMPHIS



Post this coupon today.

Please send me full details of Kodak Sound Recording Tapes.

NAME

ADDRESS

.....

Kodak Ltd., Dept. 70, Kodak House, Kingsway, London, W.C.2

2

You're guaranteed a better deal when you

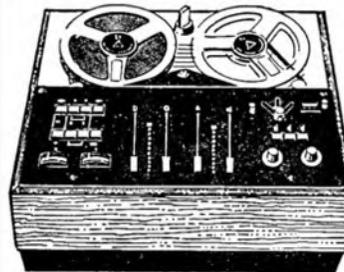
PART EXCHANGE

your
TAPE RECORDER or
HI-FI EQUIPMENT

with R·E·W

A friendly welcome awaits you at our recently extended showrooms where you will find a large array of fine equipment at all price levels. With a comprehensive service geared to your personal satisfaction we can provide generous part exchange facilities, immediate delivery and—if you cannot visit us—a fast and friendly Mail Order Service. Remember, your guarantee of a better deal is in the name and reputation of R.E.W. (Earlsfield) Ltd.

MACHINE OF THE MONTH



B & O BEOMASTER 2000

ALL TRANSISTOR STEREO TAPE RECORDER. Two or Four Track.

In teak 112 gns. or £17 12s. deposit and 12 monthly payments of £8 6s. 8d., with detachable speakers 117 gns. or £20 17s. deposit and 12 monthly payments of £8 10s. Latest version of the B & O Stereomaster, with built-in mixing panel for simultaneous mixing of three input signals. The ideal machine for the really discriminating amateur, built to a comprehensive professional specification.

Bargain Basement!

We have an unrivalled stock of leading makes of new and used machines at unbeatable bargain prices—30%-60% reductions on original prices! Make a point of asking for our Special Bargain List.

You're guaranteed maximum satisfaction with the R·E·W

"PLUS FIVE" SERVICE

- ★ Generous part exchange allowances.
- ★ No interest terms—lowest deposits.
- ★ Off-the-Shelf delivery from the biggest range under one roof.
- ★ Free servicing and free delivery.
- ★ Optional personal insurance.

INTEREST FREE TERMS!

Take your pick from our wide range and have any machine you want for 10% deposit, balance twelve months and no interest charged. (18-24 months H.P. terms also available). OPTIONAL INSURANCE at nominal rates against Unemployment, Sickness or Accident during term of H.P. Agreement. Premium 6d. in £—gives cover over 2 years.

▶ LOWEST DEPOSITS

▶ CASH for YOUR TAPE RECORDER or HI-FI
Highest cash offers for good equipment . . . get in touch today!

Home demonstrations in the London area gladly arranged by return enquiry service. Agents for all makes.



R·E·W

(EARLSFIELD) LTD.

Mail Order Department
266/268 (TRM) Upper Tooting Road,
London, S.W.17
Telephone: BALham 9174-5

Ferrograph

SERIES 6



SERIES 6 FEATURES

NEW CASE STYLE

Combines clean design with added strength and durability.

THREE OPERATIONAL SPEEDS

1 7/8, 3 3/4 and 7 1/2 i.p.s., 3 3/4, 7 1/2 and 15 i.p.s.

SYNCHRONOUS BALL-RACE CAPSTAN MOTOR

Extremely smooth running. Designed to give long maintenance-free service.

MODEL 631 1 7/8 3 3/4 7 1/2 i.p.s. monophonic **88** gns.

MODEL 631H 3 3/4 7 1/2 15 i.p.s. monophonic **92** gns.

MODEL 632 1 7/8 3 3/4 7 1/2 i.p.s. stereophonic **115** gns.

MODEL 632H 3 3/4 7 1/2 15 i.p.s. stereophonic **120** gns.

The "Manual of the Ferrograph"—a fifty-page, fully bound volume—is made available at the cost of £1. As well as detailed information on recording techniques available with the Ferrograph it contains technical information, circuitry and component parts lists. When you purchase a Ferrograph the cost of the manual will be refunded to you.

THE FERROGRAPH CO. LTD.

84 Blackfriars Road, London, S.E.1.

Please send me a copy of the "Manual of the Ferrograph" for which I enclose £1.

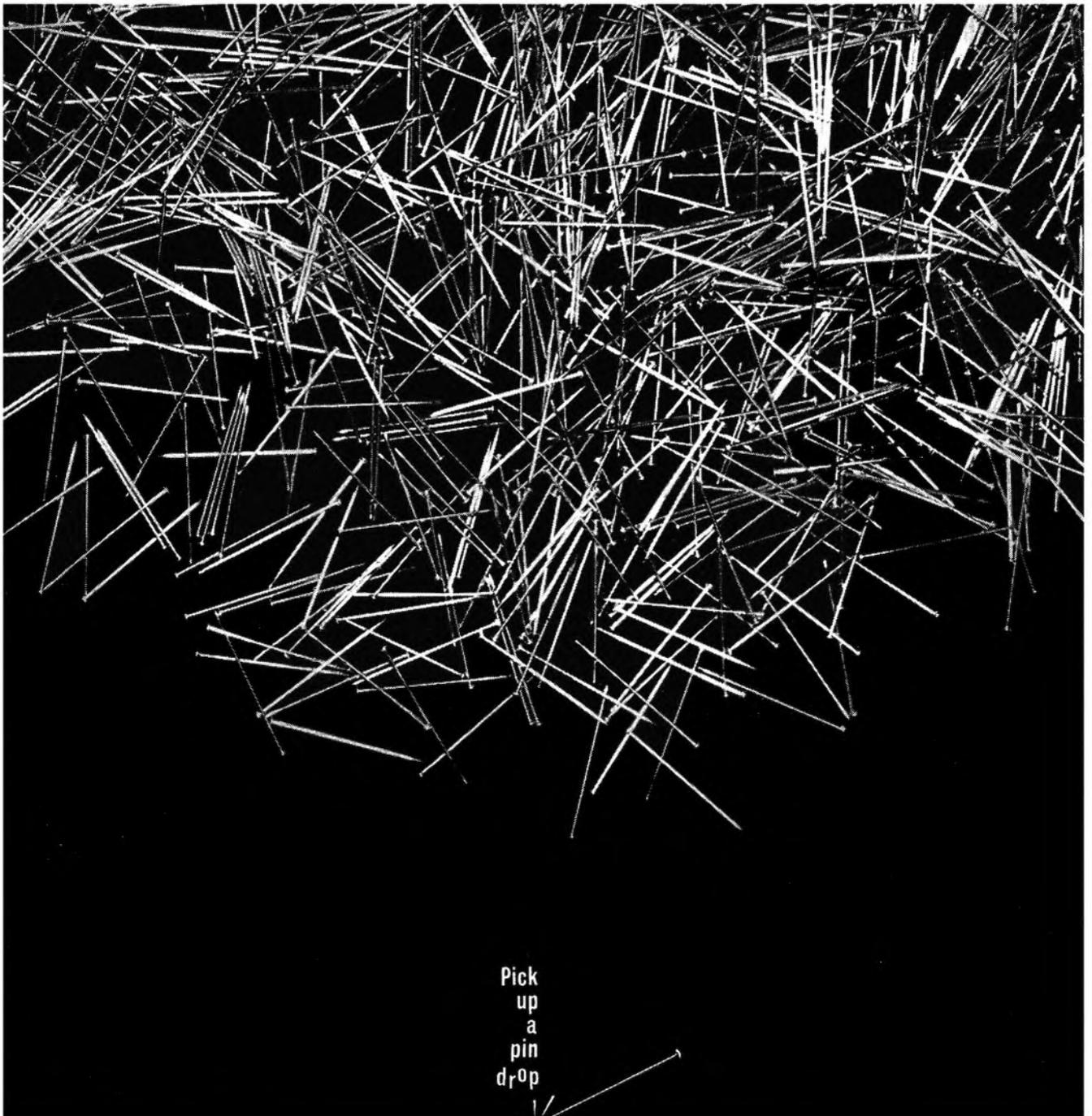
Please send me a copy of the free Ferrograph leaflet.

NAME.....

ADDRESS

.....

TRM-2



Pick
up
a
pin
drop

All critics agree that perfect sound reproduction depends on the lack of distortion in the microphone signal

$$PSR = LOD = Reslo *$$

With a Reslo microphone you can prove this equation.

* PSR = Perfect Sound Reproduction LOD = Lack of Distortion



RESLOSOUND LTD

24 Upper Brook Street, W.1
TKM/4/65

Telephone HYDe Park 2291

THE WHARFEDALE SUPER RANGE

Each loudspeaker in this range is fitted with roll surround for low resonance and double diaphragm assembly for extended HF response.

SUPER 8/RS/DD

Impedance 10/15 ohms
Ceramic Magnet
Flux density 14,500 oersteds
Total flux 60,000 maxwells
Aluminium voice coil
Max. input 6 watts rms or 12 watts peak
Frequency range 40-20,000 c/s.
Bass resonance 50/60 c/s.
Price 134/2 inc. P.T.

SUPER 10/RS/DD

Impedance 10/15 ohms
Flux density 16,000 oersteds
Max. input 10 watts rms or 20 watts peak
Frequency range 30-20,000 c/s.
Aluminium voice coil
Bass resonance 38/43 c/s.
Price 218/8 inc. P.T.

SUPER 12/RS/DD

Impedance 12/15 ohms
Flux density 17,000 oersteds
Total flux 190,000 maxwells
Aluminium voice coil
Max. input 20 watts rms or 40 watts peak
Frequency range 25-20,000 c/s.
Bass resonance 26/32 c/s.
Price 350/- (no tax)



Write for informative and fully illustrated 12-page Booklet



Wharfedale

WHARFEDALE WIRELESS WORKS LTD.
IDLE · BRADFORD · YORKSHIRE
Tel: Idle 1235/6 Grams: "Wharfedel" Bradford

When writing for Wharfedale Booklet, please quote Dept.M.

TAPE

RECORDING
MAGAZINE

Vol. 9

No. 7

July 1965

IN THIS ISSUE

Tape trends and tape talk	266
<i>By the Editor</i>	
Tape contest at Oxford	267
<i>Geoffrey Hodson</i>	
FOCUS on magnetic tape	268
<i>Bill Jay</i>	
Making a contest tape	269
<i>Ron Tucker</i>	
Dramatape Miscellany	271
<i>By Perspective</i>	
Stereophile at large	272
<i>John Cordeaux</i>	
Tape recording television	274
<i>John Valentine</i>	
Letters to the Editor	277
Alan Edward Beeby	279
Test Bench	280
<i>Clarke & Smith 634</i>	
Tape records reviewed	282
<i>Edward Greenfield</i>	
Jazz on tape	282
<i>Mike J. Gale</i>	
New Products	284
News from the clubs	287
Tape Exchanges	287
Advertisement Inquiries Service	289

COVER PHOTOGRAPH: Magnetic recording has progressed considerably since the invention of plastic, and the eventual use of plastic tape as a base for an oxide coating. Our frontal illustration this month shows one of the more intricate stages of manufacture. Immediately after being slit into quarter-inch widths, the tape is threaded through these rollers on to large spools situated just out of the photograph on right and left. A description of tape manufacture is given in the article on page 268 of this issue.

"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

ADVERTISING

LUDgate 9088

Editor,
R. DOUGLAS BROWN

Assistant Editor,
FRED CHANDLER

Tape trends and tape talk

By the Editor

THIS YEAR'S BRITISH Tape Recording Contest has achieved a record entry. The efforts of the leading firms in the tape manufacturing and marketing field, the co-operation of dealers and the increased publicity have introduced the Contest to a wider audience and, I hope, encouraged more creative activity with tape recorders than at any time in the past.

Perhaps as important, contacts have been made in recent months which promise an even greater extension of the Contest in the future.

Now to the judging. The Organising Committee, on which all the leading firms are represented, has this task in hand. In the weeks immediately ahead each tape will be heard and a preliminary selection will be made.

Then the best tapes will be submitted to the judging panel of distinguished tape recording experts meeting in the Mullard Theatre on July 28. They will make the final selection.

The majority of this year's entries are in the category for amateurs. But a number of novices, with less than a year's experience of the hobby have been tempted to try their skill and luck. And a few professionals have entered in the new class for them introduced for the first time this year.

The same number of silver cups, trophies and other awards as in previous years will be allocated by the judges to the best tapes. Though the classifications may vary somewhat to past Contests, the chances of a major award are unaffected.

But the Organising Committee has agreed that the Federation of British Tape Recording Clubs—which is responsible for the British entries in the International Contest, in October—may consider as British entries any of the tapes entered in the British Contest.

With the International Contest (CIMES) staged in London this year, for the first time since 1958, a strong British entry is desirable.

Organisation of CIMES goes forward well. The judging

sessions will take place at Broadcasting House. It is understood that the government will give its blessing to the event. The International Federation of Sound Hunters will hold its annual congress at Church House—where the necessary simultaneous translation facilities are available.

And it is hoped that a full social programme can be arranged, comparable to the generous hospitality which other nations have offered when they have played host to this international event.

* * *

INTERNATIONAL EXCHANGE OF message tapes is one aspect of recording activity which shows continued healthy expansion. A glance at our "Tape Exchanges" feature this month is informative.

One of the tape-spondents seeking contacts in other parts of the world is nine-year-old Antony Eyre, of Derby, surely the youngest-ever fan to take this hobby thus seriously.

And others seeking contacts through our columns this week write to us from South Africa, Australia, Japan, Rumania, several parts of America, and from several British Army units overseas. It is not only a good indication of the spread of the hobby: it is also an interesting reflection of the world-wide readership of this magazine.

The Voicespondence Club, which specialises in this tape exchange activity, publishes in the current issue of its magazine a photograph of a station wagon delivering to its H.Q. five sacks of mail—a normal day's post. The Americans have been the pace-setters in this field and I would say that it is the most successful form of tape activity, in terms of numbers taking part, anywhere in the world.

Something phoney*

A RESIDENT OF READING recently answered the ringing of his telephone:—

"I am a Post Office engineer," a voice told him, "and we are carrying out tests on a number of lines in this area. Would you be good enough to co-operate with us?"

"Certainly," the man replied. "What do you want me to do?"

"Count one to ten slowly, and in a deep voice—we are checking first on the lower frequencies."

The man did as requested.

"And now," said the voice, "will you repeat that, but make your voice as high as you can?"

At this the man protested. He did not mind helping, he said, but this was ridiculous. The voice appealed to him to continue the tests; they were nearly through now, it said, but the high frequencies obviously had to be checked as well as the low.

So he counted up to ten in a falsetto voice.

"Now, one last request—will you sing 'Annie Laurie' for us?"

At this, the man exploded. Was the Post Office trying to make a fool of him, he demanded to know? And so forth. But the persuasive voice finally pacified him, and with great reluctance and under protest, the man rendered "Annie Laurie" to the best of his ability. He was thanked profusely for his co-operation.

Next day he had a visit from his brother-in-law.

"I'd like you to hear a tape recording I made yesterday," said he.

* Reprinted from "Philips Forum"

LAUGH WITH JEEVES



"Stop worrying, you said it was a mains recorder."

Oxford Recorded Cuppers Contest 1965

SPECIAL REPORT BY GEOFFREY HODSON

FIRST prize in the annual Recorded Cupper Contest organised by Oxford University has been awarded to Jeremy Gibson of Hertford College. His tape, "Mushrooms" was a most distinguished entry which really exploited the medium of sound.

The winner had included a variety of voices and acoustics for quotations from the poem "Prayer before birth" by Louis MacNeice which formed the springboard of his script.

Much can be learned from this tape for those thinking about entering other tape contests. The producer had considered his subject for almost six weeks and recorded it in two days.

The theme concerned the Law Court confession of some future USA President who had destroyed China and the USSR in three minutes. It could have been very funny, but it wasn't because it sounded sincere. Beautifully and simply spoken, "Mushrooms" included spontaneous comments from interviews with other members of Hertford College: all economically chosen. The *ad lib* effect was obtained by the actor using his script to provide only the main outline of his speech. He improvised the rest.

Each speaker used the microphone skilfully, remembering that it stands *in loco* for the human ear, and treating it accordingly.

The Contest had attracted only six entries this year, but every tape had tried to say something in sound. Apparently in previous years, a number of entries had been merely recorded play readings. As the contest was originated by the Oxford University Drama Society in 1958, this is perhaps not so surprising.

Three years ago, the contest was taken over by the University's Broadcasting Society. This year's president is Nigel Rees, who as a fourteen-year-old schoolboy, was a section winner of the British Amateur Tape Recording Contest. His

influence was clearly at work in the variety of items offered in this year's competition.

Several useful points were revealed by the Oxford entries. One basic rule: make sure that the entry begins immediately after the leader tape. There were nearly five minutes of unidentified music before one Oxford entry. And if you are using a four-track machine, make sure that the other three tracks are clean. It was never discovered how one Oxford tape ended as music—played backwards at double speed—burst in. It is also advisable to use a new tape for preference, and tidy it up by putting a red trailer at the end of the recording.

Every tape, like every radio and television programme can be looked at in three parts: subject, treatment, and execution (both technical and artistic). As Peter Bastin wrote in the March issue of *TAPE*, the big problem is what to do, but other problems follow once that decision has been made.

The early history of recorded sound and broadcasting alike revealed them both on the whole as bastard art forms. It is not enough to stick up a microphone in a given situation and hope for the best. Radio has learnt this, and so had the six Oxford entrants.

What five of them had not completely absorbed was the fact that the microphone does demand a special technique. Bernard Shaw was chastising politicians over thirty years ago for addressing the microphone like a public meeting. A number of amateurs have still to learn this lesson.

Looking at the Oxford entries in more detail—Barney Powell of Christ Church demonstrated fertility as a writer in two tapes. "On Time" was a microphone adaptation of his own one-act play for the stage. Set in a railway station waiting room, all sound effects had defeated them except a very loud door, but all the

characterisations were individual both in the writing and casting. Only one performance really stood out, however, and this demonstrated the virtue of an actor taking his time. The author certainly needed to do this in another part, for his rapid and swallowed speech failed to do justice to some good lines. With no sound effects to help the atmosphere and very little action in the plot, "On Time" was far from perfect, but it had its moments, particularly in the writing.

"Ten Days in Another Country" was Barney Powell's second offering—an eleven minute talk on a tour of Ireland. Comparisons with Dylan Thomas were inevitable and a little unfair, because he did paint some very fine word pictures that worked all the senses. The humour was true and Irish. The swallowed speech and the voice that was a shade too projected detracted on the presentation side.

Merton College was very reluctant to send in its tape because of the indifferent technical quality. Fortunately they did, and they posed some interesting problems as a result. For their subject they chose "Generation X," a reasonably well-known sociological book consisting in part of transcriptions of tape recorded interviews with teenagers. The readers just couldn't lift the speeches off the printed page, and instead of realism the effect was partly send up. This was back to square one with a vengeance. The subject matter was excellent and the treatment *suggested* by the book the right one. But it was wrong to read other people's words. Far better to go out and get your own recordings and comments. People will talk for you.

St. Peter's College dared—and got away with it, that is until the music, played backwards and at double speed, cut off the ending. William Shakespeare "the theatre personality of 1964" was subjected to a BBC interview. Dangerous ground, but the script writer had been deft with his selection of true Shakespeare quotes and the performance of the interviewer hit the right plummy and verbose note from the beginning so there was humour and no embarrassment. "For this relief, much thanks" was a sure-fire hit on W.S.'s return from the loo, but no quote could be found to get him there. What about "Where the place?" (Macbeth)!!

The best technical quality of the evening came from St. John's College. Ferrograph of course, Simon Taylor chose John Steinbeck's story "The Raid." Now here was a real problem of treatment. A single reader? A full dramatisation? Taylor took the middle path—and the consequences. This was first-class storytelling by a narrator, and two fine performances by real Americans. From the

(Continued on page 283)

THE MANUFACTURE OF MAGNETIC

TAPE

BILL JAY* describes the preparation, manufacture and design of magnetic recording tape as used in the domestic range of recorders

WHOEVER said "if you would discuss with me, first define your subject" was quite correct. So right from the start let us get clear in our minds exactly what we mean by magnetic tape.

All magnetic recording materials in general use have a flexible base material which remains dimensionally stable and forms a support for the magnetic coating. Because of this, most finished products are in the form of a roll mounted either on a core or a spool and, on unwinding, display one shiny side (the base material) and a matt brownish-red side (the oxide coating).

One of the greatest advantages that magnetic recording systems have over all other techniques is that the recorded signal is immediately available for reproduction without further processing—it gives *instant playback* once the tape has been re-wound to the "start" position.

Magnetic recordings can be reproduced many times without distortion and can be stored indefinitely under a wide range of humidity and temperature conditions.

We will concentrate in this article on magnetic tape, there is also of course magnetic film, and in particular on the type of tape used with domestic tape recorders. Tape is available in four thicknesses, $\frac{1}{4}$, $\frac{1}{2}$, 1, or 2-inches in width. The base materials used for audio recording tapes are usually diacetate, PVC or polyester.

Let us take an even closer look at the beginnings of both base and oxide coating.

HOW BASE IS MADE

In the case of acetate bases, which are commonly used for tape, the starting point in their manufacture is the preparation of a "dope." This is a very viscous solution made from a mixture of cellulose triacetate "flake" (a coarse white powder formed by the interaction of cotton linters, acetic anhydride and acetic acid), methylene chloride and methanol (a solvent), together

with a non-volatile softening material such as triphenyl phosphate (a plasticiser).

The dope is fed evenly onto the specially prepared surface of an endless copper band, which is completely enclosed in an electrically heated tunnel. The solvents are driven off into a recovery plant and the liquid dope becomes a film layer capable of being stripped from the band. After seasoning and subbing (adding an extremely thin coating to help the oxide to adhere to the base), the film is rolled into lengths, (never less than 1,000 ft.), and packed in dustproof wraps ready for despatch to the coating works.

FACTS ABOUT TAPE BASE

Diacetate base is used for "Standard Play" tapes. It is usually 0.0015 inch in thickness. 1,200 ft. can be accommodated on a seven-inch spool to yield a playing time of 64 minutes at a tape speed of $7\frac{1}{2}$ inches per second.

PVC base, usually 0.0015 inch in thickness, is also used for "Standard Play" tapes. Again, 1,200 ft. can be accommodated on a seven-inch spool to yield a playing time of 64 minutes at a tape speed of $7\frac{1}{2}$ inches per second. PVC base has a greater tensile strength than diacetate and it

Polyester base is also used for Triple and Quadruple tapes. It must be appreciated that as the thickness of the base is reduced so is the tensile strength, so this tape is more liable to stretch under tension. Also, with reduced separation between one oxide layer and the next when the tape is in the roll form, the risk of "print-through" is greater.

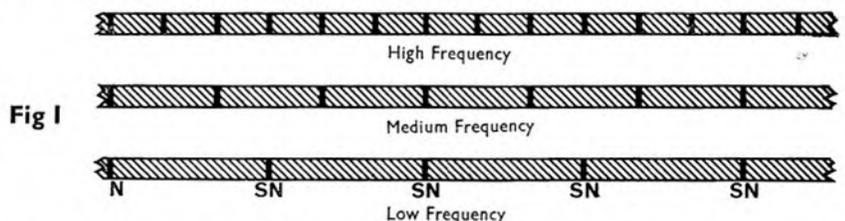
All the playing times shown above are calculated for dual-track recorders. The playing times for single-track recorders are half those quoted.

The various types of plastic materials used for recording tapes—diacetate, PVC, polyester, and triacetate—are chosen for many reasons, but particularly for the thickness necessary to maintain a minimum strength and to yield a given playing time for a standard roll size.

As the tape base thickness is decreased (in order to provide a longer playing time for the same spool size) so the base material must be changed to preserve the required minimum strength and freedom from distortion.

HOW THE OXIDE IS MADE AND COATED

The major basic constituent of most magnetic sound recording materials is carefully prepared ferric oxide (Fe_2O_3). This is ground



is not affected to the same extent by changes in temperature and humidity. Because of these physical advantages professional recordings are usually made on PVC standard tapes.

Polyester base is used for "Extra Play" tapes, 0.0010 inch in thickness, 1,800 ft. can be accommodated on a seven-inch spool to yield a playing time of 96 minutes at a tape speed of $7\frac{1}{2}$ inches per second.

Polyester base is also used for "Double Play" tapes, usually 0.0005 inch in thickness. 2,400 ft. can be accommodated on a seven-inch spool yielding a playing time of 128 minutes at a tape speed of $7\frac{1}{2}$ inches per second.

to an extremely small particle size in a special ball-milling operation. The highest frequency which can be recorded on the final tape is emitted by the smallest magnetic particle size. Solvents are added to produce an oxide coating lacquer.

The preparation of both the ferric oxide and the lacquer, as well as the degree of dispersion of the oxide in the lacquer, are rigidly controlled to ensure that the tape meets high technical standards, particularly as regards low modulation noise level and increased HF sensitivity.

The ferric oxide lacquer is coated onto the plastic base with extreme precision and to a thickness which must remain between 0.00048-0.00052 inches. This very high

* of Ilford Limited.

accuracy of coating thickness is essential to prevent any variation in signal play-back volume level.

It is also essential that the coating remains free from drop-outs and drop-ins. Drop-outs are holes in the coating which result in a loss of recording. Drop-ins are small bumps or foreign particles in the coating which could damage the recording equipment.

At the moment of coating the magnetic oxide lacquer is in a fairly liquid state. It soon begins to set but, before it is completely dry, the coated material is passed over a strong electro-magnet. The purpose of this stage is to give an improved signal strength. This is achieved by orientating the oxide particles so that they set in the lacquer with their longer dimension parallel to the direction in which the tape travelled through the coating machine.

This line-up can never be perfect, but it does result in a greatly improved signal strength.

So a magnetic coating can be described as a vast series of very small bar magnets aligned head to tail along the tape. During recording the coated side of the material is passed in contact with the recording head (or the erase and replay heads). As the polarity of the recording head is constantly alternating at audio frequencies this causes these bar magnets to become permanently magnetised in a pattern which coincides with the alternative polarity of the recording head.

Naturally the highest frequency which can be recorded is limited by the magnetic particle size. Lower frequencies are recorded by several particles acting as one and, in effect, becoming longer bar magnets, as shown in Fig. 1.

Note that, in the low frequency, the polarity of each bar magnet has been indicated—"N" indicates the north polarity and "S" the south polarity. One must remember that an alternating current is passing through the recording head—so one side of the recording gap (or one pole in the head) will exhibit maximum north polarity at the peak of a pure wave form but, half a cycle later, the same side of the gap will exhibit maximum south polarity. Because of this magnetic polarity of the particles throughout the tape will also alternate. This simple analogy can only be related to the recording of a pure note. The condition when speech or music is recorded (involving many combinations of frequencies and harmonics) is extremely complex.

After coating and drying, the film is slit to its final width on special slitting machines which ensure high width accuracy.

All Ilford Zonatapes are electrically examined before they are rewound onto spools.

Coloured leaders and stop strips are added to complete the tapes which are then packed into storage boxes for spool protection and ease of reference.

This, in a nutshell, is how magnetic recording materials are made—to unravel all the details of this extremely complex manufacturing process would of course take far more space than we have available here. And, although we have only mentioned magnetic tape in general terms, include magnetic film and there are many different variations on these basic groups—such as fully coated, coated between perforations and stripe coated types.

The Ilford Magnetic Films and Tapes List shows that this company markets 34 different types of magnetic film alone. Other variants include roll lengths, the method of winding (whether the film is wound with the coated face inwards or outwards on the roll), the size of core and any special edge dye.

How I made my Contest entries

By RON TUCKER

SINCE I purchased my first tape recorder six years ago, my recording experiences have ranged from simple interviewing to complicated "out and about" feature tapes. I have recorded some famous voices, and some equally rewarding unknowns, including for example, Mrs. Violet Kelland a taxi-dancer at one of London's famous dance salons in the 'twenties.

The feature tapes are produced mainly for my "Tapeabout" programme, a regular production for the blind which is distributed by Maurice Chambers in the Midlands.

During the course of a year I make quite a number of tapes. The production of these have taken me to Caxton Hall to record a choir, and to a local pub to record artists appearing there.

Such jaunts keep my recording ear fairly active, and it is probably inevitable that I should collect material suitable for a recording Contest. My only previous success in the BATRC was in 1962. Then, following hours of hard work requiring research, interviewing, arrangements for visiting a factory during the day, followed by hours of editing, dubbing, and re-recording I managed to enter a tape in the Documentary section. "Pipe Organs in the Making" which lasted ten minutes was eventually placed as a runner-up; but even this was encouraging considering the general standard of entries.

Last year I decided to enter three tapes. First there was a documentary about the Pearly Kings and Queens of London, and another, for the Actuality section, made at Speakers' Corner, Hyde Park, dealing with the orators of London. This latter tape incidentally was disqualified by the judges as through an oversight I had left recorded material on track two, and this contravened Clause 6 of the rules.

Although I had already made a programme of songs and interviews with a professional folk-singing group known as the Haverim (The Friends), I felt I would like to make a special tape to enter in the

Music section. Since I had first recorded the group, a girl had joined them, and this improved the style and arrangement of some of their numbers. The two boys are adept with their Spanish guitars and the subject appeared to be ideal material.

They readily agreed to set aside an evening for the recording session, and as their flat would probably be quieter it was decided to make the recording there. On the appointed night I departed with all my equipment. This included a Vortexion mono tape recorder, a Reslo ribbon microphone and stand, earphones, tape, and my box of odds and ends, assorted plugs, screw-driver, etc.

The first thing to decide was the most suitable room, and after a couple of tests we decided to use a comfortable 15 x 12 feet bed-sitting room without too much furniture. It had a fairly high ceiling and on a test run seemed to have just the right amount of acoustic—not too dead, not too live.

The next problem was balance: we tried a few more trial runs at 7½ ips, first with the group all on one side, girl centre and the two boys very slightly off-side; then with the boys one side of the microphone, and the girl on the other side on her own. Further combinations provided no improvements and we decided to use the first layout. They stood about four feet from the microphone, and then it was countdown for our contest tape.

Three songs were recorded and I was allowed to choose which number I should enter. After playing them back I chose an old American folksong called "Watch the Stars." I believe it was out of copyright, but as the London Tape Recording Club is a member of the Federation of British Tape Recording Clubs who for a small fee had cleared musical copyright anyway, I had no worry in that respect. The next evening I spliced out the song so that I could send in the master tape.

One point which had been emphasised to us by our club President, Ken Blake—one of the judges of the musical entries—was the importance of the introduction to your tape. This has also been mentioned in an article in this magazine.

I took his advice and made my announcement, thanking the artists after their song, and then spliced that out. After completing the tape, checking my introduction for balance, etc., I played the tape over several times, listening for flaws in accordance with all the various advice I had received.

Did I have a beginning, a middle and an end? Was it too long? Finally I decided to be quite happy with it, or at least felt it was probably as good as any other entry in its class. In the event this 3½-minute tape, which I really did not expect to get anywhere, was a runner-up, beaten only by a stereo recording.

I must admit that I had pinned my hopes on the documentary tape. However, talking to one of the judges later I gained the impression that I should have slashed it ruthlessly from 9½ minutes to about five minutes when it would have stood a better chance. But that's another lesson learned.

As Ray King pointed out in his article (*December issue, 1964*) success does not come overnight, at least not to most of us. I shall continue to learn all I can from the experts, listening to programmes like "Today" and similar features produced by the BBC, particularly the sort of thing that the creative recordist could tackle.

My ambition is to win a First Prize in one section or another even if only to do it once. As the old proverb goes, "If at first you don't succeed . . ." and that's just what I'm going to do.



The same tape used for

Lord Jim



brings 'big picture' sound
to your tape recorder

You get professional sound from your tape recorder when you use Zonatape. It is the choice of many leading film makers and its latest success is in Lord Jim, this year's Royal Command Film. The film was written and directed by Richard Brooks, released by Columbia Pictures and stars Peter O'Toole as Lord Jim, James Mason, Curt Jurgens, Eli Wallach, Jack Hawkins and Paul Lukas; co-starring Akim Tamiroff and Daliah Lavi.

Zonatape comes in several grades and spool sizes. Double and triple play tapes are available and there is a full range of accessories including printed leader and timing tapes in five colours, splicing tapes and metal stop foil. You can get these professional quality tapes from all good class dealers, but in case of difficulty send to us for the name and address of your nearest Zonatape supplier.

ZONATAPE

(A PYRAL SA PROCESS)

ZONAL FILM (MAGNETIC COATINGS) LTD. *A subsidiary of*



The new symbol of
the Ilford Group

ILFORD Limited, Ilford, Essex.

Dramatape miscellany

By PERSPECTIVE

THE keen drama recordist is now planning to gather sound-effects in the field—for incorporation in his studio recordings next winter.

But it is futile to record effects without a purpose—and then to cram them into plays which are, as yet, unchosen.

So, even if you have no immediate cast, it is vital to look for suitable plays throughout the summer.

Stick to short plays—the one-act stage-plays and short stories. I'm not saying we should never attempt an epic production. But many of us still fail to realise that a short play is just as full of technical opportunities—as well as being easier to act.

PLAN THE TRIP NOW!

First, prepare a general list of the effects and “backgrounds” demanded by the play(s). Estimate the duration with a rough rehearsal—even if you have to speak all the lines yourself! It's no good recording (say) two minutesworth of distant traffic if the scene will run for three minutes and a bit.

Finally, draw up a schedule of suitable locations. But remember that some locations are applicable to others. This saves your time and provides interesting and amusing work. A recording, taken on a pier, will “double” as the boat-deck of a luxury liner. And a small Chinese restaurant might provide the “background” for the palatial dining-rooms. Similarly, the whirring ascent of a large (empty) lift can represent the interior of a turbo-prop. You can even record aerobatics in a saw-mill. This week, I've just recorded a small printing works—to represent the cabin of a helicopter.

If possible, always reconnoitre your recording-sites before “setting-up.” Apart from anticipating the technical problems, you should establish friendly relations with the custodians. We don't all get offered a cream tea at the vicarage—but you'll meet many interesting acquaintances when you seek permission to record. You will also have the satisfaction of being an emissary for the hobby. I have myself introduced tape recording to a tolerably wide number of people in this way.

Power and transport, I must admit, are the kill-joy factors of outdoor recording. It's surprising how much you can record from available power-points; but, if you want to work your mains-model from a battery, you must buy a converter that matches the machine.

Frankly, I've never had any luck with converters. And I'm not mad about weight-lifting. So I now use a battery-portable for all location work. I firmly believe that the day of the mains-model, for outdoor recording, is over.

A battery-portable will bring you delight and fascination. Isn't it time you thought of buying one?

TAKE A TENT

The lightest breeze can ruin an outdoor recording. A wind-shield (made from a large soup-strainer) will cut down wind when fitted over the microphone. But I can't say I think much of wind-shields.

If sneaky breezes are likely, why not instal the microphone inside a lightweight tent? This won't affect the clarity of nearby sound—not appreciably—and the breeze is truly baffled. This way, I've even used a ribbon-microphone out of doors. But, where a tent isn't practicable (e.g., on a railway-bridge), I recommend a simple but effective standby—an umbrella.

TRY A TRIPOD

You can't make good recordings if you waggle the microphone at arm's length. How can you attend to the recorder or check the recording-script?

Any light, cheap photographic tripod is suitable for mounting the microphone. I have, before now, clamped a Grampian DP4 stick-microphone in a cheap hose-clip from Woolworth's—which screws readily to the tripod-head.

But, where you *must* hand-hold the microphone, try fitting a sleeve if the microphone-lead is thin and kinky. This will stop the tangles—and minimise any noises caused by joggling the lead. Make the sleeve from soft rubber gas-tubing, of the type for bun-sen-burners. (Get it from the ironmongers.) It should equal the length of the lead between plug and microphone. Simply remove the plug, thread the lead through the tubing and re-solder the points.

ABOUT A BAFFLE

You might be recording the “firm plunge” of a waterfall, or a barking Alsatian on its chain—or a circular saw. The microphone, if situated very close, sometimes needs a baffle. This “spreads” the impact of the sound—and gives protection in some cases.

I use a thick piece of Perspex (about three feet square) as a baffle—I prefer Perspex because I can “sight” through it. But any non-reverberant solid (e.g., slate)

will serve. The baffle is merely propped up (or held)—and the microphone is set a few inches away from the surface at the back. It's particularly useful when recording effects that “approach and depart”—e.g., running footsteps or a fire-engine. A bare microphone sometimes seems to distort the sound at the moment of “passing”—despite one's wrestling with the gain control. For example, the wind from a 650cc Thunderbird (recorded in a private lane) created too much distortion in the *whoosh*. I wanted a much cleaner *whoosh*. So I held the baffle in front of the microphone and “angled it round” as the motor-bike approached. After the motor-bike had passed, I lifted the baffle away—thus recording the distant skid at the same modulation.

MAKE A MONOPOD

An unobtrusive alternative to a tripod is a monopod—which, in simplest form, is a four-foot strip of wood about 1½ inches wide and ¼-inch thick. Screw a suitably-sized Terry-clip at one end (across the face-side—not balanced on the end-grain), then line the clip with adhesive felt. This will grip the fat end of a stick-microphone very nicely. (If needed, mount a second, smaller clip to support the thin end of the microphone.)

The point of the monopod is speared into ground or jammed between palings, etc. But, by screwing on extensions, you can make the monopod very useful as a “boom”—e.g., for overhanging a duck-pond or a chicken-run. Much better than leaning out and falling in the stream or whatever.

CAUTION!

Longish cables need a “preventer”—especially on rough ground. The cable, before reaching the microphone, is given an allowance of slack and clipped to an intervening point. This *prevents* the microphone being toppled over—e.g., when your assistant strolls through the buttercups. Such a “preventer” can be a second tripod or even a fungus-covered tree-stump—anything handy.

Perhaps you think this a needless precaution? Wait until someone pulls your new battery-portable clean off a farmyard wall. The noise on the tape is quite expensive.

Two-minute tape sketch by David Haines

A monthly exercise in perspective, acoustics and sound-effects

THE BOXING MATCH

RECORD an excited crowd at any convenient location (e.g., a swimming-gala) and utilise as a background to the following dialogue. (Alternatively, record crowd-applause from effects-disc, e.g., HMV 7FX12.) Note: the “commentator” should speak closely into the microphone.

(*Fade in on excited and continuous applause.*)

COMMENTATOR (*speaking rapidly*): I'm sitting at the ring-side, ladies and gentlemen, to bring you a commentary on the last moments of this important boxing-match. We're in the tenth and last round—and the two contestants are still hard at it. Ted Lewis is the present holder of the heavy-weight title—and the challenger is the Walthamstow Basher. (*wild cheering*) Ted Lewis has just made a simply splendid uppercut—the Walthamstow Basher is being driven on the ropes! Ted Lewis is now giving short sharp jabs—one-two-three-four! (*frenzied applause*). I think this is the end, ladies and gentlemen—(*suddenly*) but no . . . the Wal-

thamstow Basher is fighting back! (*frenzied applause*) Ted Lewis is giving way! His face is all running with blood! His nose is smashed beyond all recognition! (*wild cheering*). Oh, what a magnificent uppercut! Ted Lewis was lifted completely off his feet—he's being counted out! (*redoubled yells and applause*). The Walthamstow Basher has won, ladies and gentlemen! (*amid the excitement*). I must try and get a few words with the new champion. . . . Hello, there—how d'you feel now that you're the new champion?

CHAMPION (*a woman; very drawling voice*): Oh, I feel *fine*, thank you—absolutely marvellous.

with a tape recorder: continuing our new series on location recording JOHN CORDEAUX recounts some of his adventures—technical and otherwise—getting the tropics taped.

Stereophile at large

MILLIONS of miles of magnetic tape have flowed past recorder capstans since the tape age universally launched itself soon after the last war. During the war though, in fact, the Germans had developed tape recording to a point where it had begun to play a valuable part in that country's war effort.

British recording engineers at this time were experimenting with a great Juggernaut of a machine which spun around reels of *steel* tape that menaced lives and limbs when the tape broke or unspooled itself all over the room. All splicing, too, had to be done by soldering! The BBC used one of these machines for a while after the war, but it gave a good deal of trouble and really was dangerous.

When I joined the Corporation in 1946, almost one hundred per cent of recordings were made on acetate discs. And when, only eleven years ago, I was appointed an Instructor in the BBC Staff Training Department, discs not tape were still the order of the day: all student productions, for instance, were finally recorded on disc. Taping, I think, was considered neither very reliable nor even very permanent. *Tapus fugit!* Today, believe it or not, the BBC uses 106,000,000 feet of sound recording tape *annually*. This is almost enough tape to wind itself around the world.

At home, where my domestic means of recording in the later forties was also on disc, I had managed to buy cheap a well-worn BSR disc-cutter. For the discs themselves I would usually hope to be able to use the backsides of old BBC programmes, although when funds ran to it, I did occasionally invest in a tin of new acetates. Often as an economy measure, though, I half filled a jam jar with "swarf" from a disc and topped up the jar with methylated spirits. The resulting black "gravy" daubed over an already modulated but unwanted disc, dried very quickly giving the surface a new shiny black coat—generally just smooth enough to re-record over: although this new wine into old bottles technique invariably did the cutting stylus no good at all. I used to get mine, honed up by the BBC in what was officially called the "lapidary," a spacious attic in a converted convent school in Maida Vale—full of BBC girls who spent their entire working week sharpening the Corporation's styli.

The author (seated) plays some of his stereo recordings to Eric Dougharty, Organiser, BBC Stereo (left) and BBC Producer Richard Keen, prior to their selection for the recent short BBC Home Service series "The more we are together". The programme, broadcast in mono, was also recorded in stereo for possible repeat transmission in the future. The suspended AKG C24 microphone was used for the author's comments as he introduced his recorded illustrations.



I was exploring the garage at home the other day and came upon a pile of my old platters. And they were not bad recordings at all, some of them. One particularly seemed to have stood the test of a long time: a vocal quartet of medical students from the Middlesex Hospital, led by my brother William—now, for many years past, a respectable country G.P.—singing a fantastic and (one hopes) apocryphal history of the Dean of the Medical School.

Thereupon followed a decade of my progress as a recordist from, as it were, steam to stereo. From recording at 78 rpm on disc to the sophistication of two-track recording on tape. And during these last ten years or so, I also seem to have acquired (and disposed of) an enormous amount of recording and radio gear of one sort or another. I hope that one day, perhaps, the Editor will invite me to pass on some of the expertise I have attained in bargaining and badgering my way down the lengths of London's Lisle Street and Edgware and Tottenham Court Roads. A most enjoyable electronic pastime, this, of "exchanging and martering." Generally a fruitful one, too. Meanwhile, though, what the Editor actually has invited me to do this month is to continue and, indeed, to conclude the account of my stereo saga around the world.

My work with Thomson Television (International) involves me in much travelling—very far and very wide—and also gives me

a perfect excuse, or as I can truthfully say an absolutely legitimate opportunity, for having excess baggage on the aircraft to the tune of my Uher 4004 (Stereo) Report and much ancillary equipment. Not that the Uher itself is heavy. It isn't. But the battery charger, three microphones, several pairs of headphones, a dozen tapes, EMI editing blocks, paraphernalia, and the recorder—are.

At the radio stations I visit, the Uher (employed monophonically) is quite invaluable for providing actuality material for new programme ventures, and also for instructing staff in the practical and aesthetic aspects of recording in the field. Employed stereophonically, my Uher has been responsible for capturing a feast of fascinating and unique material from many of the warmer (and some downright hot) countries of the British Commonwealth. At least I think the recordings are fascinating—and I am pretty certain most of them must be unique for the good reason that, until fairly recently, a transistorised portable stereo recorder was only a gleam in the eye of one man—Baron von Hornsteine, the Managing Director of the Uher Works.

Unfortunately, even today, when the miracle machine the Baron created has already been on the market (though in extraordinarily limited supply until now) for two years or so, no British manufacturer has produced a truly *portable* stereo recorder: a

recorder which you can sling over your shoulder and with which you can bring the sounds of the world to bay. There is no British machine whereby much of the out-of-doors, or whereby all but the actual sight and smells of, say, the tropics can, at the push of a couple of buttons, be laid out across the floor of an English-winter sitting-room. This magical carpet of sound—stereo sound I assure you, not *seeing* is really believing—can put you plumb in the middle, why not, of a Persian Market. While I have not yet actually recorded a Persian Market, some of the more colourful parts of the world that visitors to my North London home can get with, include: Aden, Antigua, Barbados, British Guiana, Dominica, Gibraltar, Grenada, Mauritius and Nassau. All these tropical tapes were recorded within a twelvemonth, and the vast majority of them were made with the ubiquitous Uher.

This particular stereophile, though, is no monophobe. And there has been a number of occasions when on duty tours to overseas broadcasting organisations that, in order to bag an item of immediate topicality, I have been glad to grab my little Philips EL3300 cassette recorder.

This, in its leather case, is just about the shape and has the dimensions of a medium-sized book. There is space in the case for a microphone and a remote control on/off switch. The whole outfit costs only about twenty-seven pounds. The omni-directional microphone provided is not bad at all—it right royally recorded the Duke of Edinburgh, for instance, for a broadcast during his recent Caribbean Odyssey—but I much prefer the fine little cardioid microphone which Philips can provide at a slightly extra cost and which will also fit snugly in the case. This is the EL6022 stick microphone. The “stick” is a smart black and there is a useful switch on it for bass cutting. Used with this most inexpensive recorder, I have achieved technical quality surpassing that of, for example, the average inserts in the BBC’s Radio Newsreel.

Most of my recordings overseas and far away have, however, been stereophonic. When the material has been wanted for local broadcasting, I have merely copied it off in mono. Duly dubbed and edited, some of my finest hours of Uher stereo now occupy a long shelf in a bookcase at home. Songs, ceremonies and all sorts of sounds. Rock’n’roll and religion (and once, a combination of both). Good music, bad music, dance music, folk music. Playlets, interviews, discussions, table-talk. All the world’s a stereo stage. On my own stage, for instance, I can recall the British Guiana Police Male Voice Choir from one dark,



Above: Cordeaux' Clinic. The author in session with the staff of Radio Barbados. Signature tunes for programmes is the subject for discussion. The Philips EL 3300 and Uher 4000 Stereo Report are at John Cordeaux' right hand. He tells us, incidentally, that the American mains recorder by his left hand is one that he prefers not to mention as he found very little to commend it.

Below: The author talks to eighty-year-old Lady Brooke, the ex-Ranee of Sarawak, who now lives in the West Indies. The resulting programme was broadcast in both Sarawak and Barbados.

heat-sticky night some months ago during the height of “the troubles,” when round and about Georgetown there were daily genocidal killings and woundings. Even so, a big posse of police took an evening off to sing me a selection of robust, local folk songs. There was nothing folksy about the singing of the songs, though. And titles such as, “Justina,” “Ricefield Joe” and “Lay Lay Bessie Down” (this means “sit down”) made the rafters of the wooden police barracks ring. The choir and band were under the stern sway of a vast Guianese, Superintendent Peterkin, who for my (stereo) sake positioned his soloists correctly at their respective microphones by sprinkling Vim on the dark floor.

Under very different circumstances, in Barbados, I recorded another choir. The place was the assembly hall of the Queen’s College for girls in Bridgetown, and the choir was about forty under-ten-year-olds: little brown girls, little black girls, little white girls—all in a row. Sweet unison. They sang for me one of the prettiest and

tenderest songs I think I know. It’s a song about a donkey called “Chiquita.”

But I seem to have made so many recordings which I like to remind myself of. Still in Barbados, there was Festal Evensong in the Parish Church of St. Mary’s. Against a rich backcloth of blue embroideries, I recorded the whole of this beautiful Anglican service gloriously sung by the scarlet-cassocked choir. Outside, a vocal host of syncopated tree frogs served to remind one that the choir was not, after all, that of an English cathedral. Other “religious” recordings on my shelf include part of Pontifical High Mass in Gibraltar’s Roman Catholic cathedral of St. Mary the Crowned. This was on Palm Sunday and the big congregation processing round the nave—every man, woman and child of them bearing and waving a local palm—can now process round my sitting room, palms and all, with the rustle of stereo. At one part of the service, the Bishop of Gibraltar tripped and fell. I am glad to say he wasn’t hurt—the heavy encumbrance of his episcopal vestments cushioned his tumble—but there was a fine old low frequency shudder in my monitoring headphones. After the Mass, the Bishop requested a private playback of the recording of his little accident and, in retrospect, he gave me the impression of enjoying it.

The Prelate on the Rock was not the only Bishop that I have stereo-taped. As I mentioned last month, there was Bishop Moses of the Church of Prophecy in Nassau in the Bahamas. I was the only non-Bahamian (and non-revivalist) in the congregation in the big, bleak church “on the other side of the hill” as is called the less salubrious part of Nassau. Bishop Moses bellowed at us from his pitch pine pulpit, and we bellowed back: mostly “Amen, Amen, Amen” and some hallelujahs. The Right Reverend then led the singing. Accompanied by electronic organ and trombone, what rollicking, gusty glory songs they were! Tambourines started appearing in and banging from all corners

(Continued on page 281)



IN the two previous articles in this series, we have seen that the high head to tape speed necessary for television recording is achieved in Ampex and R.C.A. recorders by scanning a two-inch wide tape across its width, with a rotating set of heads, four in all, mounted round the periphery of a headwheel. The tape moving in the conventional manner at 15 ips, or thereabouts, passes a headwheel spinning at 15,000 rpm. This headwheel lays down 1,000 side-by-side vision tracks every second. The corresponding sound-track is recorded simultaneously, using conventional (linear) methods.

We saw also that television signals are not recordable "neat" in this, or any other known way, directly; a Frequency Modulated (FM) carrier is used, modulated with the wanted vision signal from (nominally) 4.2 mc/s to 6.8 mc/s.

The playback section of the TV recorder, contains, therefore amongst other things, an FM receiver/limiter.

"Tracking," that is, accurate retracing of the pre-recorded signal by the playback process, is ensured by picking up, during playback a 250 cps control track, previously recorded in a narrow linear band on the extreme bottom edge of the tape. This control track can be likened in its effect to the sprocket holes in a cine-film. It is amplified, and used directly to drive the synchronous head-wheel motor, and, after frequency division by four, drives the capstan motor as well.

The whole object of the exercise is to ensure that the tape's passage through the machine is an exact replica of its passage during the record process.

In this article somewhat more will be said of the headwheel technique of recording, together with simplified FM theory relevant to our problem, and, also, a short outline of the basic FM modulator and demodulator used in current TV recorders.

THE HEADWHEEL ASSEMBLY

In both makes of recorder mentioned the headwheel, its motor and slirings, brush-

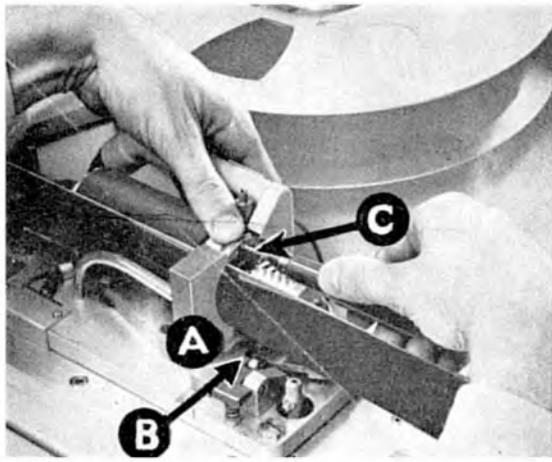


Fig. 1. Headwheel panel of the Ampex video recorder. The operator is adjusting the head-wheel 90 degrees screws. The brushgear from the heads can be seen under the screwdriver ferrule. A: Curved vacuum tape guide; B: Control track head; and C: Headwheel.

TAPE RECORDING TELEVISION

Continuing his series of articles on recording television images on tape, JOHN VALENTINE describes how a signal imparted to the tape during recording is used to maintain correct 'tracking' during the playback process, and continues his explanation of how high frequency recording is achieved using the headwheel technique.

gear and tape vacuum guide are all carried on a plug-in sub assembly. The vacuum supply is also used to draw air over the heads, and through the motor casing. The heads spin at a surface speed of 100 mph, so it will be appreciated that quite a lot of heat is generated by friction as the heads rub the tape.

Both the headwheel motor and the capstan are of the hysteresis-synchronous type. This, in effect, means that the motors rotate at a speed dictated mainly by the frequency of the power supplying them. One feature of this type of motor, is its permanent-magnet armature. The start-up torque is derived from hysteresis effects.

The Ampex motor is driven by three-phase power from the driving servo-mechanisms at 250 cps. Things are slightly different with the R.C.A. model, however, whose motor speed is held constant at less than synchronous speed (still at 15,000 rpm) by controlling the power input, rather than the supply frequency.

GUIDE

The curved (female) tape guide is moved inwards to bring the tape up against the spinning heads by an electromagnet. This comes hard up against a movable stop. For various reasons (explained later) the position has to be adjustable, as the amount to which the heads "dig in" to the tape is critical.

This guide, as explained in the first article (*May issue*) is hollow. A moderate vacuum is exerted in the hollows, to bring the tape into intimate contact with it, forming about 120 degrees of arc, or about one-third of a full circle across the tape width.

Both types of machines include an "idiot" circuit to ensure that the tape transport—the capstan—is moving before the guide pushes the tape in. If the tape is stationary, when in contact with the head-

wheel, the oxide over a narrow strip vanishes in about one second.

Even with the guide "out," the clearance is only about 1/20th inch and, over a period of minutes, stripping can occur through sheer air friction. Careful operators are necessary!

In **Fig. 1** note the control record/playback head low down near the guide. It is worth mentioning that the design of the heads are the result of much careful research. Great precision is required for their manufacture and extreme care needed when the equipment is set-up.

Each of the heads records/replays "packets" of fourteen Television lines during their traces across the tape, and their recording gaps must be *exactly* at 90 degrees to each other. Failure in this causes a most objectionable picture fault, in which vertical objects in the televised scene appear crooked, or jointed like the backbone of a skeleton.

The international standard agreed for

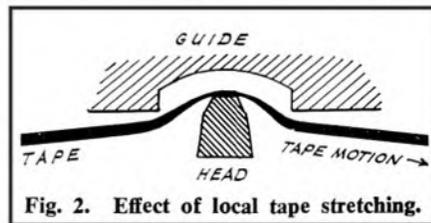


Fig. 2. Effect of local tape stretching.

video recording stipulates that the tips of the heads shall penetrate the tape by .002 inches. The heads do not actually dig in the tape, which, you recall is only .001 inches thick anyway. In practice, the tape stretches, locally, to embrace the head (see **Fig. 2**).

The rate of head wear is high, and special tip materials have been developed to resist it.

Due to the high frequencies handled (up to 10 mc/s), the main magnetic "bits" of the heads have to be ferrites—brittle materials with not much resistance to wear. Accordingly, the tips of the heads are made of a hard magnetic material, the most recent of which is an alloy of iron, aluminium and silicon called "Alfesil." This gives a useful life of up to 120 hours, the equivalent of 20,000 hours in audio use. A typical new head would have its tips sticking out of the headwheel by about .003 inches.

Over a course of about fifty hours' use this figure would reduce to .0025 inches when the head assembly could be said to be in its primes. Its usefulness degenerates after .0015 inches until by .0008 inches it is useless. There are two reasons for this: (a) because its self-cleaning effect is lost, causing clogging and thus intermittent absence of output; and (b) because the edges of the

TAPE RECORDING TELEVISION

quency broadcast is called the Modulation Index β , here β is $75/15 = 5$. So far as I know nobody had investigated what happened when β is less than one before the advent of video recording. It is interesting to see that sometimes pure science progresses on the heels of necessity, rather than before it.

I will moralise no further.

RESEARCH

It was found that good television quality was obtained when an FM band of 4.2-6.8 mc/s was employed ($\beta =$ about $\frac{3}{2}$), using only one set of the natural carrier sidebands, which theoretically extend by intervals to infinity either side of the carrier. As stated

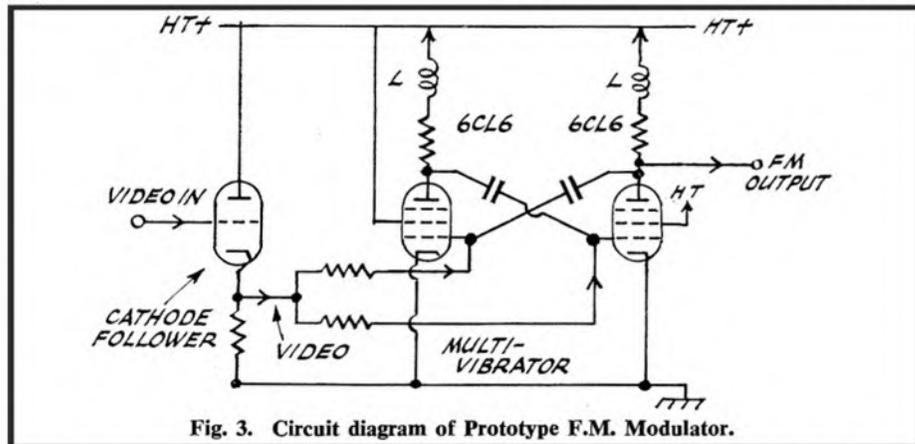


Fig. 3. Circuit diagram of Prototype F.M. Modulator.

record gaps are worn down to chisel points causing the high-frequency response to fall off rapidly as the gap widens.

Incidentally, the effect mentioned at (a), occurs in sound tape recorders as well, though here the effect is not so drastic—rather taking the form of a gradual falling off in performance. Sound heads must be regularly cleaned to prevent this.

BASIC FREQUENCY—MODULATION QUESTIONS

Frequency-modulation, or FM, is now widely known as a very superior method of broadcasting hi-fidelity sound. It can be used to send the whole of the audio spectrum to the listener undistorted by interference.

Very briefly, the reasons for this are that VHF (very-high-frequency) wavebands are usually used where there is no real restriction of band-space available to the broadcaster. The 0-20 kc/s audio band is easily accommodated, compared to the 0-9 kc/s restriction on medium wave broadcasting. More important, outside interference, being as it usually is, exclusively impulsive in nature, can be "wiped off" the wanted signal by limiters, incorporated at some stage in the receiver. (This exposition is, I know, going to cause me a whole lot of trouble from scientific readers. I am prepared to justify it over a beer any time.)

In theory, the text-book types when explaining FM away usually assume the frequency range information carried by an FM channel is small in comparison with the extent of deviation of the carrier used, as in VHF broadcasting.

For example: the BBC's Home, Light and Third channels are sent from the transmitter at from 85 to 100 mc/s carrier-wise. Every channel assumes a definite carrier frequency which is deviated + and - $3\frac{1}{2}$ kc/s (making a total of 75 kc/s), to put across an audio channel of from 0 to 15 kc/s.

The ratio of frequency deviation: fre-

quency broadcast is called the Modulation Index β , here β is $75/15 = 5$. So far as I know nobody had investigated what happened when β is less than one before the advent of video recording. It is interesting to see that sometimes pure science progresses on the heels of necessity, rather than before it.

There is a price to be paid for disregarding the higher order sidebands, of course. And that price is noise. Allow me please, to disregard this, for economy of space, and just say that under the present system noise separation is quite good enough—better than -30 dB.

ACTUAL (PROTOTYPE) CIRCUITS

Some very sophisticated circuits have been dreamed up since the first video recorder was sold. But, in the main these have been merely slight improvements on the basic principle, found to be adequate, if not good at the time.

As an example, the first modulator was simply a free-running multivibrator whose frequency was controlled by the high-level video fed to it as bias. (Fig. 3.) Note the

cathode follower feeding the multivibrator to supply the necessary grid current power. The inductors shown in the multivibrator anode circuits improve the high frequency response of the circuit.

VIDEO-HEAD SUPPLY

As with all tape recorders, an effort is made to supply the heads during the record process with a constant recording current. There is a slight difference, working to our advantage, in video recorders. This is that the more we magnetically saturate the tape, up to a point, the better. Only frequency, you will remember, is important. So, after the modulator stage and a limiter or two, the output to the heads is derived from a "hairy" power valve (EL34 in Ampex recorders), one to each of the four record heads. The EL34 is a pentode, and can be made easily to supply a constant current at the frequencies we're interested in. In setting up a recording channel an effort is made to adjust the record current so as just to saturate the tape and no more.

DEMODULATING AND RECEIVING

Well, there's our tape, saturated or sodden with maximum FM signal, in which only the frequency is important to impart the information. The time has come to consider replaying it.

We re-scan it, after the fashion outlined before, and receive, we hope, a shaky, weak FM signal. It is necessary to detect this signal, amplify it and apply a few corrections. Fig. 4 shows a prototype detector. This operates on the principle that if you show an FM signal a mirror-image of itself delayed by a short period of time ($\frac{1}{4}$ -cycle) it will give up all pretence, and become a conventional AM or amplitude modulated equivalent. This sort of signal can, of course be made coherent by simple rectification and filtering. Before the detector comes four alternate amplifiers limiters. These reduce the signal received to about 1/100th of what it would be without the limiters, getting rid of the interference, and minimising the effect of tape "drop-outs."

As it is implied, the artificial delay-line detector shown has now been superseded by more sophisticated set-ups, though its behaviour is amazingly linear.

This article has been an effort towards explaining the signal chain through a TV tape recorder, and the reasons for the complications.

The next issue in this series will contain a summary together with more detail of other aspects including picture faults and their correction. A description of the Ampex recorder as a quite fantastic audio recorder will also be described.

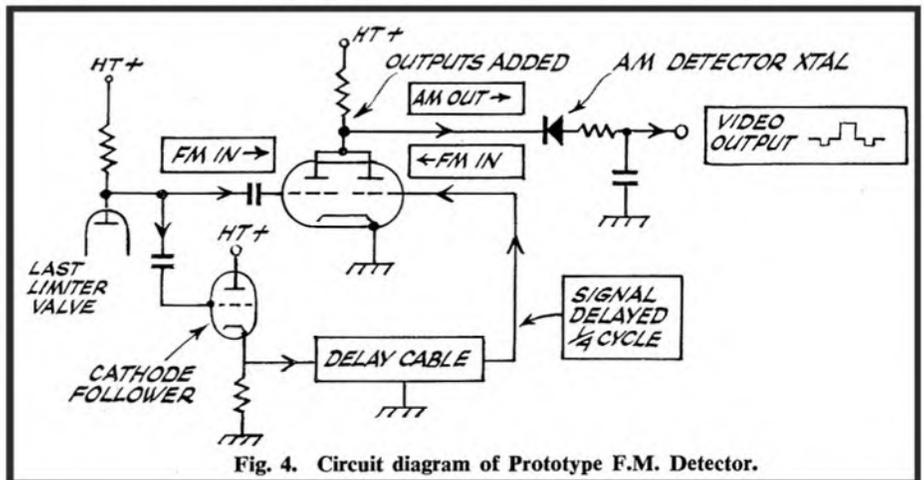


Fig. 4. Circuit diagram of Prototype F.M. Detector.

Exceptionally wide frequency response—virtually level from 40 c/s to 15 Kc/s — combined with excellent transient response, makes this the ideal instrument for the studio and wherever a high standard of fidelity is essential. Two models are available, each in three impedance sensitivities.

MODEL G.R.1, having a semi-cardioid response, gives approximately 10 db suppression to high frequencies at the rear face. It is ideal for overcoming problems of feedback between microphone and speakers.

MODEL G.R.2, having a bi-directional 'figure of eight' sensitivity pattern, discriminates against unwanted side noise both in the vertical and horizontal planes.

Supplied in attractive, padded instrument case, complete with 18 ft. screened lead, swivel holder and connector.

A full range of accessories available. Please send for illustrated leaflet

Enquire, too, for details of the famous Grampian DP4 range of Moving Coil Microphones.



Grampian

GRAMPIAN REPRODUCERS LTD.
Hanworth Trading Estate,
Feltham, Middlesex. Feltham 2657

SCOTCH MAGNETIC TAPE AT NEARLY HALF-PRICE!

Over 3,000 REELS of top quality MAGNETIC TAPE, double coated, SCOTCH made to best possible specification. Intended for electronic industry. This type rarely offered for domestic consumption. Unobtainable elsewhere.

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

Scotch (type 150D/C) Polyester L/P, 900ft. on 7in. reel. **ONLY 15s. 6d.**, p. & p. 1s. 6d. Three reels for 45s., post free; six reels for 84s., post free. Boxed, add 1s. per reel. Spare Reels (unboxed) 7in. 2s. 6d. 5½in. 2s. 3d. 5in. 2s. 0d. 4in. 1s. 9d. 3in. 1s. 6d. Spare Reels (boxed) 7in. 4s. 6d. 5½in. 4s. 0d. 5in. 3s. 6d. 4in. 3s. 0d. 3in. 2s. 6d.

Other Half-Price Bargains—Agfa Tape, 1,200 ft. 7" reel, brand new, fully leaded. Normally 35s. **only 19s. 6d.**, p. & p. 1s. 6d. or 3 for 57s. 6d. post free. Boxed, add 1s. per reel. **Gevaert Tape**, 600 ft. 5½" reel, brand new and boxed. Normally 21s. **only 10s. 6d.**, p. & p. 1s. 6d. or 3 for 30s. post free. **Tape-Head Demagnetizer**, ready for immediate use. Full guarantee. Worth 50s. **only 27s. 6d.** p. & p. 1s. 6d. **Tape Splicer**, fully automatic, no razor blades. Worth 32s. 6d. **only 16s. 6d.** p. & p. 1s. 6d.
Metro ANTISTATIC TURNTABLE MAT 12s. 3d. post free.

DANISH AGAIN!

BRILLIANTLY NEW FROM S.R.T.

A superbly designed Stereo Transcription Turntable with all these wonderful features:

- Belt Drive for negligible rumble.
- Centrifugal Governor for speed adjustment.
- Pick-up Lowering Device.
- Rubber mat with stroboscopic disc.
- Teak Plinth with black base.
- Transparent tinted plastic Dust Cover.

Complete with Ceramic Cartridge
ONLY 19 GUINEAS

With B & O magnetic cartridge and built-in matching pre-amplifier. **29 Guineas.**



FREE CARRIAGE!

Length 13.2" Width 10.1"

A PRODUCT OF THE SCANDINAVIAN RADIO TELEVISION COMPANY. AN IDEAL COMPANION FOR YOUR TAPE RECORDER. TRY IT AT HOME. FULL CASH REFUND IF RETURNED WITHIN 10 DAYS. SEND FOR COLOUR LEAFLET.

K. J. ENTERPRISES (Dept. T.5) 7 Mason's Ave., Wealdstone, Middx.
HAR 0395 (closed P.M. WED. and SAT.)

- 24-HOUR RETURN MAIL ORDER SERVICE
- ALL MAKES OF AUDIO EQUIPMENT SUPPLIED

FRANCIS OF STREATHAM

MAINS TAPE RECORDERS

*Beocord 2000	112 gns.
*Beocord 1500	89 gns.
*Brenell STB2	£150
*Brenell Mk. S/M	92 gns.
*Brenell Mk. V Series 2 ...	74 gns.
Cossor 4 Tr. 1604, 2 speed	39 gns.
Cossor 4 Tr. 1605, 4 speed	62 gns.
Cossor 4 Tr. 1606	29 gns.
Cossor 4 Tr. Stereo 1607	57 gns.
Elizabethan LZ24	34 gns.
Elizabethan Auto	26 gns.
Elizabethan LZ32	29 gns.
Elizabethan LZ34	32 gns.
Elizabethan 4 Tr. 511 St. ...	65 gns.
*Ferrograph 631	88 gns.
*Ferrograph 632 Stereo ...	115 gns.
Fidelity Major	35 gns.
Fidelity Playmaster 2 Tr.	21 gns.
Fidelity Playmaster 4 Tr.	23 gns.
Grundig TK14L	37 gns.
Grundig TK18A	41 gns.
Grundig 23L Auto	49 gns.
Grundig TK40 4 Tr.	87 gns.
Grundig TK41 2 Tr.	83 gns.
*Grundig TK46 4 Tr. St. ...	107 gns.
Philips 4 Tr. 3549	62 gns.
Philips 4 Tr. 3534 Stereo ...	92 gns.
Philips 4 Tr. 3548 2-speed	39 gns.
Philips 2 Tr. 3552 Auto ...	24 gns.
*Revox T36	124 gns.
*Saba Stereo TK230	94 gns.
Sony 200	72 gns.
Sony 500	105 gns.
Stella 4 Tr. 458	39 gns.
Stella 4 Tr. 459	62 gns.
Tandberg Series 6	110 gns.
*Tandberg Series 7	93 gns.
*Tandberg Series 8, 2 Tr.	54 gns.
*Tandberg Series 8, 4 Tr.	59 gns.
Telefunken 55	43 gns.

*Telefunken 85 de luxe ...	83 gns.
*Telefunken 96, 4 Tr. ...	69 gns.
*Telefunken 98 ½ Tr. St. ...	95 gns.
*Truvox R.102	76 gns.
*Truvox R.104	79 gns.
*Truvox PD102 St.9	93 gns.
*Truvox PD104 St.	89 gns.
*Vortexion WVA, 3 speed	£96.7.0
*Vortexion WVA-M 3 sp.	£107.3.0
*Vortexion WVB	£115.10.0
*Vortexion CBL Stereo ...	£172.0.0
Wyndorsor 2 Tr. 707	29 gns.
Wyndorsor 4 Tr. 707	32 gns.

BATTERY PORTABLES

Akai X-IV, 4 Tr. Stereo ...	131 gns.
*Butoba	59 gns.
Cossor 1621	26 gns.
*Fi-Cord 202/A	66 gns.
Grundig EN3 Notebook	23 gns.
Grundig TK6	65 gns.
Loewe Opta 408	39 gns.
Loewe Opta 414	51 gns.
Philips EL3301	26 gns.
Philips 3586	26 gns.
Stella 471	26 gns.
Telefunken 300	49 gns.
Uher 4000S	99 gns.

*Microphone extra

MAINS POWER PACKS

Butoba	11 gns.
Fi-Cord	£7.10.0
Philips, Stella or Cossor ...	£5.12.0
Uher 4000, with rechargeable cell	18 gns.

TAPE DECKS by Brenell, Wright & Wearite.

TAPE-TO-DISC and Copy Service.

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

MICROPHONES, MIXERS, etc.

AKG D119	24 gns.
AKG D77A Stereo	£15.10.0
AKG D19C	£17.10.0
AKG K50 Headphones	£7.10.0
Eagle Mixer	£2.19.6
Fi-Cord TM-II Mixer	£11.5.0
Grampian Reflector	£6.15.0
Grampian DP4 Dynamic ...	£8.5.0
Grampian Ribbon	£11.10.0
Grundig Mixer (Stereo) ...	18 gns.
Philips Preamp	£6.10.0
Reslo Ribbon	£10.12.6
Reslo Pencil Dynamic	£11.12.6
Simon "Cadenza" Ribbon ...	£10.10.0

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

● All WALGAIN Products

TAPES AND ACCESSORIES

Standard, Long, Double, Triple Play in all sizes by all leading makers.

● DEFLUXERS by Wearite, Walgain

PRE-RECORDED TAPES

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

TAPE SPLICERS by Bil, Bond, E.M.I. Matching transformers, plugs, sockets, etc.

STANDS for all types

Hi-Fi Dept.

- AMPLIFIERS (mono & stereo)
 - Quad Scott Tripletone
 - Leak Rogers Cadet Mk III
 - Armstrong B. & O. Pye
 - Loewe Opta CSL
 - TUNERS
 - Quad Rogers B. & O. Leak
 - Armstrong Pye Tripletone
 - LOUSPEAKERS
 - Quad Pye W.B. Wharfedale
 - Goodmans Tannoy Leak
 - Lowther Kef Rogers Elac
 - Eagle Kelly S.H.B. Tandberg B. & O.
 - MOTORS, PICKUPS
 - Garrard incl. Acos, ADC
 - AT6, 401, etc. Thorens
 - Golding Tannoy EMI
 - Connoisseur Lenco
 - Decca incl. Shure
 - ffs Mk. III Ronette
 - Deram, etc. Sonotone
 - Philips B & O, BSR
 - Ortofon SME Mk. II
- All types of Diamond and Sapphire styli, stereo and mono. Microlifts, Garrard, Goldring, Acos Pressure Gaurds; Disc Prener, Acos Dust Bug
- CABINETS—Record Housing and GKD

Please note our only address as below

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

Between St. Leonard's Church and Streatham Station

STReatham 0466/0192

OPEN ALL DAY SATURDAY—Early closing on WEDNESDAY

Letters to the Editor

Let us see more creative recording

AS a regular reader of three tape magazines since their first issue, I feel it is about time that a few hundred more tape enthusiasts started to show us the results of their creative ability.

I make no excuse why I chose *TAPE* as the magazine to which I should send this letter. The three magazines are excellent in every way, but their outlook is of course different.

One is written with professional "know-how," but is what I call "glossy," and its outlook is sometimes viewed through rose-tinted control room windows. The other takes a more serious look at professional set-ups and contains slightly more advanced techniques and reviews.

TAPE comes between the other two books, because it is light-hearted, serious and generally informative in many ways. But I think all three fall down on a number of extremely important points. With the active amateur recording scene in this country in a really bad way, these points should be of major concern to all the tape fraternity.

Firstly, the lack of incentive among active amateur enthusiasts is possibly due to the magazines trying to make us run before we can walk. One instance is that half-track mono/stereo recording is still the most widely used medium. Yet we have been rushed through two-track stereo, four-track mono and stereo, on the way being confused and unsettled by the normal obstacles such as speaker placing, differing speeds and various other difficulties. These have all been encountered as we begin to learn the art of tape recording.

Now we are reading about TV recording. Very interesting I'm sure. We must progress, but it makes one feel that one is being rushed on leaving all the old stereos and half-track "what-have-yous" way behind.

The main interest of all these magazines should be centred on creative technique as applied to all the varied facets of amateur ability, quality of equipment and its limitations. The readers' letters on these lines that we read in the early numbers of the magazine were interesting and helpful, but no one seems to write any more, or if they do, in greatly reduced volume.

Run before walking, point 2, is surely the over-emphasis on quality. Although in agreement that quality must be maintained in all our efforts, a movement in creative recording would begin if the accent were placed more on the "ideas" side of recording.

As a serious amateur recording enthusiast for the past nine years, I am sometimes at a loss for original ideas myself, but I console myself by editing tapes, making up loops, concocting sound effects, and making various gadgets. I'm self-taught and not particularly "up" in the art of circuits and construction. I work alone, writing my own scripts, and operating my own equipment.

I use a eight-year-old Ferrograph, my only recording medium, and two playback decks. It may be said that I haven't advanced because I don't record four-track stereo, or make video recordings, but such accusers are probably only as up to date as the latest article in their favourite magazine.

But I have advanced as far as tape techniques are concerned, because it takes quite some time to become proficient at real editing, and these techniques never change.

The British Amateur Tape Recording Contest last year did not receive as many entries as it should have done. One of the causes could have been because the enthusiasts, especially the newcomers, were (and are) frightened off by all this emphasis on quality.

Obviously we must attain a quality standard. This is very high, because (we are now told) entries have got to have a "BBC-like" quality; or at least that is what we should strive for.

Plugging quality has brought poor results, so why not punch the creative side for all we're worth. We are interested to read about the professional's adventures with a portable, but let us also read about the amateur recordists adventures with a portable recorder, whether successful or unsuccessful.

Another point is that we are made to feel that we should all have a portable recorder and go out and about to find subject material. Thousands of enthusiasts have purchased a mains machine and not many venture forth and buy a second recorder. Finance is a great deterrent, but the reason could also be lack of real enthusiasm.

The accent should be on ideas, editing, creative recording, scripting, microphone technique, acoustics—all plus quality, and much less devotion to tape records, recording from discs and radio, and video recording.

The majority of recorder dealers and shops are only concerned with selling the recorders. While radio shops sell tape recorders at the same novelty level as transistor radios, tape recording as an art will be more or less sneered at. That is something that the magazines and manufacturers jointly must look into.

Summer is here, but for those of you with home-based mains machines, keep your

mind alert for ideas. And on the odd wet evening, switch on the recorder and get to work on anything that will improve your technique or increase your practical knowledge of tape recording.

Use your recorder for creative recording:
NOW!

JOHN HONE.

London, W.12.

Rumble trouble for our stereophile

WE were extremely surprised to note that our old friend, Mr. John Cordeaux, has encountered rumble trouble with his Thorens turntable ("Stereophile at large" June issue).

It will be appreciated that without having the motor sent to us, it is extremely difficult to diagnose what the trouble may be but we are acting on the assumption that in the course of his travels he has been unable to lubricate the machinery. We have, therefore, sent him with our compliments the necessary kit when it is hoped his troubles will cease.

Mr. Cordeaux's complaint, had it been notified to us direct, would have been dealt with, as he knows from previous experience, within twenty-four to thirty-six hours.

S. COHEN.

Metrosound (Sales) Ltd.,
London, N.1.

I am sorry that a stray remark in my June article has so disturbed my old friends at Metrosound. Rumbles sometimes occur in the very best of turntable families and I am glad to be given this opportunity of saying that my own slight rumble trouble has nevertheless not prevented me from recently recommending that the studios of an overseas radio station be equipped throughout with Thorens turntables.

It was very kind of Mr. Cohen to send me the little lubrication kit consisting, as it did, of two mini-bottles of oil. Perhaps I may now be permitted to pour some of their contents onto the troubled waters of our dispute.—JOHN CORDEAUX.

Try a radio dealer for tape spares

HAS Mr. Margoschis (*Letters*, April issue) tried to obtain his tape accessories from a Radio Dealer? This seems more logical than expecting a photographic dealer to hold them.

O. V. WADDEN.

Wadden and Hill Ltd.,
Hounslow, Middlesex.

● NOT A SUBSCRIBER? WELL...! ● THERE'S A BINDER, TOO... ●

A year's subscription to *TAPE Recording Magazine* costs only 25s. (\$3.75) or 2-Year-Sub. 47s. 6d. (\$6.85), including postage. There's a lot to be said for receiving the Magazine regularly at home. Less bother, fewer delays!

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

for copies of your *TAPE Recording Magazine*. Two-tone green, gold-stamped on sturdy spine, each copy can be inserted as received to form a complete volume.

14/6
POST
FREE

ORDER from PRINT & PRESS SERVICES LTD., 7 TUDOR STREET, E.C.4

THE Radio Constructor

From Your Newsagent
2/3
per month

*Published on the first of each month
for the practical radio enthusiast.*

*Articles cover Receivers, Televisors, Test
Gear, Aerials, Amplifiers, Intercoms.,
Recording Equipment, Radio Control of
Models, Workshop Practice, Transistor
Techniques, etc.*

*Annual subscription 33s. p.a., post free.
Direct from the Publishers.*



DATA PUBLICATIONS LTD.,
57 MAIDA VALE, LONDON, W.9

*** TAPE RECORDERS ***

*** ALL HI-FI EQPT. ***

BUY FROM THE BIGGEST MAIL-ORDER SPECIALISTS in the U.K.

*** BEST CASH & H.P. TERMS ***

FREE Servicing * FREE Delivery Anywhere

FREE Brochures: (indicate interests)

HOWARD
TAPE RECORDERS

218 HIGH St.
BROMLEY. KENT.
RAV. 4000

ALAN EDWARD

BEEBY

"AMERICANS," said my friend, "make extremely good tapespondents, but that's about all. The average amateur over there is miles behind his British counterpart in the imaginative and creative use of tape—although you may find that hard to believe." I said I did. "So did I during my first visit there a year ago," he admitted. (My friend is one of the "brain-drain" mob).

"Shook me rigid," he went on. "The majority of 'em will pay the earth for, say, a complete stereo hi-fi set-up, build the thing either into a cabinet or into a wall, stick a couple of records on to tape, and then invite all their friends round to hear the result. After that, they simply lose interest."

"How about tape recording clubs?" I asked. "I've visited three," he said, "and at each one, the main topics of conversation were women, records and money—and in that order. The formula was always the same. Roughly an hour's chit-chat about nothing in particular, a couple of newly-bought LPs being played, followed by a double-quick adjournment to the nearest bar." I suggested that the three clubs he'd visited might have been exceptions, and he admitted that this may, in fact, have been the case.

"But look at it this way," he argued. "Say you chose three British recording clubs at random and paid them a surprise-visit one evening. Wouldn't you expect to find just a tiny bit more interest being shown in the creative side of things than that?" I said he had a point there.

Decided to try a small experiment, and rang an American ex-serviceman I know who has a roomful of recording and reproducing gear to the tune of roughly £500. "What do you use your equipment for mainly?" I asked him. "Oh, you know . . . taping discs and radio-broadcasts and playing them back. That kind of thing."

Like the man said . . .

"GUNSHOTS" OFFER: D. Windsor of London has recently produced an excellent effects-tape of various types of gunshots with the kind co-operation of the Marylebone Rifle and Pistol Club. Will anyone who'd like a copy please send a tape, PLUS RETURN POSTAGE, to Mr. Windsor at 5, Messaline Avenue, Acton, London, W.3.

WHAT do you do with those little cardboard tubes found in the centre of toilet-rolls? (No, seriously!) Throw them away? So do I. At least, I did, until a letter arrived from reader, G. W. Howarth of Co. Durham, containing a suggestion for using these things to store tape-loops. Let Reader Howarth explain:

"Cut off a length of tube sufficient to house the loop, and make a small cut with a razor-blade at each end. Insert one end of the loop into one of the slits and wind on the tape (double, of course) until it reaches the other end, and slip this, likewise, into the second slit. The tape-loop is thus kept safe, untangled, and can be labelled

for easy identification, whilst the ends of the loop, being inside the tube, cannot become creased or damaged."

So now you know! Thanks, Mr. Howarth.

It's an occupational hazard of writing a gossip-column that one occasionally gets the odd "crank" letter. During nearly six years with *TAPE*, however, I can remember only one—from a London reader who said I was mental, a space and time-waster, and that I ought to be committed permanently to an institution. I can't recall exactly what it was I'd written that had prompted these sentiments; some relatively innocuous thing, I believe. One normally ignores such letters, of course. They're usually non-constructive, unhelpful and—when you come right down to it—a bit daft. Nevertheless, I now propose to break the rule by replying publicly, and in my own defence, to a letter which I received last week from "K.M." of Dartmouth. It reads as follows:

"Dear Mr. Beeby, I sent you a tape a fortnight ago lasting well over an hour, and all you can do in return is to send it back with no reply except a scrappy letter. No doubt, you get paid for writing your column, and that's all you care. I thought you welcomed tapes from your readers, but now I know better—and I shall make sure other people know about this, too!"

Well, "K.M.," I've saved you the trouble. To begin with, your letter is riddled with inaccuracies. Firstly, the tape you mention as lasting "well over an hour" ran for exactly fifteen minutes per track. Secondly, my letter was anything *but* scrappy, and ran to a full, closely-typed page in which I answered all your queries. Thirdly, the "that's-all-you-care" bit is so wildly untrue as to be downright funny. Lastly, you do *not* "know better." I most certainly do enjoy getting tapes from my readers. Quite a number tape me regularly, in fact, and have done for years. If I have the time to spare, I reply in a like manner; if not, I do so by letter. What's more, these regular correspondents of mine accept this, and are quite happy with the arrangement. They understand that, although this magazine has occupied a sizeable slice of my life since 1959, I do have other commitments and interests (strange, but true!) and that it isn't *always* possible for me to tape a reply. These are the sort of people I care about, "K.M." People whom I, and other readers, can depend on. People like James Shaw of Liverpool, for example, to whom I addressed a scrappy (yes, "K.M.," a scrappy) note some weeks ago, saying: "So-and-so's in trouble. Badly needs 'lion's-roar' effect. Can do? Two days later came a postcard from James, saying simply: "Will do." Next day, another, saying: "Have done."

And that, for your information, "K.M." of Dartmouth, is precisely what tape recording (and this column) is all about.

FEELING very much the new boy, I am currently standing on the threshold of cine, having at long last taken the plunge after seeing a demonstration of Eumig (Austrian) equipment. I'd been hovering on the brink for some time, and it needed only a slight shove to send me head-over-heels for their "C5" and "Mark S" Sound-Projector. Thus, the scope of the column widens. Anything in particular on cine you'd like to see featured? 88, Clare Street, Northampton is the address.

Letters to the Editor

Tape recordings of plays offered

I HAVE been recording for approx. ten years, and have collected a number of tapes on various subjects. Among my collection are plays, poetry, famous voices, all recorded in either French, English or German. I also have tapes of operas, musicals, and symphonies.

At present I am particularly interested in English plays, poetry, and folk songs, and wonder if it is possible to establish an exchange with an English recording enthusiast.

My record of English texts is rather poor, but I should be interested to hear of any reader requiring French poetry, or plays, including Shakespeare. I particularly desire to obtain recordings of work by Oscar Wilde or George Bernard Shaw.

I own a four-track, four-speed Philips EL3549 tape recorder, which is capable of replaying stereo tapes.

In 1960, as assistant to the Cultural and Press Counsellor of the Iranian Imperial Court I had many opportunities to record many famous voices. Whilst there I tried to organise a local branch of World Tape Pals, but with few tape enthusiasts in the area this was unsuccessful. Even here in France it is amazing how few people have tape recorders, and those that do own them do not use them extensively.

Spending some three to five hours a day either listening or recording, I find it most frustrating having only one recorder. It is rather limiting regarding editing.

Looking forward to hearing from any of your readers, who can contact me at 10 rue des Pecheurs, Endoume, Marseille 7e, France.

E. FREDERICK de TESTA.
Marseille, France.

Back copies of 'TAPE' required

I WONDER if any of your readers have a copy of the series on building a stereo-mono mixer unit published in *TAPE Recording Magazine* in 1960. I have three parts of the series, but am unable to obtain the remainder.

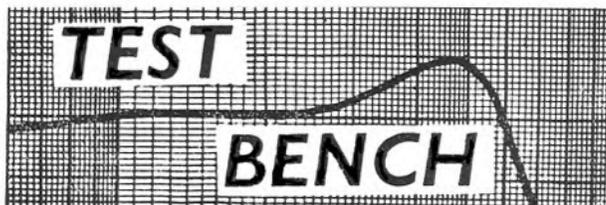
The issues are dated October 19, November 16, and December 14, 1960, and February 22, 1961. Clippings, or copies on loan, would be greatly appreciated.

S. C. CLARKE.

Lindley House, Lindley,
Nuneaton, Warwickshire.

AS the September 20, 1961, issue of *TAPE Recording Magazine* is now out of print, perhaps there is a reader who has a spare copy of which he is willing to sell. I particularly want a copy of the "Test Bench" review of the Sony 521 stereo tape recorder, and would be most grateful to anyone able to send me a copy to 89, Alma Road, Ganville, Wanganui, New Zealand.

W. A. MORTON.
New Zealand.



CLARKE & SMITH MODEL 634

By John Borwick

THIS is the latest in a sequence of tape recorders designed by Messrs. Clarke & Smith over the past few years specifically for use in schools and other educational establishments. From the beginning I believe they had their priorities right. A school's Clarke & Smith recorder soon earned itself a reputation for *robustness*, very much needed in the hurly-burly of a busy school, *ease of handling* by 'prentice hands, and *versatility*, that is ability to record from a variety of sources and provide plenty of volume on playback.

In the Model 634 recorder we see these features very clearly, and with a number

of refinements that make this machine worthy of consideration also by non-educational users of all kinds. A glance at the technical specification will show that versatility has been allied to a performance of high standard. Important points to notice are that this is a mains-operated, fully transistorised unit, that separate record and replay heads and amplifiers permit continuous comparative checking of the input and off-tape signals, that the output power is 10 Watts, and that excellent wow and flutter figures are claimed along with unusually extended frequency response.

WEARITE DECK

Mechanically, this recorder is a close parallel to the Ferrograph 5A/N (see review in February 1965). The top deck is the same Wearite Model and the sloping control panel is similar though with a few additions. Having described the deck in fair detail in February, I shall content myself here with a word of praise for the very low wow and flutter rating. The tape threading path is not the easiest to follow,

but once learned, this and the safe, positive action of all the controls produce a measure of confidence that more flimsy machines can never rival.

The start slide lever is held by a solenoid when operated, but leaves the knob itself to do double duty as a very efficient pause button which will allow you to edge the tape forward by small amounts or lock on as required. Rewind is almost frighteningly fast (the 1,750 feet of LP tape supplied on a seven-inch metal Ferrograph Hublok spool was rewound in just fifty seconds), and the clock position indicator is reliable.

Reading from left to right, the control panel carries a pair of microphone input sockets (one for high impedance and one for low impedance, three-way Post Office jack) followed by two identical record volume controls which allow mixing of the microphone input with an auxiliary input (see below). Over these controls is a slide

TAPE DECKS - HI-FI EQUIPMENT - MICS - RADIOS - SPEAKER SYSTEMS



The first choice in Hi-Fi Equipment

ONE CANNOT COMPROMISE WITH HIGH-FIDELITY. THE ONLY WAY TO SAVE MONEY IS BY BUILDING THE MODELS YOURSELF!

Compare any Heathkit model for price performance, quality

Ease of assembly is guaranteed—even for those without previous experience—by the comprehensive yet simple step-by-step construction manuals supplied with every Heathkit model.

Because you build them yourself—Heathkit units cost considerably less than comparable pre-assembled equipment. You cannot buy the parts any other way as cheaply.

Every Heathkit product—assembled in accordance with our instruction manuals is guaranteed to meet published performance specifications, or your money will be cheerfully refunded.

By taking advantage of our convenient credit terms—you can enjoy your model right away—and pay for it in easy monthly instalments.

OUR WIDE RANGE INCLUDES:—

AUDIO

Cabinets, Turntable Units, Mono and Stereo Amplifiers, Pickups, Speaker Systems, Mono and Stereo Control Units, Tape Preamplifiers, Tape Decks, etc.

RADIO

AM/FM and FM Tuners, Transistor Radios, SW and Communication Receivers.

TEST INSTRUMENTS

A range of Audio Test, Home Workshop, Service, and Laboratory Instruments.

MISCELLANEOUS

Children's Hobby Kits, Tool Kits, Intercom, Electric Organs, and a wide range of Amateur Radio Gear.

SEE THE COMPLETE HEATHKIT RANGE IN THE FREE CATALOGUE



CABINETS
from £11 12 6



STEREO AMPLIFIER
from £13 7 6



TAPE PRE-AMPLIFIERS
from £19 18 0



AM/FM TUNERS
£15 18 0



TAPE DECKS
from £14 19 6



SPEAKER SYSTEMS
from £10 17 6



Without obligation please send me

FREE BRITISH HEATHKIT CATALOGUE

Full details of Model(s)

Name

Address

(Block capitals please)



T.7

ALL MODELS also available assembled. Prices on request. Deferred Terms available in the U.K. over £10!

DAYSTROM LTD.

Dept. T-7
Gloucester, England

Stereophile at large

(Continued from page 273)

of the church, resulting finally, I may say, in a rich stereo treat for me.

Then, still stereo clerical, there was Father Souchon, a Roman Catholic priest in Mauritius. He introduced for me the local, Mauritian, equivalent of the Caribbean calypso. It's a rhythmic song and dance called a "Sega." He had collected together a Sega group—guitar, washboard, drums and vocalists, and Father himself introduced one of the Segas I recorded, thus: "Mauritius is a 'ot country. And in a 'ot country, everything is 'ot. Food will be 'otter and more spicy, and sex will be 'otter and more sexy. . . . This Sega you are going to hear is one of the sexy kind. . . ." My Mauritian friends, who of course understood the Creole in which the words were sung, confirmed to me that it was.

But aside from sex and religion, a very great many other recorded memories jostle one another in my tape archives on the bookshelf. In South Arabia, for instance, at Ja'am, capital of Lower Jafa'a State, I recorded Sheikh Mahmoud bin Omar Saif Alibidily, an important Arab leader, urging members of his tribe to lay down their arms. They had been fighting (amongst others) the British in the Yemen. Outside of the stifling hot office where I made the recording, out over the sand-dusty streets of this desert town, a Muzzein high in his minaret is calling the faithful to noonday prayer. A scraggy dog howls suddenly into the arid air. And so on, and so on. But the stereo recording really does resurrect the incident very exactly.

Other of my tapes I tend not to weary of include Guard Mounting by the 1st Bn. The Middlesex Regiment in Gibraltar; nineteen-thirtyish dance music brilliantly played by the Police Band of "rainbow island"—Mauritius; calypso singing by "Lord Radio" and his boys in Barbados; dawn over Grenada, cocks crowing among the frizzle fowls, and the mellifluous jingle of the chimes of the bells of St. George's parish church; a happy samba-ing crowd at an annual ball thrown by the St. John's Tennis Club in Antigua; a long conversation with the eighty-year-old Raneer of Sarawak, now living in the West Indies; and a heart-warming sing-song get-together with all the parishioners of St. Mark's in a humble little seaside village in Dominica, one of the lesser known and least touristic of the Caribbean Islands. And once again, so on. . . .

I write this in London, in between overseas tours on behalf of Thomson Television (International). I have, in fact, just returned from a trip to the Middle East where my stereo bag included: a voluble official guide at the Cairo Museum, excellent Arab musicians in Beirut and, on the Persian Gulf, at one end of the Trucial States, a couple of viciously quarrelsome taxi drivers, and at the other end of the State of Dubai's Pakistani Police Band in the whole of the Blue Danube Waltz with repeats.

When you read of these stereo adventures, it is probable that I myself will be back again over some rainbow or beyond some blue horizon. It is certain, if I am, that I will have my Uher tucked safely underneath my arm.

switch for cutting out the erase current, should you wish to superimpose one recording on another.

Then comes the level meter, which is calibrated in percentage modulation with a clear red band to indicate maximum distortion-free signal. Three replay control knobs follow, for bass, treble and volume. A second slide switch above these controls changes over the meter and speaker monitoring from the input signal to a separate playback head: and finally there are auxiliary input and output sockets. The former is rated at 60 mV, 0.5 Megohm for radio recording, etc., and the latter provides a 1 Volt peak signal for feeding to a separate amplifier.

I must compliment the designers on the very clear labelling of all controls. This is a real boon, and not just for classroom users. On many tape recorders the controls are poorly labelled and the setting of control knobs has to be guessed at. Here each knob has a black scale with large white letters, the volume controls numbered from 0 to 10 and the tone controls from 5 on one side through a centre zero to 5 on the other.

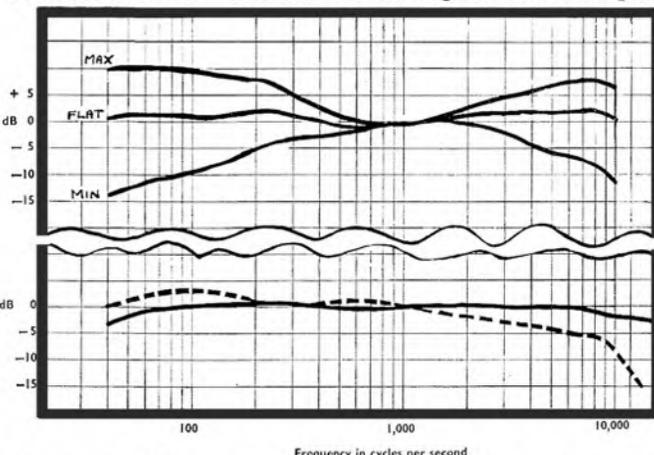
A small panel at the side of the machine takes the mains plug and has a mains on/off switch and two output sockets. The first is a normal 15 Ohms external loudspeaker socket: the second is rated at 70 Volts and

Frequency response tests produced the very good results shown in the graph below. The first diagram indicates the measured replay characteristic with a 7½ ips CCIR test tape. It also shows the wide and effective bass and treble control range—so useful for adapting playback quality to different room acoustics and types of external loudspeaker. The second demonstrates the wide, level response at both speeds and was obtained by feeding in an audio signal generator at the auxiliary input socket and replaying through the auxiliary output socket, with both tone controls set at the middle position.

Mechanical noise is very low and even the noise of tape scraping against the spool edge can be eliminated in a couple of seconds by adjusting the bobbin type guides as described in the previous review. Some background hiss was noticeable on recordings made at low volume via the auxiliary input. But raising the input level by feeding into the high impedance microphone socket cured the trouble. Wow could just be detected on some tones at 3½ ips but this was not evident at 7½ ips.

The strong wooden case will stand up to hard wear, and is necessary with such a heavy machine. Although I have seen frail lady teachers lugging Ferrograph and Clarke & Smith recorders single handed in the past,

Frequency response of the Clarke & Smith Model 634. Top: Replay response using CCIR Test Tape showing tone control range. Bottom: Record/replay response at 7½ ips ——— and 3½ ips - - - - -.



is intended for use with the multi-speaker circuits found in many schools. Special circuitry ensures that the output volume is not materially changed if numbers of the loudspeakers are faded down or switched off.

PERFORMANCE TESTS

Initial listening tests were made replaying various tape records and relaying radio programmes. The 9 x 5 inch internal loudspeaker gave reasonably good quality and showed no distress when delivering sounds at levels well above domestic listening. Changing over to a large hi-fi loudspeaker showed that the signal from the amplifier is worthy of as good a loudspeaker as one can afford.

Speech and music were then recorded and played back. By throwing over the monitoring switch the taped signal could be distinguished from the input signal only by the slight background hiss on undermodulated recordings where playback volume was being deliberately increased. The provision of both high and low level microphone inputs is sensible on school recorders. Sometimes a tough crystal microphone will be ideal for passing from child to child in speech recording: then for music recording a superior, but possibly more delicate microphone can be run out on a long lead.

I hope they will see the value of the special long handle on this new model designed for sharing the load between two people (volunteers from amongst the pupils?) Used with the right microphones, a good radio receiver and loudspeaker relay system, this recorder should prove a worthwhile acquisition for any school, club or group activity.

MANUFACTURER'S SPECIFICATION

Tape Speed: 7½ and 3½ ips.
 Number of Tracks: Two.
 Maximum Spool Size: 8½ inches.
 Power Supply: 200-250 Volts, 50 cycles AC.
 Audio Output Power: Ten Watts.
 Frequency Response: 50-15,000 cps ± 3 dB at 7½ ips; 50-9,000 ± 3 dB at 3½ ips.
 Wow and Flutter: Better than 0.16 per cent at 7½ ips, 0.2 per cent at 3½ ips.
 Inputs: 1 mV at 300K, 10mV at 15-30 Ohms, 60 mV at 0.5 Megohm.
 Signal-to-Noise Ratio: at 7½ ips, 50 dB unweighted; better than 60 dB weighted to AMG recommendations.
 Outputs: 15 Ohms, 70 Volt line or 1 Volt at 5,000 Ohms.
 Overall Dimensions: 17½ by 17 by 10 inches.
 Weight: 46 lb.
 Price: £108 3s.
Manufacturer's: Clarke & Smith Mfg. Co. Ltd., Melbourne Works, Wallington, Surrey.



YOUR LOCAL DEALER

In this feature you can check your nearest dealer who is a hi-fi specialist giving expert attention to tape equipment.

LONDON

CITY & ESSEX TAPE RECORDER CENTRES

BRITAIN'S LARGEST TAPE RECORDER SPECIALISTS

(See Page 225)

242, 4 Pentonville Rd., Kings Cross, N.1 TER 8200
 228 Bishopsgate, London, E.C.2 BIS 2609
 2 Maryland Station, Stratford, E.15 MAR 5879
 205, High St. North, East Ham, E.6 GRA 6543

Lee Electronics

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

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

SEND FOR FREE LISTS OF RECORDING TAPES, RECORDERS, AMPLIFIERS, ETC.
 All Machines demonstrated for performance on Record and Playback. All leading makes of Hi-Fi equipment from stock

PADDINGTON 5521

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

MAGNEGRAPH

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

Tape records reviewed

CLASSICS The music



By Edward Greenfield

on this tape is splendid

HANDEL. Tenor Arias from "Atalanta," "Samson," "Alexander's Feast," "Semele," "Acis and Galatea," "Radamisto," "Alceste," "Jephtha" and "Judah Maccabeus." Jan Peerce with the Vienna State Opera Orchestra conducted by Hans Schwieger. WRC (TCM 62), 3½ ips, mono. 29s.

Jan Peerce was one of the few modern tenors approved of by Toscanini—largely one imagines because of his almost instrumental accuracy. But latterly Peerce's style, like that of most operatic tenors, has grown coarser, and it comes as something of a surprise to find him tackling a group of splendid Handel arias, which depend for their effect above all on classical poise and sense of style.

Generally the result is most exciting, and Peerce's accuracy stands him in good stead over all Handel's complex florid writing. Sometimes Peerce's tone grows less than beautiful, and one would hardly describe the interpretations as subtle musically with next to no soft singing. But the music is marvellous, and the well-known arias like "Where'er you walk" from "Semele" and "Love sounds the alarm" from "Acis and Galatea" are more than matched by the other unjustly neglected ones.

The Viennese musicians accompany with brisk vigour, and the recording is excellent with a fair degree of reverberation. It allows Peerce's words to be heard very clearly. Old recordings of "Love sounds the alarm," I remember, used to make the line "fear is a-flying" sound like "beer is a-flying," and with some tenors of that time that might well have been true.

TCHAIKOVSKY. Piano Concerto No. 1. Unnamed soloist with the Sonor Symphony Orchestra conducted by Hans Ledermann. Tempotapes (No. 4), 3½ ips, mono. 21s.

Unnamed or not the soloist certainly has a will of his own, and that works both to the good and the bad. One's attention is certainly held, and at a moment of exasperation one will suddenly be charmed by a magical half-tone passage. The phrasing is always interesting and musicianly, which makes it all the more irritating that there are moments of such willfulness that it is hardly possible to give a recommendation. The opening of the allegro of the first movement provides the most obvious instance. Tchaikovsky wrote his theme with pairs of notes snapping along in triplet groups with the third fraction of the triplet left blank. But our unnamed soloist makes

it easier for himself by playing quavers without the snap of triplet rhythm. His failure to observe what is written is made the more noticeable when the woodwind enter and play the theme accurately.

The recording does not sound to be of the most modern, but the balance is fair enough. It sounds to me as though this was taken from a live (or broadcast) performance—not only because of the flaws of ensemble but of the sense of continuity. The whole concerto is given on the first track of the tape, leaving the second completely blank for other uses.

BACH. Suites for Orchestra Nos. 1 and 2. English Baroque Orchestra conducted by Hermann Scherchen. WRC (TT 401), 3½ ips, mono. 29s.

In recent years the controversy over how to perform Bach's music has grown more intense just at the time when scholarly research is revealing more and more about playing conditions in Bach's own time. One has now almost come to take for granted—in recorded performances at least—that a modest-sized orchestra will be used and not a full body of the modern pattern. One now also takes it for granted that a continuo instrument will be used in the authentic manner and that this will be a harpsichord rather than a piano.

The textual problem is more complex with ornamentation a special worry and the interpretation of dotted rhythms leading to all sorts of pitfalls. On this last point Scherchen does not follow the latest dictates of scholarship, and some may object, but generally his approach is a good compromise between exact authenticity and modern convenience. The orchestra is of the right size, and though the continuo is rather backwardly recorded, one can just hear the harpsichord through the rest. Surprisingly when one remembers Scherchen's hard-driven performances of Beethoven, his Bach is rather gentle with insistence on warm, expressive phrasing. That too may make the purists wince, but the result is generally so sprightly—the woodwind specially good—that only the specialist need worry. As for the works themselves they are among Bach's most warmly attractive instrumental music. No. 2 with its flute solo part has become more popular than its companion, but both must be highly recommended. Richard Adeney, one of Britain's most noted flautists, is the admirable soloist in No. 2.

Here is such a galaxy of talent

JAZZ



By Mike J. Gale

GREAT ELLINGTONIANS. Volumes One and Two. Personnel grouped in three outfits led by Mitchell Wood (tn), Harry Carney (bar) and Paul Gonsalves (ten, gtr) with Harold Ashby (ten); Shorty Baker, Willie Cook, Ed Mullens, Andre Merenguito Forda (tpts), "Cue Porter" (alt), Roger Ramirez, "Sir" Charles Thompson, Rollins Griffith (pnos), Aaron Bell (bass), Oliver Jackson, Sam Woodyard, Jo Jones

(dms), Dicky Wells, Vic Dickenson (tbn) and Ray Nance (tpt, vin, vcl). WRC (TT 479/480), 3½ ips, mono, 29s. each.

Duke Ellington's long career—he was born in 1899—has gradually veered away from the generally accepted definition of jazz while retaining an association with it. Many musicians have served in his orchestra and even more have been influenced by it. This album, recorded in 1960-61, uses a galaxy of talent that has been intimately associated with Ellington.

With sixteen numbers and nineteen musicians assembled into three groups it would be unfair to spotlight any one performer or item because of the variety of the programme and the lack of space here. The reviewer can only enthusiastically recommend it.

The sixteen numbers are *Hang on There, Baby Blue, Jeeps Blues, Ohso, Snowstorms, Just Squeeze Me, New Cambridge Blues, Rock me Gently, Our Delight, Midnight Sun, Easing on Down Piccadilly, Hand Me Down Love, Out of Nowhere, Sunday, Five o'clock Drag* and *Swallowin' the Blues*.

VELVET BRASS AND PERCUSSION.
Percussion all stars. Crown (ST 116)
7½ ips, Stereo, 55s.

An unidentified band are responsible for this uncommendable collection which lacks the smallest spark of originality and imagination both in arrangements and performance.

Secrecy has been carried to an extreme for, in the absence of sleeve notes, the reviewer could not even learn the year of recording from the importers.

The musicians, if they are well known, have successfully preserved their identity by playing like a team of computers: cold technical perfection matched equally by creative sterility.

The set covers *La Golondrina, The Sun, Percussion in Brass, Sabre Dance, Cielito Lindo, Two Guitars, Swingin' Staters, Denozo, El Relicario* and *Valencia*.

BEN WEBSTER MEETS COLEMAN HAWKINS. Personnel: Ben Webster (ten), Coleman Hawkins (ten), Budd Johnson (ten), Roy Eldridge (tpt), Jimmy Jones (pno), Les Spann (gr), Ray Brown (bass), and Jo Jones (drums). WRC (TT 402) 3½ ips, mono, 29s.

Jazz was once held responsible for everything that was socially decadent and the saxophone in particular was singled out for criticism by "serious" musicians who claimed it produced loud unmusical noises. It was Coleman Hawkins who created a "rhapsodic" saxophone over forty years ago and introduced new dimensions into what had been, admittedly, a rather limited instrument.

Hawkins influenced many men including Ben Webster, nominal leader on this album, and not only because they were once members of the Ellington Orchestra.

Ellington's name crops up a lot this month because the whole of the first track, recorded in New York in 1959, is taken up with his *In a Mellow Tone*, a more than attractive showcase for inspired instrumentation. There is an element of unfairness, though, for Budd Johnson, another great

tenor-saxophonist, is left out of the title despite his brilliantly creative work on this track.

De Dar, one of three Webster compositions included, provides an interesting opportunity to compare Hawkins, Webster and Johnson as they take their solos in remarkably individual styles.

Young Bean, Budd Johnson and *Time after Time* complete the collection.

THE BAY BIG BAND PLAYS DUKE ELLINGTON. Tempotapes (13), 3½ ips, mono, 21s.

As I said, this is Ellington's month as far as this column goes, but the Francis Bay Orchestra's tribute to him does not measure up to anything more than a rather mediocre and limited performance devoid of anything especially worthy of praise or condemnation.

The jazz public are much too knowledgeable to instantly buy anything on the Ellington bandwagon when they can buy Ellington himself, and the appeal of this album is surely restricted to adherents of the Francis Bay Orchestra.

Take the "A" Train, *Don't Get Around Much Anymore, Solitude, Mainstream, Thing's Ain't What They Used To Be, Do Nothing till you hear from me, Sophisticated Lady, Jack the Bear* and *Passion Flower* make up the collection.

OXFORD CONTEST

(Continued from page 267)

opening announcement this piece had authority. It made you listen. But in saving the wonderfully descriptive prose for the narrator, and yet having two other actors, in the end full dramatisation was missed.

Nick Wilson was responsible for the recording and he really cared. The narrator's microphone was indoors and placed near a cushioned sofa. Given less projection from the narrator, this would have been very acceptable. Most of the action with the two actors is out of doors, so Wilson put their microphone out of doors in the College quadrangle. This was a far from dead acoustic, but it achieved its purpose because it sounded different. Unfortunately the two actors were slightly out of perspective, and therefore not matching with the narrator. Surprisingly, although there was a mixer, the narrator was recorded separately from the actors and the whole assembled later. This seemed to be unnecessary labour, rather defeating its own end.

All the entrants had thought carefully about their subject matter. Only "Mushrooms" attempted to use the ability of the tape recorder to catch unscripted comments and opinions on the wing. All the tapes showed the virtues of a good script well written. Perhaps this was to be expected of Oxford undergraduates, but the moral points wider.

All the entrants too, had appointed a recording engineer. He sometimes spoke as well, but basically he was there to assist the producer. After all, a second opinion is always worth having.

YOUR LOCAL DEALER

LONDON

Masseys Centre 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)

SHEEN

TAPE RECORDER HI-FI CENTRE

— 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
Synchrodek—WE ARE STOCKISTS OF
SYNCHRODEK

TERMS—EXCHANGES, ETC.

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

Showroom: PROspect 0985

10 a.m.—7 p.m.

WIMBLEDON'S

TAPE RECORDER CENTRE

Agents for:

FERROGRAPH, VORTEXION,
REVOX, BRENELL, GRUNDIG,
TRUVOX, PHILIPS, COSSOR,
REFLECTOGRAPH, ETC.

GET IT TAPED THE EXPERT WAY
—By letting us install your apparatus

TEL-LEE-RADIO

220 The Broadway, Wimbledon, S.W.19
LIBerty 4946

MIDLANDS

— STOCKPORT —

FAIRBOTHAM & CO. LTD.

47 Lower Hillgate STO 4872

FERROGRAPH, REVOX,
TANDBERG, BRENELL, SIMON,
TRUVOX, SONY, PHILIPS,
MAGNAVOX, GRUNDIG,
TELEFUNKEN

All models on comparison demonstration
Evening demonstrations by appointment

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

"Crown," Teletape Ltd., 33, Edgware Road, Marble Arch, London, W.2.

"Tempotapes," A. C. Farnell Ltd., Hereford House, North Court, Vicar Lane, Leeds 2, Yorkshire.

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

YOUR LOCAL DEALER

MIDLANDS

SOUND BUSINESS

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

Backed by a
First-Class Service Department

TYSONIC

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

THE SOUTH

PLYMOUTH

TOM MOLLAND LTD.

102 CORNWALL STREET

Phone: 69282

FERROGRAPH, REVOX, TAND-
BERG, SIEMENS, AKAI, UHER,
SONY, B & O STEREO MASTER,
FI-CORD, AND

The largest selection of Hi-Fi equipment
in the West

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

WORTHING TAPE RECORDER CENTRE

- Tape and Hi-Fi Experts
- Agents for all types of machines and equipment
- SERVICING & REPAIRS

THE MUSIC SHOP

22 NEW BROADWAY,
Tarring Road, Worthing, Sussex.
Telephone: Worthing 3630

NEW PRODUCTS

TELEFUNKEN INCREASE THEIR RANGE

MORE tape recorders making their debut at the recent Audio Fair include the Series 100 by Telefunken. First of the new models is the Magnetophon 104, a single-speed, 3½ ips, model selling at 39 guineas. It is illustrated below.

It has a quoted frequency response of 40-14,000 cps, and will accommodate 5½-inch spools. Using standard-play tape (850 ft.) it will provide 45 minutes playing time on each of its two tracks.

Main features of the M104 is the automatic recording-level control. Also featured are a magic eye recording-level indicator, tone control, a built-in 5½ x 3 inch loudspeaker handling the power output of 2½ watts, push-button operation, inputs for microphone and radio/pick-up, and outputs for radio and external loudspeaker.

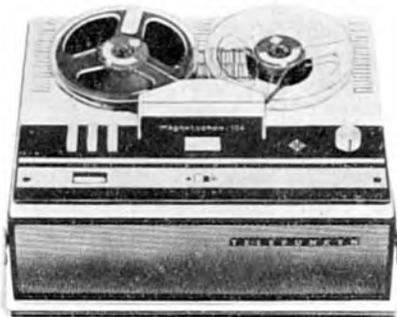
It measures 15½ x 11½ x 6½ inches, and weighs 20½ lb.

Second new machine is the Automatic II, featuring a self-adjusting recording level control. With specifications similar to the M104, the Automatic II also features a three-digit rev. counter, and automatic tape-end stop facilities. The price is 62 guineas.

The M105, at 62 guineas, is a two-speed half-track recorder featuring remote control facilities for stop/start.

It has a frequency response quoted as 40-16,000 cps at 3½ ips, 40-9,000 cps at 1½ ips. Using standard-play tape (850 ft.) at 3½ ips, the playing time available is 45 minutes per track on the 5½-inch spools accommodated.

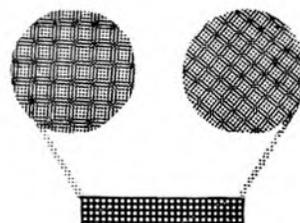
Among the features are pause control, three-digit rev. counter, tape end stop, a built-in 5½ x 3 inch loudspeaker handling



the output of 2½ watts, push-button operation, magic eye recording-level indicator, tone control, inputs for microphone, radio/pick-up, and outputs for radio, extension loudspeaker and earphones.

It measures 15 x 11½ x 6½ inches, and weighs 25½ lb.

Largest of the new models is the M106, selling at 66 guineas. This is a four-track two-speed mono recorder with accommodation for 5½-inch spools. The quoted frequency response is 40-16,000 cps at 3½ ips, and 40-9,000 cps at the slower speed.



A wide range of facilities are featured on this recorder, including monitoring, sound-on-sound recording, re-recording, automatic input selection, remote control for stop/start, plus all the features of the other models.

Available at the end of July will be the M203 (illustrated above). This is a four-track, two-speed stereo model to sell at 79 guineas.

Welmec Corporation Limited, 27, Chancery Lane, London, W.C.2.

TWO NEW MODELS FROM ELIZABETHAN

A NEW tape recorder, available in two and four-track versions has been produced by Elizabethan. This is the LZ32 (illustrated below) selling at 29 guineas, the four-track version, LZ34 costs 32 guineas.

Featuring the B.S.R. TD10 three-speed tape deck, the new unit will accommodate seven-inch spools, providing a playing time of 64 minutes per track using standard-play tape (1,200 ft.) at 3½ ips.

The quoted frequency response at the three speeds are 50-12,000 cps, at 7½ ips, 50-8,000 cps at 3½ ips, and 50-4,000 cps at 1½ ips. Wow and flutter is rated at not greater than 0.2 per cent at 7½ ips, and signal-to-noise ratio as better than 40 dB.

Among the features are facilities for monitoring, separate bass and treble controls, digital rev. counter, safety erase lock, and inputs for microphone and radio. Also incorporated are two output sockets for an



external loudspeaker and amplifier, and a built-in 10 x 4½ inch elliptical loudspeaker handling the power output of three watts. The power supply required is 200-250 volts, AC. Consumption is rated at sixty watts.

It measures 15½ x 15 x 7½ inches, and weighs 24 lb.

Elizabethan Tape Recorders Limited, Crown Lane, Romford, Essex.

VITAVOX INTRODUCE THEIR LATEST MICROPHONE

FOUR alternative impedances, 25, 200, 10 K ohms, and high are available in a new dynamic microphone recently introduced by Vitavox.

The new unit, the Multi-Zed M100 incorporates a simple screw to adjust the desired impedance. It has a quoted frequency response of 50-15,000 ± 3 dB and is supplied complete with nine feet of screened cable. The M100 is finished in black satin, and features a flexible chromium plated stem. The weight is 17 ounces.

Vitavox Limited, Westmoreland Road, London, N.W.9.

LIGHT-WEIGHT HEADSET BY AMPLIVOX

AMPLIVOX LIMITED announce a new high quality version of their Jetlite headset (illustrated below).

This features moving-coil earphones with a frequency response of 20-20,000 cps. Optional with the headset is a lightweight microphone on a boom arm.

The headframe and boom arm is constructed from sprung steel, and the earpieces are fully adjustable with maximum flexibility of the boom which can be adapted for wearing from either side of the head, or parked above the head when not



in use. Foam ear cushions are used for noise exclusion and minimum discomfort and irritation.

Each earphone is 200 ohms impedance, and can be supplied for stereo applications. The price is £12 6s. 8d.

Amplivox Limited, Beresford Avenue, Wembley, Middlesex.

NEW MAINTENANCE KIT FROM AMERICA

A RANGE of tape recorder maintenance products have recently been introduced to this country from America.

First is the Fil-Magic "Pylon" kit designed to remove dust, abrasive debris, and similar residues from tape guides, heads and pressure rollers. The kit comprises the pylon, and "Long Life" fluid which applied to the pylon, lubricates and cleans the tape. There is a choice of mountings for the pylon; a rubber sucker, flange mounting for insertion under a screw or tape guide already on the deck, or a screw-in type to fit an existing hole on the deck. The kit is supplied complete with one of the three types of pylon, a bottle of tape conditioner, a bottle of tape head and roller assembly cleaner, and spare sleeves for the pylon. The price is 35s. (plus 1s. 6d. postage).

Also announced is the Fil-Magic 200 Long Life Kit for head cleaning and guide lubrication where automatic lubrication is not possible. Each kit contains a two-ounce bottle of cleaner fluid for record and erase heads and pinch-roller assembly; and a similar bottle of lubricant fluid for application by cotton wool "buds." The kit sells at 17s. 6d. (1s. 6d. postage).

Concordia, 42, Museum Street, London, W.C.1.

TAPE/SLIDE CONTROL FOR REVOX RECORDER

NEW from Revox is the Slide-o-Matic, a special transistor attachment for use with the Revox Model 736 (reviewed in May issue) to operate an automatic transparency projector. Small enough to be held comfortably in the hand, it contains three push-button controls for slide change, remote stop/start for recorder mechanism, and coding for recording synchronising pulses.

The Slide-o-Matic is constructed in a two-piece plastic case, and incorporates electronic components mounted on a single printed circuit board together with a miniature relay. It measures 5 x 3 inches, and costs 17 guineas.

C. E. Hammond & Co. Limited, 90, High Street, Eton, Windsor, Berkshire.

LONGER-LIFE BATTERY BY RAY-O-VAC

A NEW Super 7 penlight battery designed for transistor and electronic equipment is announced by Ray-O-Vac (U.K.) Ltd. With a 1½ voltage, it is claimed to have up to 50 per cent longer life than standard penlight batteries.

Protected by a highly laminated outer label which covers another wrapping, it is also double-sealed with a steel top and inner asphaltic seal. The price is 7d.

Ray-O-Vac also recently announced a reduction in price for their 3LP Heavy Duty battery from 1s. 8d. to 1s. 6d.

Ray-O-Vac (U.K.) Limited, 363, Oxford Street, London, W.1.

YOUR LOCAL DEALER SCOTLAND

GLASGOW

Tape Recorder Specialists

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

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

RECORDING MACHINES LTD.

60 ST. VINCENT STREET, GLASGOW, C.2
Telephone: City 3847/8

THE NORTH

CUSSINS & LIGHT LTD.

YORK'S LEADING RADIO TV & ELECTRICAL STORE

Visit our First Floor
TAPE RECORDER CENTRE

LARGEST RANGE OF RECORDERS & ACCESSORIES IN THE NORTH

KING'S SQ. YORK



TAPE RECORDER CENTRE (Halifax)

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

30 King Cross St., Halifax. Phone 66832

TAPE-TO-DISC SERVICES

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

TAPE Bookshop offers YOU the kind of books other Tape Recordists have most requested!

Check through this list. Normal retail prices—we pay the postage on all orders.

3. **A to Z in Audio** by Gilbert A. Briggs (1960). 224 pages, 160 illustrations. **15s. 6d.**
A first-class book of reference for the subject.
4. **Audio and Acoustics** by Gilbert A. Briggs (1963). 168 pages, 140 illustrations. **12s. 6d.**
Acoustical Consultant James Moir as sub-editor. A revised but basically original work from the well known "Sound Reproduction."
5. **Audio Biographies** by Gilbert A. Briggs and 64 collaborations (1961). 344 pages, 112 photographs and illustrations. **19s. 6d.**
7. **Cabinet Handbook** by Gilbert A. Briggs (1963). 112 pages, 90 illustrations. **7s. 6d.**
Intended for the do-it-yourself man, and contains vital information on design and acoustic principles particularly in relation to compact enclosures which are now so popular for stereo.
8. **Direct Current and Magnetism.** Edited by Edgar J. Black (1964). 120 pages, 92 illustrations. **10s. 6d.**
Gives a very simple account of basic electrical theory.
10. **High Fidelity Pocket Book** by W. E. Pannett. 304 pages. **40s.**
Clear explanations of each item in the chain of a high fidelity installation are accompanied by practical hints for the enthusiast.
11. **High Fidelity Sound Engineering** by Norman Crowhurst. 336 pages, 262 illustrations. **50s.**
Comprehensive coverage on the engineering of modern single-channel and stereophonic sound equipment.
27. **Stereo and Hi-Fi as a Pastime** by Douglas Gardner (1959). 148 pages. **15s.**
15. **Loudspeakers (Fifth edition)** by Gilbert A. Briggs (1963). 336 pages, 230 illustrations. **25s.**
All aspects of the design and performance of loudspeakers and enclosures are dealt with in non-technical terms.
20. **More About Loudspeakers** by Gilbert A. Briggs (1963). 136 pages, 112 illustrations. **8s. 6d.**
Deals with the latest trends in non-technical terms, and takes a new look at questions such as response and impedance, load matching, adding a speaker, listening tests, stereo.
36. **The Grundig Book** by Frederick Purves. Comprehensive 1964 edition. **15s. 6d.**
Includes working instructions and data sheets for individual Grundig models.
37. **Tape Recording for Pleasure** by Wallace Sharps. 128 pages. **3s. 6d.**
38. **Ribbons of Sound** by Karl Barleben. A U.S.A. 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.**
29. **Tape Recording and Hi-Fi** by Douglas Brown (1961). 160 pages. **5s.**
Now as a paperback this interesting book by the Editor of "TAPE Recording Magazine" is very good value.
33. **You and Your Tape Recorder** by Norman Paul (1962). **4s.**
Very good value by a past winner of the British Amateur Tape Recording Contest.
12. **High Fidelity Sound Reproduction (Second edition).** Edited by E. Molloy. 212 pages. **20s.**
Contains a mass of valuable data for the serious amateur, and the maintenance engineer, and covers the expensive and complex equipment now on the market. Chapters on amplifiers and preamplifiers, dynamic loudspeakers.
25. **Sound Recording Works Like This** by Clement Brown. Illustrated. **10s. 6d.**
Part of "Science Works Like This" Series the book is intended for the younger members of the family.
39. **Tape Recorder Manual** by Wallace Sharps. (New cheap edition). **10s. 6d.**
Sections on its uses in business, education and pleasure, how it works, etc.
2. **Alternating Current and Acoustics.** Edited by Edgar J. Black (1964). 116 pages, 86 illustrations. **10s. 6d.**
Deals in simple terms with the origin and generation of alternating current, construction of coils and capacitors. The second part deals with the nature of acoustics and construction and operation of devices used for sound recording and reproduction.
21. **Practical Hi-Fi Handbook** by Gordon J. King. 224 pages. **25s.**
A guide to choice, installation and servicing of equipment, for dealer, engineer, and amateur enthusiast.
22. **Practical Stereophony** by H. Burrell Hadden (1964). 159 pages. **37s. 6d.**
The author, an instructor at the BBC, has been actively engaged for many years in research in this field, as a result the book is mainly directed towards those who make this art their profession, but there is much for the amateur enthusiast.
35. **Tape Recording Yearbook 1965.** **7s. 6d.**
The 1965 edition contains all the well-known facts and figures of earlier editions, revised to date, as well as important contents vital to all interested in this field. Compiled by the staff of "TAPE Recording Magazine" this Yearbook is a must.

TAPE HANDBOOKS

no newcomer to the hobby, or enthusiast, should be without!

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

2s. 6d. (U.S.A. \$0.65) post free.

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

Introduction to the Tape Recorder by C. Langton.

3s. 6d. (U.S.A. \$0.75) post free.

Also, ideal for the apprentice in Radio servicing.

Sound Effects on Tape by Alan Edward Beeby.

3s. 6d. (U.S.A. \$0.75) post free.

How to achieve realistic effects simply and economically.

Tape and Cine by John Aldred.

3s. (U.S.A. \$0.70) post free.

With practical advice on synchronising methods, etc.

How to Record Weddings by Paul Addinsell.

3s. (U.S.A. \$0.70) post free.

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

Hi-Fi for the Music Lover by Edward Greenfield.

3s. (U.S.A. \$0.70) post free.

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

REMITTANCE MUST ACCOMPANY ORDERS!

TAPE

BOOKSHOP

Catalogue numbers may be used when ordering

Catalogue numbers may be used when ordering

MAIL ORDER ONLY

7 TUDOR STREET, LONDON, E.C.4

Cheques & postal orders should be made payable to Print & Press Services Ltd.

NORMAL RETAIL PRICES
NO CHARGE FOR POSTAGE



News from the Clubs

BATH

Three sixty-minute feature programmes were recorded and relayed to Bath Hospitals during the Easter recess of the Bath Sound Recording Society. John Fishlock and Harry Skilliter produced the first programme "Anything Can Happen" which introduced a musical trip around the world; Chris Griffie recorded "Please do not disturb—3," a programme of guest artists disturbed by music; and all club members contributed to "Club Time—2" which included a "Juke Box Jury" interlude.

Secretary: C. J. Griffie, 26, Court Farm Road, Willsbridge, Bristol, Gloucestershire.

COTSWOLD

A visit by Mr. George Pontzen of Lustraphone Ltd. was the highlight of the May 10 meeting of the Cotswold society. During his visit Mr. Pontzen spoke about microphone design and construction, and demonstrated a number of his company's instruments. Stereo recordings were made using the Lustraphone coincident ribbon units, and this was followed by a demonstration of the Radiomic which incorporates a miniature radio transmitter. Finally, Mr. Pontzen demonstrated his noise-cancelling microphone—a great favourite among club demonstrations. With the members stamping, cheering, clapping and whistling around him, Mr. Pontzen spoke quietly into the microphone. Playback revealed a signal heard clearly against a faint background of noise.

During the interval members heard of an interview with club secretary Peter Turner recorded by Brian Roberts of B.B.C., Bristol. The programme was broadcast in the West Regional "Round-up" series, and concerned the society's monthly taped programme "Cotswold Roundabout," now some sixty editions old.

By arrangement with the Tape Reading Service for the Blind, the programme is now heard by an additional 200 blind persons either individually or in groups, in the United Kingdom, and is also sent out to listeners in South Africa, Canada and New Zealand.

Secretary: Peter D. Turner, Pike Cottage, Frampton Mansell, Stroud, Gloucestershire.

FERROGRAPH OWNERS

A get-together of members of the newly-formed Ferrograph Owner's tape club was held during the recent four-day Audio Fair at the Hotel Russell. Attending from various parts of the country, this was the first opportunity allowing members to meet face to face.

Membership is reported to be growing fast, and more round robin tapes are to be circulated to the newcomers. A special tape, to be circulated to members' wives, is planned, and an identification badge is to be manufactured for members.

Secretary: R. D. Little, "Kingswood," Silverne Drive, Ellesmere Port, Cheshire.

GLASGOW

Five members of the Tape Section of the Radio Club of Scotland were able to visit the recent Audio Fair. After their 400-mile journey they toured the stands recording interviews and taking colour photographs of the exhibits.

At the first meeting after the Fair,

the programme compiled from this material was presented to those unable to journey to London.

Among recent activities have been a "Machines Night," enabling members without recorders to operate and inspect some of the wide range of models owned. At an earlier meeting, portable models were on show, and groups were formed to collect various location sounds for later playback and criticism.

A lecture on producing a tape/slide show has also been a recent feature. More recent meetings included a "Bring-a-Tape" session, suitable tapes being selected for entry into the British Tape Recording Contest.

A lecture on connecting plugs and sockets is planned, and discussion on various location recording activities are being held for the summer months. Secretary: J. A. Douglas, 113, Novar Drive, Hyndland, Glasgow, W.2, Scotland.

GREAT YARMOUTH

A change of secretary is announced for the Great Yarmouth society following the move from the district of Mr. Wykes.

Leonard Ask has filled the vacant position. His address is 7, High Street, Gorleston, Great Yarmouth, Norfolk.

NATIONAL FEDERATION

A cross-section of the locally-formed clubs in this country were represented at the Annual General Meeting of the Federation of British Tape Recording Clubs, held at the Hotel Russell, London, on May 15.

Proxy votes were received from the clubs in Darlington and Boston, and voting took place for the election of a new committee. E. Roger Aslin relinquished his long-held post as secretary, although he remains on the Committee. A. Highcazony was elected to fill the post.

A nine-man committee was elected and given instructions to pursue the activities of the Federation even more actively than in the past. Special attention is to be given to recording in schools, and Douglas Morris, secretary of the London club, undertook the special task of investigating further the position of the amateur recordist with regard to copyright.

Other new elections included G. M. Webb who replaces Fred Gazley as Treasurer. Mr. Alan Stableford is to continue in office as Federation Chairman.

Secretary: A. Highcazony, 101, Roseville Road, Hayes, Middlesex.

NEWCASTLE

Latest report of the long-unheard-of Newcastle tape society suggests the club still flourishes.

Most ambitious of their ventures has been the attempt at drama production, which was to have been completed in two meetings. No report to date of success or otherwise. Other activities have included a lecture on microphone technique, and two evenings devoted to theoretical and practical session of recording a tape to an overseas tape club.

Demonstrations of manufacturers' and members' equipment have been held, together with the more practical production of various sound effects.

In June members' field recordings are to be judged and a "Silver Eggcup" presented to the winner.

Secretary: D. A. Wright, 10, Elsdon Road, Grange Estate, Wickham, Co. Durham.

NORTH LONDON

Police whistles, sirens, radio cars and "999" calls were most predominant in the five entries received for the North London tape club's "Crime Story in sound" tape competition organised during March. David Barker was eventually declared

the winner, having competed with five tapes of a generally high standard.

More recently, members held an informal evening during which home-built equipment was shown and demonstrated. This May 19 meeting was to include mixers, amplifiers and tape recorders.

For their May 26 meeting, the committee had arranged for attendance of bandsmen to provide practical recording experience of band recordings. This was to be followed on June 2 with a discussion on microphones. The AKG range of units were being loaned for the evening, and a parabolic reflector was to be shown and demonstrated.

Their next competition is to be an open one with a time limit of five minutes.

Secretary: John Wilson, 202a, North End Road, Fulham, London, W.14.

PLYMOUTH

Terry Ellis, former member of the Plymouth tape club writes to report that the club has ceased to function.

READING

"Do you want evening newspapers?" was the question asked of Reading citizens during another of the local tape club's "Out-and-about" ventures with portable tape recorders.

Douglas Noyes, the society's new chairman, chose the topical questions as Thomson Newspapers will shortly be launching the *Evening Post* in the area. Mr. Marcus Davidson, news editor of the new paper, spoke to members before the recording exercise began, giving them an interesting insight into this up-to-the-minute publication.

Lively interviews were reported by members during their tour of cafés, hotels, stations and bus queues, asking questions such as "What would you most like to see in your evening paper?" We have no authentication of one reply alleged to be: "Fish and chips."

Secretary: Mrs. Rita Noyes, 4, Foxfield Avenue, Reading, Berkshire.

STOCKTON

The first meeting of the "Elmwood Tape Club" was held on April 23. Over twenty-five prospective members attended to see and hear a demonstration given by local dealers Messrs. Sparksound.

Fortnightly meetings have been arranged, and these are to be held at the Elmwood Community Centre, Hartburn, Stockton. During the evening the members elected Mr. John Flint as Chairman, Fred J. Hay as secretary, and Miss Pat Bootland as treasurer.

Secretary: Fred J. Hay, 27, Crayke Road, Stockton-on-Tees, Co. Durham.

THANET

Over 140 interviews have been collected by members of the Thanet International Recording Society for their documentary feature tape on the Isle of Thanet. Among famous voices recorded is that of Bill Speakman, V.C., of Korean war fame. The feature is nearing completion.

Ray Jarvis and Bunny Austen have also been busy producing a regular tape programme of entertainment for Old Age Pensioners in the area. A gigantic float has been designed and is being constructed in preparation for the summer carnivals. The society intends entering every carnival between Birchington and Folkestone.

The society is currently negotiating for a trip on the Dover-Dunkirk car ferry m.s. *Free Enterprise*, and Charles Brown and George Watson were recently on safari "at Waterloo Station collecting sound effects for another club documentary."

Chairman Charles Brown has recently been listing available tape and disc records for use in the society's

hospital programme and sound magazines.

Secretary: Ray Jarvis, "Studio One," Woodland Avenue, Birchington, Kent.

TAPE EXCHANGES

TAPE recorder owners who wish to contact others with similar interests, to exchange news and views by tape are invited to fill in and return the form on page 288, giving their name, age, address, special hobby or interest for this section.

Details given here also include speeds and spool size to be used, name of recorder, and special area to be contacted.

Doobson, Ian R. (24). 58, Brownwood Road, Finsbury Park, London, N.4. Cine photography, films, music. 7½, 3½, 1½ ips. Seven-inch spool. Fidelity (four-track), Challenge and Steelman Transi-tape portable. Male contacts preferred.

Duxbury, John (26). 42, Walton Lane, Barrow-in-Furness, Lancashire. Do-it-yourself construction, light classical and pop music. 7½, 3½, 1½ ips. Seven-inch spool. Simon SP5 and RGD Mk 103. Australasia, Canada, Europe, USA.

Garner, Graham (37). 33, Greenacres Avenue, Ickenham, Uxbridge, Middlesex. Architecture, modern jazz. 3½ ips. Seven-inch spool. Cossor CR1602, four-track. USA, Scandinavia, France.

Heard, Brian M. (32). 34, Church Hill, Loughton, Essex. Civil Defence, all music. 7½, 3½ ips. Seven-inch spool. Sony stereo, and Philips recorder. South Africa, UK, Australia.

Hillier, Ronald E. (32). 9, Belmont Grove, Chiswick, London, W.4. 7½, 3½, 1½ ips. Seven-inch spool. Fidelity Playmaster Major, four-track. Female contacts preferred.

OVERSEAS READERS

Binder, George (35). P.O. Box 10362, Johannesburg, South Africa. Photography, cine, pop music. 7½, 3½, 1½ ips. 7-inch spool. Grundig TK24, four-track.

Bitheh, Len (22). 3529360, 18 Squadron, RAF Gutersloh, B.F.P.O. 47. Round-robin tapes, pop and show music. 3½, 1½ ips. 7-inch spool. Philips EL3548 and EL3547, four-track. New Zealand, West Indies, UK, USA, Australia.

Cross, David J. (20). 12408 Sarah Street, North Hollywood, California, USA. Live performances of opera and classical music.

du Plessis, D. D. (33). P.O. Box 880, Bloemfontein, Orange Free State, South Africa. Photography, music. 3½ ips. 7-inch spool. Philips EL3541, four-track.

Jolley, Arthur J. (38). 8765 Innsdale, Spring Valley, California 92077, USA. Photography, science. 7½, 3½ ips. 7-inch spool. Roberts recorder.

Kanton, Erkki (20). Kapytie 23, Tampere, Finland. Theatre, all music. 7½, 3½, 1½, 15/16 ips. 7-inch spool. Philips EL3549. English speaking contacts only.

Kerr, T. M. (40). Box 124, P.O. Camperdown, Victoria, Australia. Photography. 3½ ips. 5-inch spool. Monarch recorder.

Kilbourne, John H. (24). 7, Brook Bridge Road, Great Neck, New York, USA. Literature, England, hi-fi music. 7½, 3½ ips. 7-inch spool. Viking 88 recorder.

Lanford, Hank (38). Route One, Woodruff, South Carolina, USA. Stereo recording. 7½, 3½ ips. 7-inch spool. Ampex F4460.

Loader, Colin (27). P.O. Box 563, Paradys, Bloemfontein, South Africa. Cinema, magic, hi-fi, light classical music. 7½, 3½, 1½ ips. 7-inch spool. Akai M7. UK, USA, Japan.

CLASSIFIED ADVERTISEMENTS

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

TAPE EXCHANGES

(Continued from page 287)

Lloyd, Sgt. M. (31). 9112 Royal Lancers, B.F.P.O. 36, Germany. Camping, audio. 7½, 3½, 1½ ips. 8½-inch spool. Ferrograph 5AN.
Nezaki, Kenichi (21). 1-383 Koiwa-Machi, Edogawa-Ku, Tokyo, Japan. Golf, music. 7½, 3½, 1½ ips. 7-inch spool. Sony recorder. English-speaking areas only.
Nicholson, H. W. (31). Combinatul de Celuloza, Calaraski, Rumania. 8mm cine, skin-diving. 7½, 3½, 1½ ips. 7-inch spool. Robuk RK44.
Richardson, Edward (?). 13, O'Leary Road, Kilmainham, Dublin, Eire. English and French languages, reading. 3½ ips. 5-inch spool. Philips EL3514, four-track. Europe (Esp. France and Belgium). Male contacts only, letters first please.
Snowden, R. (22). R.H.Q. 47, Regiment, B.F.P.O. 20. Photography, jazz and pop music. 3½, 1½ ips. 3½-inch spool. Standard Unicorder. Female contacts preferred in Germany.

TEENAGE READERS

Bradford, Andrew (16). 52, Claremont Street, London, N.18. Politics, walking, pop music. 7½, 3½, 1½ ips. 7-inch spool. Gainsborough Mk 1. UK.
Burkitt, Michael (16). 65, Fromond Road, Winchester, Hampshire. Photography, hi-fi. French pop music. 7½, 3½, 1½ ips. 8½-inch spool. Ferrograph 631, Grundig TK5. Female contacts preferred in France, Luxembourg, Belgium.
Cragg, Alan Charles (19). E/72 Mess, H.M.S. Drake, Plymouth, Devon. Sound effects, band music, fishing. 7½, 3½ ips. 8½-inch spool. Ferrograph Series 5 and 6.
Crouch, Alan (17). 1, Mayfield Villas, Cray Road, Sidcup, Kent. Radio, cars, pop music. 15, 7½, 3½ ips. 7-inch spool. Collaro Transcrip-tor. Female contacts, same age, required in Kent, Essex. Letters first please.
Eyre, Antony (9). 48, Davenport Road, Derby, Derbyshire. Sport, history, pop music. 3½, 1½ ips. 7-inch spool. Cosor CR1604, four-track. Australia, New Zealand, UK, USA.
Ferguson, Bill (16). 9, Warrington Street, Blackburn, Lancashire. Colour photography, music. 3½ ips. 5½-inch spool. Fidelity Argyll Minor 4. Overseas only.
Harris, David J. (17). 66, Llandudno Road, Cardiff, South Wales. Church work, classical music. 7½, 3½, 1½ ips. 7-inch spool. Magnavox TM840, four-track. UK only.
Hill, Barry (16). 74, Hummershill Lane, Marske, Redcar, Yorkshire. Chess, microscopy. 3½ ips. 5½-inch spool. Bush TP50. USA, USSR. Female contacts only.
Hutchinson, Peter J. (15). 36, Erica Road, Heatherlands, George, South Africa. Photography, reading, pop music. 3½ ips. 5-inch spool. Philips EL3514, four-track. USA. Letters first please.

Jewell, Norman (19). 16, Walsingham Road, Addington, Croydon, Surrey. Photography, Goon humour, all music. 7½, 3½, 1½ ips. 7-inch spool. Philips EL3542. Female contacts, same age, in UK.
Johnson, Brian (16). 34, Phillips Street, Birmingham 6, Warwickshire. 3½ ips. 7-inch spool. Philips recorder.

Kimberley, Steven (13). 50, Barnbrook Road, Sarisbury, Southampton. Photography, French language, swimming, music. 3½ ips. 5½-inch spool. Fidelity Playmaster. Female contacts in France.
Macmillan, Ian (16). 277, Cambusnethan Street, Wishaw, Lanarkshire. 8mm cine, railways, pop music. 3½, 1½ ips. 7-inch spool. Philips EL3548.
Redhead, Christopher (16). 4, Bianbridge Road, Doncaster, Yorkshire. Photography, radio and TV stations, pop music. 3½ ips. 5½-inch spool. Grundig TK18. USA, Europe, UK (not N. England).

Roberts, P. E. (14). 13, Atheling Road, Hythe, Hampshire. Electronics, go-karts, cycling. 3½ ips. 5½-inch spool. Telefunken Automatic. Contacts same age required.
Schroer, Manfred (16). Daimler-twiete 7, 2 Hamburg 50 (Altona), Germany. Travel, literature, politics, trad jazz and classical music. Contacts between 20-30 required.
Slaughter, Keith (17). 113, Hare-beating Drive, Haisham, Sussex. Travel motor-cars, pop music. 3½ ips. 7-inch spool. Stella ST454, four-track. USA, Continent.

Stevens, Mike L. (19). 29, Kingshurst Road, Lee, London, S.E.12. Travel, music, cars. 7½, 3½, 1½, 15/16 ips. 5-inch spool. Uher 4000 Report, battery portable. Europe.
Stohart, John (16). 286, Ardenraig Road, Glasgow S.5, Scotland. Photography, radio, electronics, pop music. 3½ ips. 5½-inch spool. Grundig TK14. France, USA, UK.

Welch, Robert (17). Brookside, Tuxford, Newark, Nottinghamshire. Pop music. 3½ ips. 5½-inch spool. Sobell recorder. USA.
Woolf, Michael (18). 6, Arundel Way, Newquay, Cornwall. Cine, cinema, amateur dramatics. 7½, 3½, 1½ ips. 7-inch spool. Dynatron Cordova TRP1. Same age contacts in UK, USA, Europe.

Woolf, Michael (18). 6, Arundel Way, Newquay, Cornwall. Cine, cinema, amateur dramatics. 7½, 3½, 1½ ips. 7-inch spool. Dynatron Cordova TRP1. Same age contacts in UK, USA, Europe.

Woolf, Michael (18). 6, Arundel Way, Newquay, Cornwall. Cine, cinema, amateur dramatics. 7½, 3½, 1½ ips. 7-inch spool. Dynatron Cordova TRP1. Same age contacts in UK, USA, Europe.

Woolf, Michael (18). 6, Arundel Way, Newquay, Cornwall. Cine, cinema, amateur dramatics. 7½, 3½, 1½ ips. 7-inch spool. Dynatron Cordova TRP1. Same age contacts in UK, USA, Europe.

Woolf, Michael (18). 6, Arundel Way, Newquay, Cornwall. Cine, cinema, amateur dramatics. 7½, 3½, 1½ ips. 7-inch spool. Dynatron Cordova TRP1. Same age contacts in UK, USA, Europe.

Woolf, Michael (18). 6, Arundel Way, Newquay, Cornwall. Cine, cinema, amateur dramatics. 7½, 3½, 1½ ips. 7-inch spool. Dynatron Cordova TRP1. Same age contacts in UK, USA, Europe.

FAMILY EXCHANGES

Beale, Michael and fiancée Wendy Topham (25 and 18). 54, Montague Street, Swindon, Wiltshire. 35mm photography, youth work, choral training, organ, classical and pop music. 7½, 3½, 1½ ips. 7-inch spool. Robuk RK3. UK, New Zealand, Canada.
Ellon, Ivan and Alice (37). 4, Cuneene Road, Emmerentia, Johannesburg, South Africa. 8mm cine and 35mm photography. 3½ ips. 5-inch spool. Philips recorder.
Moran, Brian and Patricia (35/32). 28, Pearl Road, Walthamstow, London, E.17. 16mm cine, philately. 15, 7½, 3½, 1½ ips. 8½-inch spool. Brenell Mk 5, Type M, English speaking contacts in Holland, Germany, UK.

Ellon, Ivan and Alice (37). 4, Cuneene Road, Emmerentia, Johannesburg, South Africa. 8mm cine and 35mm photography. 3½ ips. 5-inch spool. Philips recorder.
Moran, Brian and Patricia (35/32). 28, Pearl Road, Walthamstow, London, E.17. 16mm cine, philately. 15, 7½, 3½, 1½ ips. 8½-inch spool. Brenell Mk 5, Type M, English speaking contacts in Holland, Germany, UK.

Ellon, Ivan and Alice (37). 4, Cuneene Road, Emmerentia, Johannesburg, South Africa. 8mm cine and 35mm photography. 3½ ips. 5-inch spool. Philips recorder.
Moran, Brian and Patricia (35/32). 28, Pearl Road, Walthamstow, London, E.17. 16mm cine, philately. 15, 7½, 3½, 1½ ips. 8½-inch spool. Brenell Mk 5, Type M, English speaking contacts in Holland, Germany, UK.

MISCELLANEOUS

HIGHEST CASH PRICES offered for good quality Tape Recorders and Hi-Fi. See our advert., page 262, this issue. R.E.W., 266-8, Upper Tooting Road, London, S.W.17.

Speedy and Expert Tape Recorder and Hi-Fi Repairs by England's leading Hi-Fi Specialists.—Telesonic Ltd., 92, Tottenham Court Road, London, W.1.

YOU ought to send for a copy of "Psychology and Whisper Teaching" to 2, York House, Huddersfield—5s. 9d. post free.

NEW EQUIPMENT

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

TAPE RECORDS

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.

MUSIC ON TAPE LTD. Catalogue of tape records, and nearest stockist, on request. Music on Tape Ltd., 9, Kew Green, Richmond, Surrey.

PIANOFORTE TUITION. Revolutionary method for adult beginners, made possible by tape-splicing. All lessons individually recorded to suit requirements. Tape and music supplied. Moderate terms — WRITE for DEMONSTRATION TAPE available ON FREE LOAN. P. L. Mulvey, M.I.M.I.T., 88, Dover Rd., Northfleet, Kent.

THE SLEEP-LEARNING ASSOCIATION. Details of membership, tapes, subjects, equipment, residential facilities, from the Association, 14, Belsize Crescent, N.W.3. Tel.: SWI 6160.

TAPE DUBBING

J. & B. RECORDINGS. Tape/disc. Mobile unit. Quality recording. 14, Wiltham 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.

RAPID Recording Service. Records made from your own tapes (48-hour service). Master discs and pressings. Recording Studio—Demo discs. Mobile recordings, any distance. Brochure from: 21, Bishops Close, E.17.

RECORDING STUDIO, mobile unit, tape/disc. 78/45/33½. Brochure, price list on request: Nailor Recordings, 19, West St., Sittingbourne, Kent. Sittingbourne 3117.

SOUNDTRACKS LTD. High Speed Tape-to-Tape copying. Soundtracks Ltd., 9, Kew Green, Richmond, Surrey. Richmond 7368.

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 Dero Sound Service, 52, Hest Bank Lane, Hest Bank, Lancaster. Tel.: H.B. 2444.

Tape to Disc Recording Service, photographic sleeves with all recordings. High speed tape copying. E.R.S., 162, Shirland Road, London, W.9.

MAGNETIC TAPE

A UNIQUE BUY! Recording tape top brand, 7-inch 2,400 ft. DP, 25s.; 5½-inch 1,200 ft., 19s. 6d. P & P 1s. 6d. per list. Bargains in all sizes. S.a.e. for list. We repair, buy and sell recorders. E. C. Kingsley & Co. Ltd., 132, Tottenham Court Road, London, W.1. EUSton 6500.

LAFAYETTE "INTERNATIONAL" TAPE. Polyester: 7-inch 2,400 ft. 22s. 6d.; 5½-inch 1,800 ft. 20s.; 5-inch 1,200 ft. 14s.; 7-inch 1,800 ft. 19s.; 7-inch 1,200 ft. 12s. Acetate: 7-inch 1,800 ft. 14s. 9d.; 5-inch 900 ft. 10s. 6d.; 5-inch 600 ft. 8s. Refund guarantee. "Bib" Tape Splicer, 14s. 11d. We also have a full range of Message Tapes and Triple Play Tapes all at lowest-ever prices. P. & P. 2s. per order. S.A.E. list. Leda Tapes, 27, Baker Street, W.1.

TAPE EXCHANGES

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

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

"TAPEMATES INTERNATIONAL" opens the world to you! Club and recording booths, 6 p.m.-10.30 p.m. except Mondays, 6, Holland Park Avenue, W.11.

FOR SALE

Commercial tape players, console model, twin tracks, 15-watt amplifier. Bargain! £65 each. Limited stocks. Box No. 454.

Pre-Sleep study. Learn difficult lessons or parts or improve your mental powers while you sleep! Send now for Price List of materials including the perfect Tape Machine, Time Switch, Pillow Speakers, Endless Tape Cassettes, Pre-recorded Tapes for learning or Therapy, Language Courses, etc.—Psychology Tapes Limited, Dept. TRM, 16, Kings College Road, London, N.W.3. PRI 3314.

£85 UHER 4000 Report-S! Battery portable, four speed with M512 slip/start dynamic remote control microphone and 15 ft. extension cable and Ever Ready carrying case. BRAND NEW IN CARTON and complete with guarantee. Cost 114 gns. Will sell for £85. B. R. Townsend, Manor Lodge, Wistaston Manor Drive, Nantwich Road, Crewe, Cheshire.

Index to Advertisers

A. Brown & Sons Ltd.	291
Adastra Electronics Ltd.	291
Agfa Ltd.	Back cover
Berean Forward Movement	289
Brenell Engineering Co. Ltd.	258
City and Essex Tape Recorder Centres	259 and 282
Cussins & Light Ltd.	285
Data Publications Ltd.	278
Daystrom Ltd.	280
Educational Recordings Ltd.	289
Fairbotham & Co. Ltd.	283
Francis of Streatham	276
Global Products	289
Gramplan Reproducers Ltd.	276
Hightgate Acoustics	260
Howard Tape Recorders	278
Ilford Ltd. (Zonal Products)	270
Kodak Ltd.	262
K. J. Enterprises	276
Lee Electronics	282
Magnagraph	282
Massey's Centre of Sound	283
Rapid Recording Service	285
Recording Machines Ltd. 284 and 285	284
Resolound Ltd.	264
R.E.W. Earlsfield Ltd.	262
Sheen Tape Recorder Centre Ltd.	283
Tape Recorder Centre (Halifax)	285
Tel-Lee-Radio	283
The Ferrograph Co. Ltd.	263
The Recorder Co.	291
Tom Molland Ltd.	284
Tysonic	284
U.N.A.M.E.C.	261
Wharfedale Wireless Works Ltd.	265
Worthing Tape Recorder Centre	284

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

Name Age

Address

Special interests

Speeds to be used Maximum spool size

Recorder owned

Special areas to be contacted

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

GLOBAL PRODUCTS

- GLOBAL BULK ERASER Mk. 2. High performance. Simple to operate. Suitable for all tape sizes. £5 2s.
 - GLOBAL TAPE HEAD CLEANING TOOL. 5s. 3d.
- PRE-RECORDED TAPES.** Most well-known manufacturers: Music-on-Tape, Recotape, World Record Club, PLUS the new range of Global Tapes in the 12s. to 15s. price range. Send for our lists.

MAIL ORDER ONLY

14, UNDERWOOD ROAD, ROTHWELL, NORTHANTS.

HOW TO MAKE MONEY WITH YOUR TAPE RECORDER!

It's the title of a NEW Handbook by David Haines in our popular, down-to-earth tape series. Tells you how to go about getting assignments and turning ordinary social and domestic events into hard cash. Makes it clear that you don't need to be a professional to make tape recordings which will sell on tape or disc.

Price 3/6 **TO BE RELEASED IN A FEW WEEKS!**
Orders are NOW being accepted.

Send cheque or postal order to the publishers:—

PRINT & PRESS SERVICES LTD., 7 TUDOR STREET, LONDON, E.C.4

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., "Eastgrove," Marsham Way, Gerrards Cross, Bucks.

"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 the

.....
.....
(product) mentioned on page.....of the
..... issue of TAPE
Recording Magazine.

NAME.....

ADDRESS

July 1965

I should like further information about the

.....
.....
(product) mentioned on page.....of the
..... issue of TAPE
Recording Magazine.

NAME.....

ADDRESS

July 1965

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 the

.....
.....
(product) mentioned on page.....of the
..... issue of TAPE
Recording Magazine.

NAME.....

ADDRESS

July 1965

I should like further information about the

.....
.....
(product) mentioned on page.....of the
..... issue of TAPE
Recording Magazine.

NAME.....

ADDRESS

July 1965

I should like further information about the

.....
.....
(product) mentioned on page.....of the
..... issue of TAPE
Recording Magazine.

NAME.....

ADDRESS

July 1965

POST COUPON NOW!

To: **TAPE Recording Magazine, 7 TUDOR STREET, LONDON, E.C.4**

Please send me.....copy(ies) of **TAPE Recording YEAR BOOK 1965** at 7s. 6d. (\$1.25) a copy (incl. postage). I enclose remittance.

NAME

ADDRESS



TAPE YEAR BOOK 1965 the Recordist's Reference Book!

★ The only available up-to-date catalogue of **EVERY TAPE RECORDER** on the market with full specifications, price, etc., plus photographs.

Features include

- ★ Review of tape developments during the past year.
- ★ Function, maintenance and design of tape recorders.
- ★ Advice on correct use of Acoustics.
- ★ Producing a feature tape. ★ Recording as a Group activity.
- ★ Manufacturers, dealers and Club Secretaries' addresses.
- ★ GLOSSARY of technical terms, "at-a-glance" tabulated catalogues of microphones, radio tuners, mixer units and associated equipment.

PRICE
7/6

Latest edition on sale at bookstalls or direct from publishers using coupon above

CUT ALONG DOTTED LINE

POSTAGE
WILL BE
PAID BY
PRINT AND
PRESS
SERVICES
LIMITED

TAP
E
R
E
C
O
R
D
I
N
G
M
A
G
A
Z
I
N
E,
7,
T
U
D
O
R
S
T
R
E
E
T,
L
O
N
D
O
N,
E
C
4

B
U
S
I
N
E
S
S
R
E
P
L
Y
F
O
L
D
E
R
L
i
c
e
n
c
e
N
o.
N
D
9
2
2

THIRD FOLD HERE

SECOND FOLD HERE

FLAP A

N
O
P
O
S
T
A
G
E
S
T
A
M
P
N
E
C
E
S
S
A
R
Y
I
F
P
O
S
T
E
D
I
N
G
R
E
A
T
B
R
I
T
A
I
N
O
R
N
O
R
T
H
E
R
N
I
R
E
L
A
N
D

FLAP B

FIRST FOLD ALONG THIS LINE

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

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.14, 18 & 23	59/6
TK.1	49/6
TK.5	55/-
TK.6	67/6
TK.8	63/-
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/-*
T.K.830/3D	63/-*
Cub	35/-
Telefunken 85	65/-
75/15 & 76K	55/-
95 & 96	69/6
Philips 8108	57/6
EL3538	63/-
EL3542	63/-
EL3536	70/-
3534	87/-

Philips 3549	79/6
3585	57/-
3514	66/-
EL3515	57/6
EL3541/15	57/6
3541H	72/-
Cossor 1602	57/6
1601	63/-
1604	79/-
1605	84/-
Stella ST455	63/-
ST454	57/6
ST458	79/-
ST459	84/-
Saba	63/-
Elizabethan LZ29	75/-
FT.1	66/-
FT.3	75/-
TT.3	75/-
Fi-Cord IA...	52/6
Fidelity Argyll	55/-*
Clarion (with strap)	52/6
Brenell Mk. 5	77/-
3 star	69/-
Robuk RK.3	67/6
Sony 521	90/-
Ferroglyph	80/-
Revox	84/-
Optacord 412 & 414	63/-

*Without pocket.

A. BROWN & SONS LTD.

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

Synchrotape

BRAND

HIGH FIDELITY RECORDING TAPE



BRITAIN'S FINEST VALUE IN RECORDING TAPE
P.V.C. STANDARD, LONG, DOUBLE & TRIPLE PLAY

Adastra Electronics Ltd 167 Finchley Rd. London NW3

THE RECORDER CO.

for best machines on advantageous terms

	Deposit	12 Monthly Payments	Cash Price
	£ s. d.	£ s. d.	Gns.
4 TRACK STEREO/MONAUROL			
Cossor CR1607	6 0 0	4 9 9	57
Sony TC200	7 12 0	5 13 4	72
Beocord 1500	9 9 0	7 0 0	89
Philips EL3534	9 16 0	7 4 8	92
Tandberg 74	9 16 0	7 6 5	93
Sony TC500	11 5 0	8 5 0	105
Grundig TK46	11 7 0	8 8 4	107
Beocord 2000 T. Mod.	11 16 0	8 16 4	112
Beocord 2000 S Model	12 17 0	9 3 4	117
Akai M8	15 10 0	11 9 8	146
MAINS 2-TRACK			
Ferguson 3210	2 14 0	1 17 6	24
Philips EL3553	2 14 0	1 17 6	24
Wyndor "707 II"	3 12 0	2 10 0	32
Grundig TK18L	4 6 6	3 4 7	41
Tandberg 823	5 14 0	4 5 0	54
Reps R10 Mark II	6 4 0	4 12 11	59
Tandberg 92	7 5 0	5 8 8	69
Brenell Mark V Series 3	7 15 6	5 16 7	74
Truvox R102	8 0 0	5 19 8	76
Brenell 5/3 (Meter)	8 6 0	6 4 5	79
Ferroglyph 631	9 5 0	6 18 7	88
Brenell 5/3 "M"	9 16 0	7 6 5	93
Revox 736	13 4 0	9 15 0	124

	Deposit	12 Monthly Payments	Cash Price
	£ s. d.	£ s. d.	Gns.
STEREO TAPE UNITS			
Ferroglyph 632 2-T	12 15 0	9 9 7	120
Ferroglyph 634	12 15 0	9 9 7	120
Truvox PD104	9 9 0	7 0 0	89
Brenell STB 2/5/2-T	15 0 0	11 5 0	£150

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.

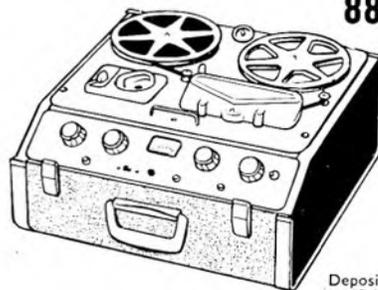
FREE DELIVERY
PART EXCHANGE

THE RECORDER CO.



FERROGRAPH 631

88 GNS.



Deposit £9.5.0
12 Monthly Payments
£6.18.7

Three Speeds 7½, 3½ and 1½ i.p.s. Housed in new presentation two-tone grey case with metal trim, and provided with an additional head position for stereo playback, lower track and monitoring.

Also available, Model 631H Speeds 3½, 7½ and 15 i.p.s. 92gns. Model 632 stereo with output monitor stage and built-in speaker 115 gns.

We will be pleased to demonstrate these fine models or send full details.

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

	Deposit	12 Monthly Payments	Cash Price
	£ s. d.	£ s. d.	Gns.
MAINS 4-TRACK			
Elizabethan Auto 4	2 19 0	2 4 1	28
Elizabethan LZ34	3 12 0	2 10 0	32
Ferguson Super 3212	3 10 0	2 11 11	33
Fidelity Major 4	3 13 6	2 15 2	35
Wyndor "707 IV"	3 13 6	2 15 2	35
Philips EL3548	4 2 0	3 1 5	39
Grundig TK17L	4 10 6	3 7 9	43
Grundig TK23L	5 9 0	3 16 8	49
Tandberg 843	6 4 0	4 12 11	59
Philips EL3549	6 12 0	4 17 6	62
Reps R10 Mark II	7 5 0	5 8 8	69
Truvox R104	8 6 0	6 4 5	79
Grundig TK40	9 4 0	6 16 11	87

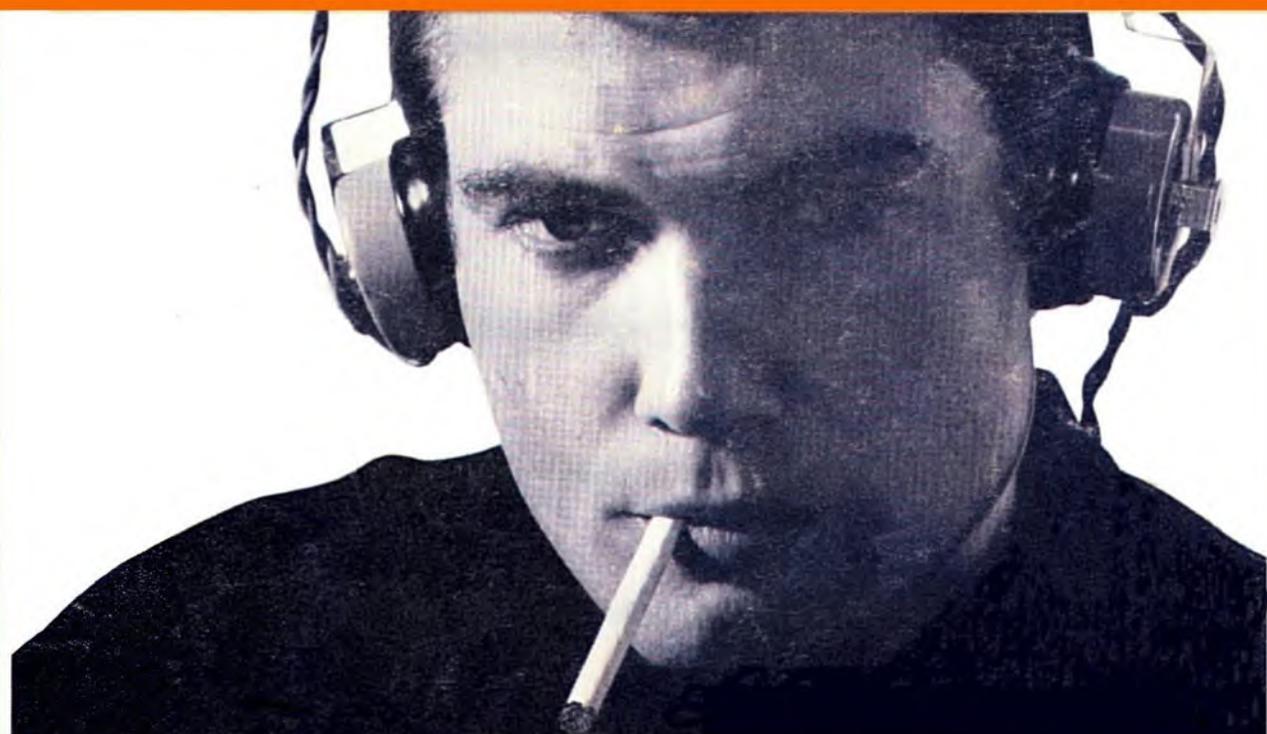
UNREPEATABLE OFFER

ELIZABETHAN AUTO 4

Automatic Record Level adjusts itself for perfect results every time. Monitor and Extension Amplifier connections. Straight-through amplification. Speed 3½ i.p.s. Wooden cabinet. 7" x 4" Speaker. 3½ watts output. Latest Model. Brand new. 12 Months Guarantee. Microphone, 5½" Tape and Radio Lead included. **Today's List Price 28 gns. 21 gns. or Deposit £2.5.0 and 12 monthly Payments of £1.14.8.**

BATTERY

	Deposit	12 Monthly Payments	Cash Price
	£ s. d.	£ s. d.	Gns.
Philips "Pocket"	2 16 6	2 0 10	26
Philips EL3586	2 16 6	2 0 10	26
Optacord 408 Bac/Mns	4 2 0	3 1 5	39
Telefunken 300	5 9 0	3 16 8	49
Ficord 202A	7 0 0	5 3 10	66
Grundig TK6 Bac/Mns	7 13 6	5 15 0	73
Uher 4000S Report	10 16 6	8 2 3	103



if it's true that one tape is as good as another, why do recording studios throughout the world insist on Agfa?

Stands to reason doesn't it? With money no object and the chance to choose what he wants, no discerning Engineer is going to pick Agfa tape unless it's the best. And when you consider that his Agfa tape is the same that you can buy in any shop and that it costs much the same as other tapes it must be best for you too. So look for the bright Agfa pack and remember—the one with the Agfa diamond is *your* best friend. Agfa Polyester recording tapes are available as long play, double play or triple play. The range is extensive from long play 210' with a playing time of 11 minutes for 9/- to 3,600' in triple play with a playing time of 3 hrs. 12 mins. for £5. 15. 0. A range of popular sizes are available in library cassettes. A splicing tape dispenser at 6/6, and accessory kit at 34/6 are useful extras.

FREE! MAGNETON ILLUSTRATED—an informative and lavishly produced colour magazine. Please write for your copy.



the world's most versatile tape

AGFA LTD, 27 Regent St, London S.W.1. Tel: Regent 8581
A product of Agfa-Gevaert A. G.