

TAPE

RECORDING MAGAZINE

MAY 1965

24



IN THIS ISSUE

● International Audio Festival and fair 1965

Stand-by-stand survey of exhibits

● Recording from TV

ALSO

Stereo recording in the field

Adding sound to cine films

TEST BENCH report on a new recorder

New Products

Clubs' News

Tape Exchanges

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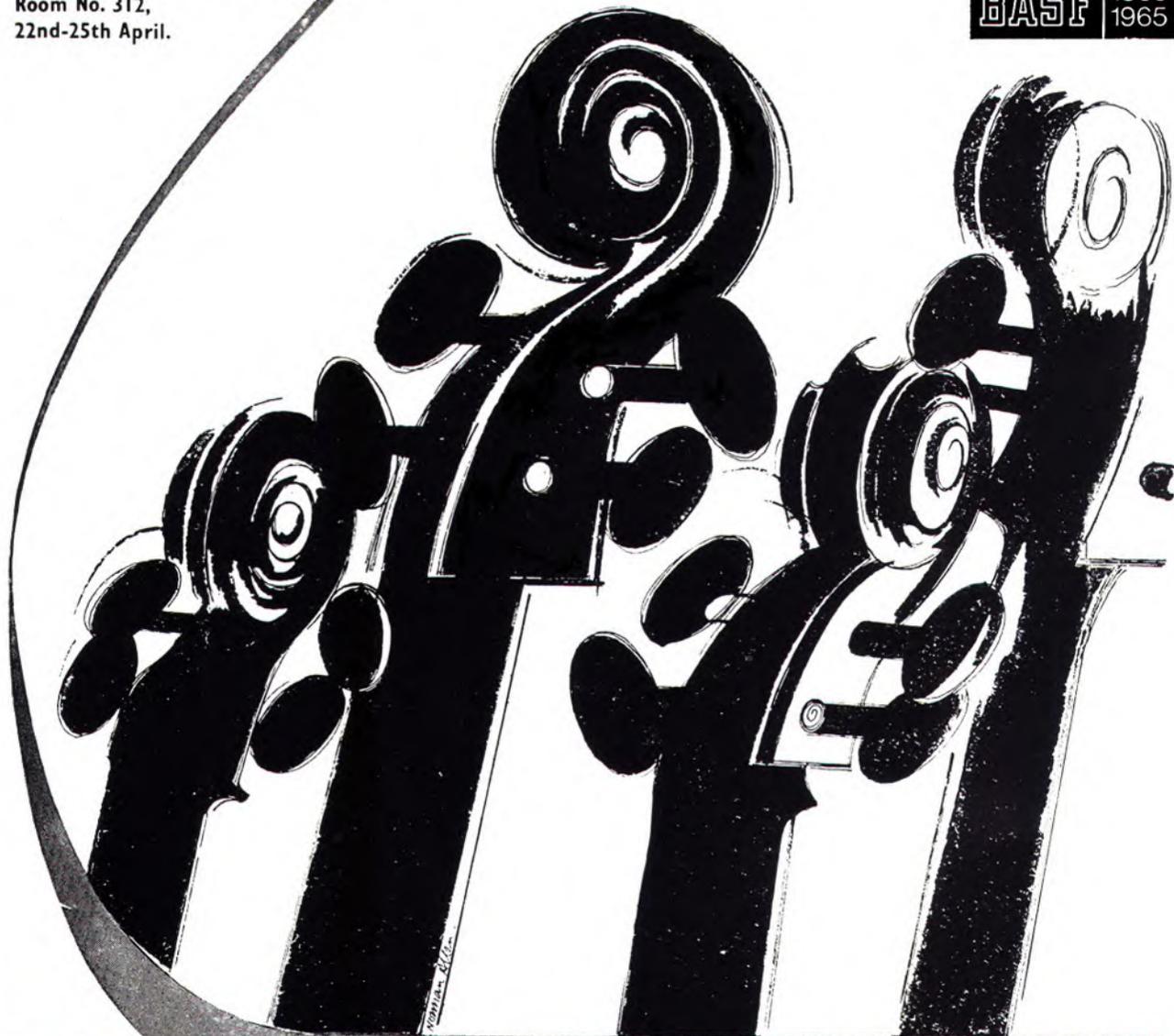


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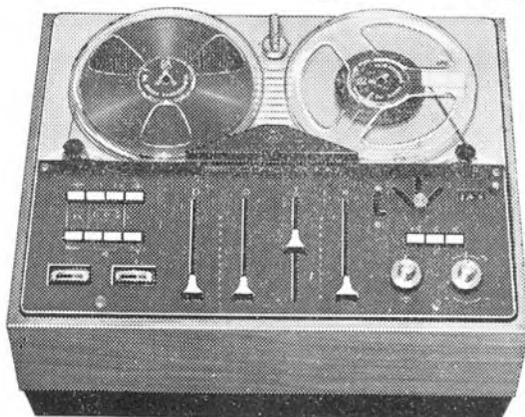
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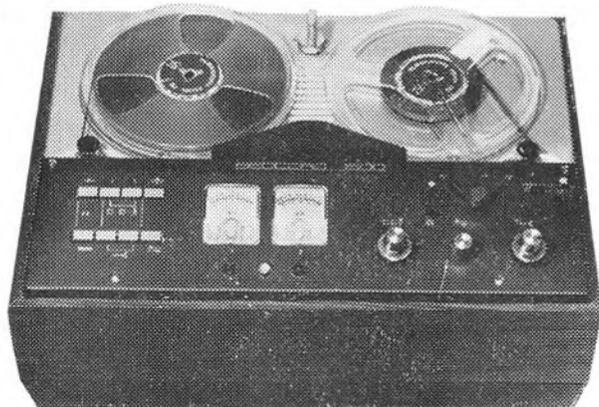
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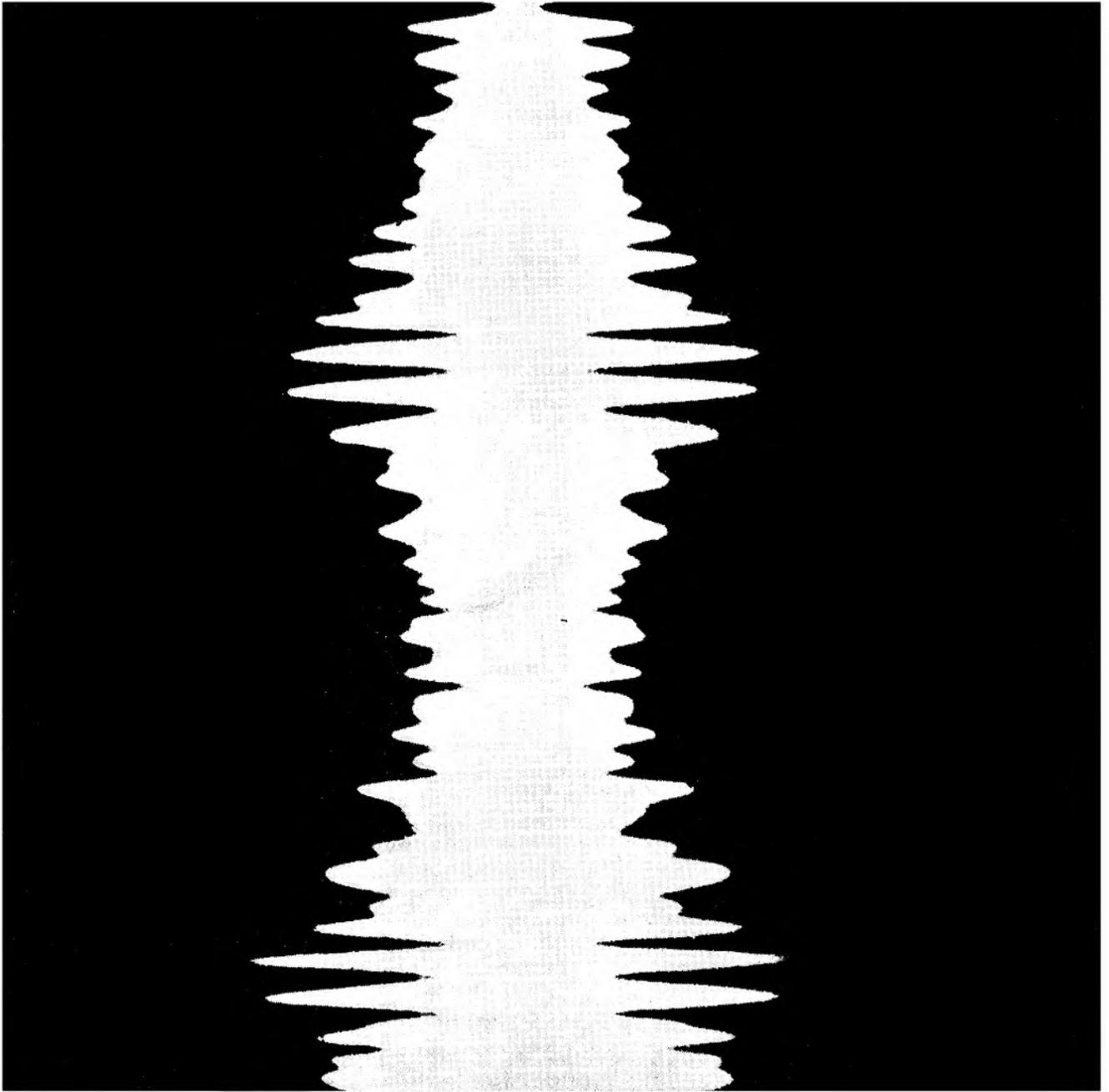
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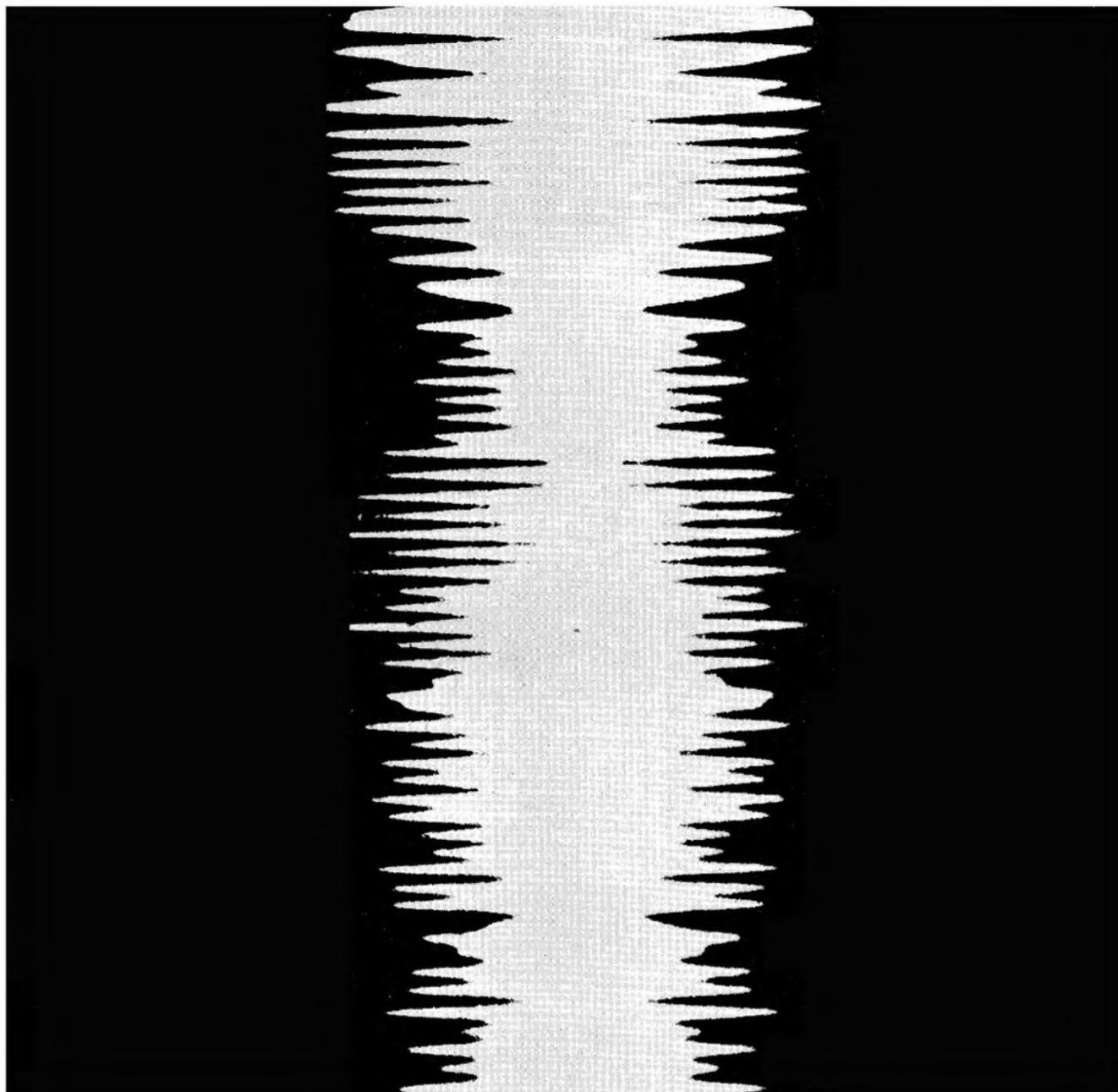
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Lord Jim



The Yellow Rolls-Royce

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STB2-STB2-STB2



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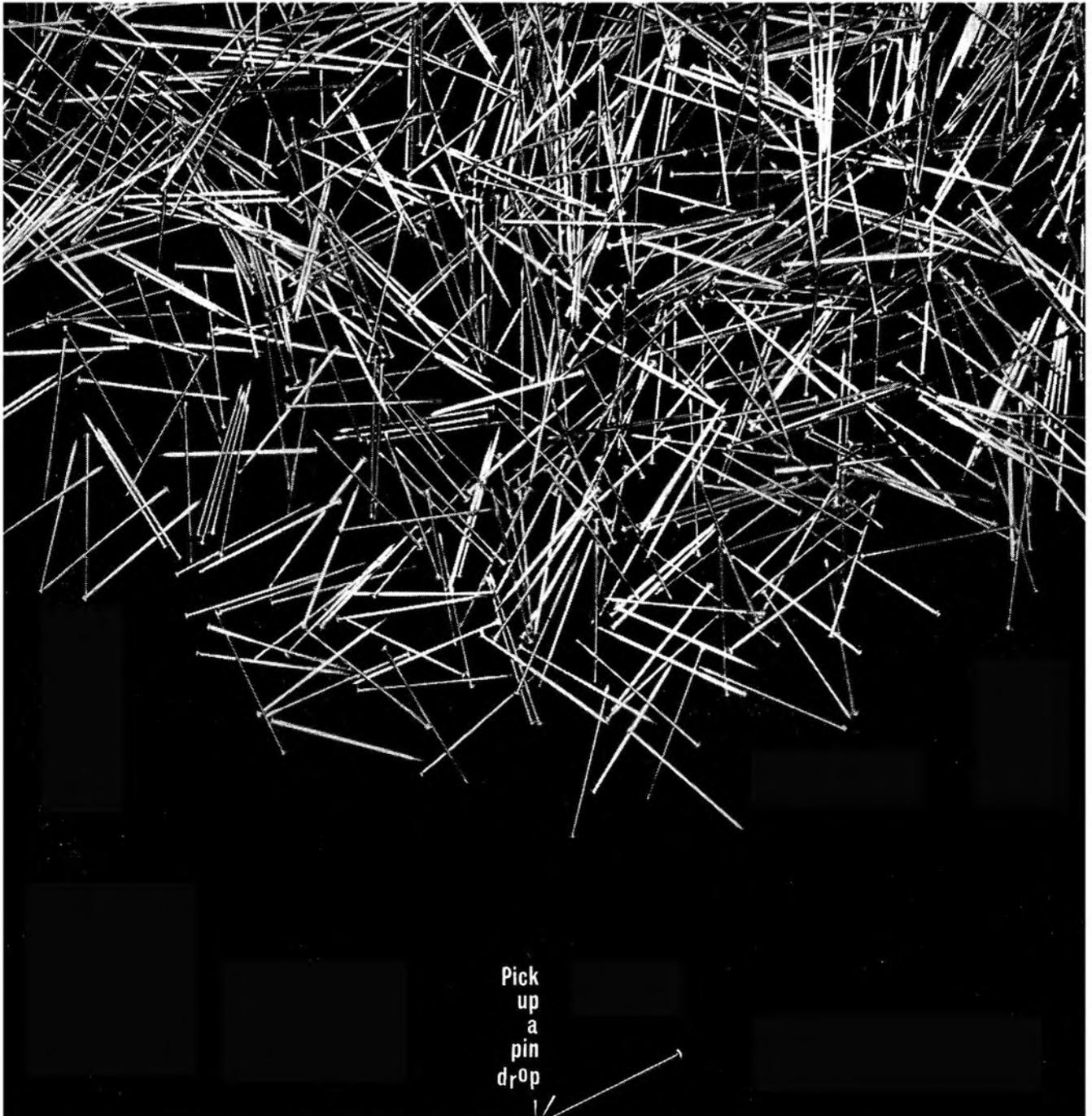
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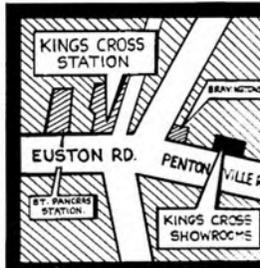
"Seen the Audio Fair? . . . Yes . . . Seen the Tape Recorder Fair? . . . No . . . What! You missed the opportunity of seeing it whilst in London? . . . Didn't know it was on! . . . Good Lord, thought everyone did. Right near Russell Square about 100 yards from King's Cross Station, can't miss it. They've got the finest and largest selection of tape recorders on display in this country. Over 250 models ready for immediate demonstration and comparison. Expert Staff. Ideal demonstration conditions. The Lot!! Take my advice, make another journey just to see it. You can't afford to miss it if you are interested in buying a tape recorder. It's put on by Britain's largest tape recorder specialist company, who know tape recorders literally inside out." Take his advice. Call into our KING'S CROSS showrooms or any other of our branches that is most convenient to you. They're worth a visit as anyone who has been will tell you. If you can't call then send today for our FREE 24-PAGE COLOUR BROCHURE by completing the bottom right-hand corner coupon.



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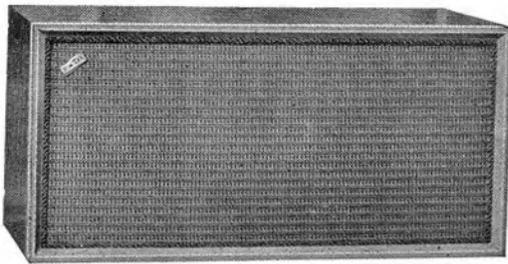
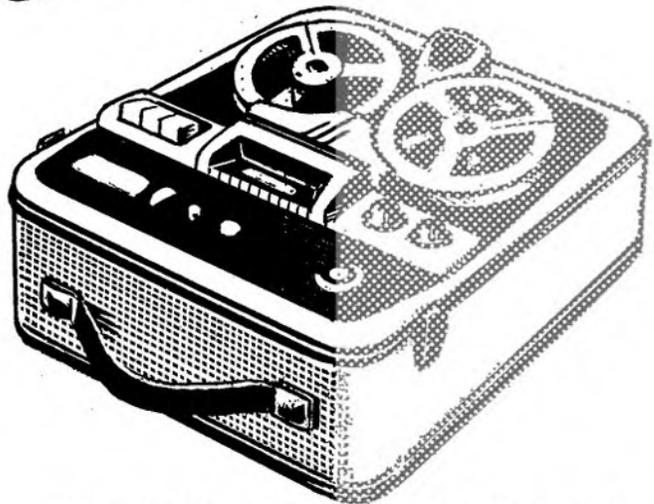
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R104 Four-Track Recorder

This recorder cost £45,000 (it's yours for 79 gns.)

PD104 Stereo Tape Unit



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R.102 Two-track76 gns.
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Stereo Tape Units

PD.102 Half-track.....93 gns.
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Monday



Tuesday



Wednesday



Thursday

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Friday



Saturday



Sunday

**AND
BRING
IT BACK
ALIVE**

NEW FI-CORD



202A

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Built to the same specification which made the Fi-Cord 202 the first choice of broadcasting and film companies, the new Fi-Cord 202A offers still more refinements. Among these are a button-operated battery tester with separate indicator scale, and a redesigned control panel, giving greater ease of operation, finished in silver-anodised aluminium.

Match the standards of the most exacting professionals with the new Fi-Cord 202A—the hand-made portable battery/mains recorder that captures every sound as faithfully as studio equipment.

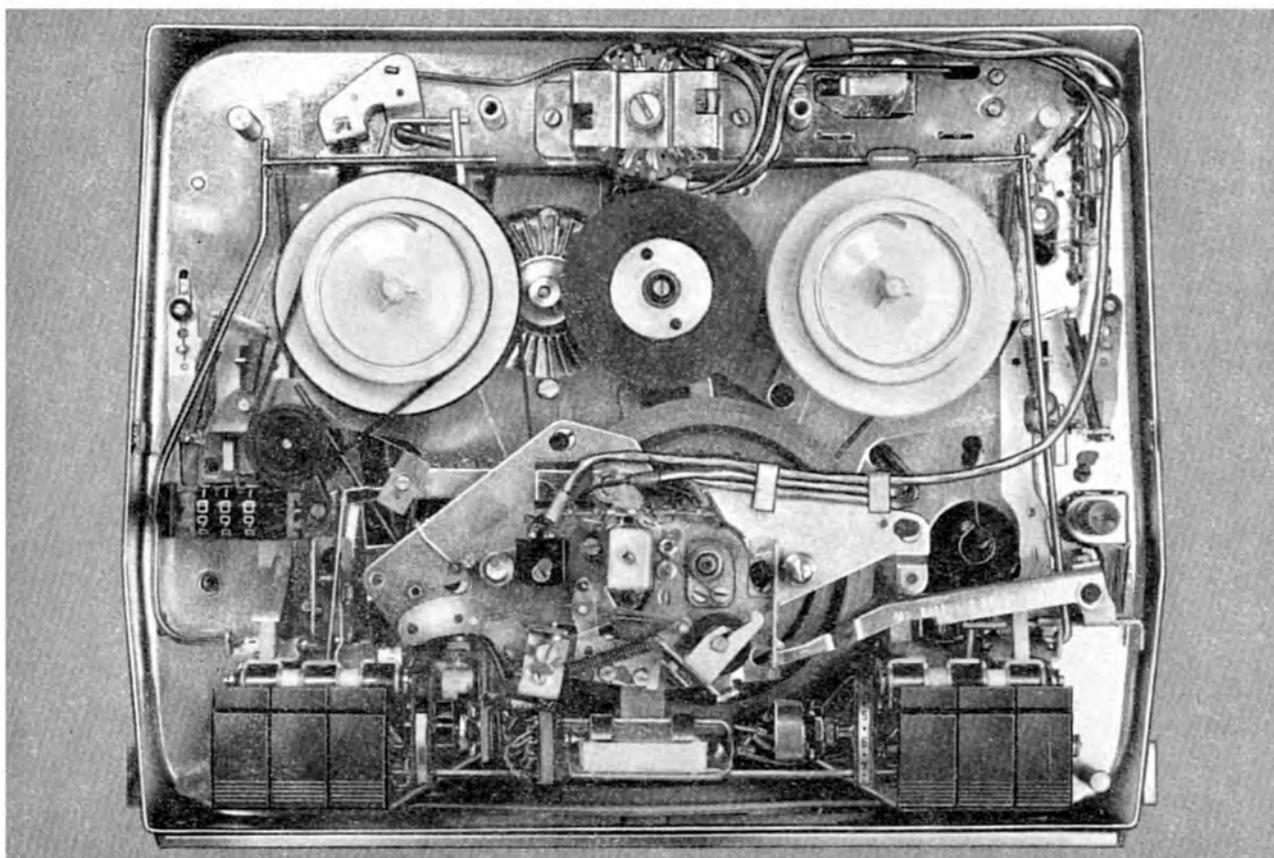
Brief specification

- * Frequency response: 50-12000 c.p.s. ± 3 db at $7\frac{1}{2}$ i.p.s.
- * Signal to noise ratio: 45 db unweighted at $7\frac{1}{2}$ i.p.s.
- * 2 speeds: $7\frac{1}{2}$ and $3\frac{3}{4}$ i.p.s.; standard 4" spools and $\frac{1}{4}$ " tape.
- * Vu-meter for recording level.
- * Input socket for any microphone with an impedance from 20-1000 ohms.
- * Constant motor speed with wow and flutter figure of less than 0.3 r.m.s. at $7\frac{1}{2}$ i.p.s.
- * Separate batteries operating motor and electronics to reduce motor noise to a minimum.
- * Button operated battery tester with indicator scale.
- * Fast forward and fast rewind.
- * Remote control socket for greater versatility.
- * Built-in speaker for monitoring.
- * Separate speaker and amplifier sockets.
- * Size: 9" x $6\frac{1}{2}$ " x $4\frac{1}{2}$ ".
- * Extras available include calfskin case, microphones, headphones, amplifier-speaker unit, transistorised mixer.

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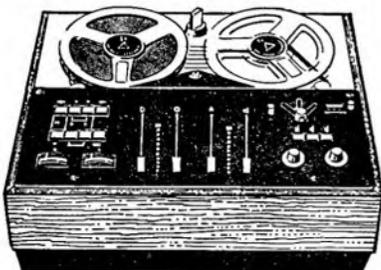
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TAPE

RECORDING
MAGAZINE

Vol. 9

No. 5

May 1965

IN THIS ISSUE

Tape trends and tape talk	182
<i>By the Editor</i>	
1965 International Audio Festival and Fair	183
<i>Special stand-by-stand survey</i>	
Tape and Cine	191
<i>Peter Ryde</i>	
Tape recording television	192
<i>John Valentine</i>	
Stereophile at Large	194
<i>John Cordeaux</i>	
Dramatape Miscellany	197
<i>By Perspective</i>	
Test Bench	198
<i>Revox 736</i>	
John Borwick asks	201
New Products	202
Tape records reviewed	204
<i>Edward Greenfield</i>	
Jazz on tape	204
<i>Mike J. Gale</i>	
Tape Bookshop	206
News from the clubs	207
Tape Exchanges	207
Advertisement Inquiries Service	213

COVER PHOTOGRAPH: One wonders what exactly were the thoughts of our nautical acquaintance as our photographer caught him studying the Audio Fair and British Tape Recording Contest posters recently in London. The chances of leave perhaps for the weekend of April 24/25, or the possibility of a substantial cash prize in the tape contest. He, and you, can obtain an entry form for the Contest by visiting us in Lounge 244 at the Hotel Russell during this month's Audio Fair. Incidentally, a broadside is due for those who didn't recognise the Fi-Cord 202 the matelot is carrying.

"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.

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

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EDITORIAL

FLEet Street 1455

ADVERTISING

LUDgate 9088

Editor,
R. DOUGLAS BROWN

Assistant Editor,
FRED CHANDLER

Tape trends and tape talk

By the Editor

MORE NEWS ABOUT VIDEO:

From "TAPE" offices—We have tried to make "the first amateur sound-and-picture tape," and, to date, we have not succeeded.

An impressive and talented team of amateurs was assembled recently with the Wesgrove video recorder and a professional closed-circuit TV camera and monitor which we had been recommended as a good match.

We had hoped to have a Wesgrove technician at hand, but he was ill on the day and our efforts failed to turn up a substitute.

So we "had a go." We successfully recorded from a BBC television transmission. But our ambition was to record an original programme, which the video recorder is capable of doing, according to the literature.

By the time you read these words, we hope to have tried again and to have succeeded. If so, or whenever, we assure you of detailed coverage at the earliest moment of what is possible in the way of creative tape recording with the video equipment now available.

From the Continent.—More facts about the Philips video machine which is now being manufactured in Austria and which can be bought in Germany as model VR3400 for 7,000 marks (about £630). And a report in the magazine *Musikhandel* that "In Eindhoven, Holland, they are already working on a smaller model which will presumably reduce the cost."

Meanwhile the model VR3400 is being sold, with a four weeks' delivery time, to industrial, commercial and public service users. It measures about 24 x 17 x 15 inches and weighs about 100 lb. A TV camera to use

with it is priced at 2,500 marks (about £225). A 1,800 ft. spool of one-inch video tape costs 300 marks (about £27) and gives 45 minutes recording, on a single track. Incidentally, it is manufactured, according to the report from the Continent, here in England. A replaceable sound-head costs 200 marks (about £18).

These prices, of course, put the equipment beyond the range of the average amateur, but the trend is clear and it is quite obvious that well-tested equipment for the home at a price that many people can afford is not far off.

* * *

THIS LOOKS LIKE BEING a vintage year for ceremonial "get-togethers" by tape and audio enthusiasts.

I look forward to meeting many familiar friends, and new ones, too, in the *TAPE Recording Magazine* lounge at the Audio Fair. Cyril Rex Hassan has worked his magic again, the manufacturers have been competing strenuously for every foot of space available at the Hotel Russell, and doubtless the place will be packed throughout the four days of the Festival.

This year it seems likely that the Radio Show will have a much greater appeal to the audio enthusiasts than has been the case in recent years. The new organisers are obviously out to create a new specialist appeal.

And, in October, there will undoubtedly be a good deal of publicity for tape recording as a hobby when the International Federation of Sound Hunters hold their annual congress in London and the judging takes place at Broadcasting House of the International Amateur Recording Contest.

The BBC are co-operating generously to play host to the visitors from nine or ten European countries. Judging will take place in one of their studios.

This year's British Tape Recording Contest will, I hope, be a fitting prelude to the international event. There have been many more preliminary inquiries for information and entry forms than in any previous year, particularly from schools, and I look for a record entry.

I am particularly anxious to see a good entry from tape recording clubs. The clubs often appeal to manufacturers for assistance and I know that there is, in the minds of some firms, rightly or wrongly, an impression that the clubs are not as effective as they might be in stimulating and mobilising public interest in tape as a hobby.

The way to disprove this, and to ensure future industry backing for the hobby, is to demonstrate club enthusiasm by entering a large number of tapes in the British Contest, not only club tapes, but entries by individual members of clubs.

There is not a great deal of time left now before the May 31 closing date. Go to it!

* * *

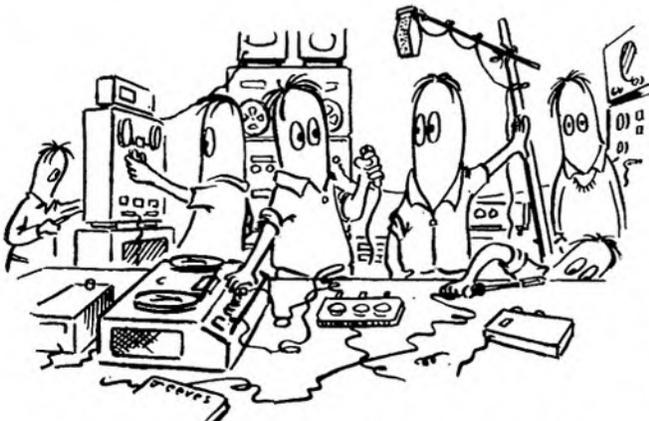
SOME OF THE BIG TAPE firms have, I hear, been acting vigorously against dealers offering cut-price tape.

I know of two specific cases. In one, tape which had been manufactured by firm A was being offered by a dealer under the brand-name of firm B.

In the other, tape made by firm C was correctly attributed to them, but it was of a type which they had long since ceased to manufacture. A check showed that it had been sold to a foreign broadcasting concern nine years ago.

Keen shoppers SOMETIMES find bargains; but you need to keep your eyes wide open these days.

LAUGH WITH JEEVES



"Well that's everything set up, now what shall we record?"

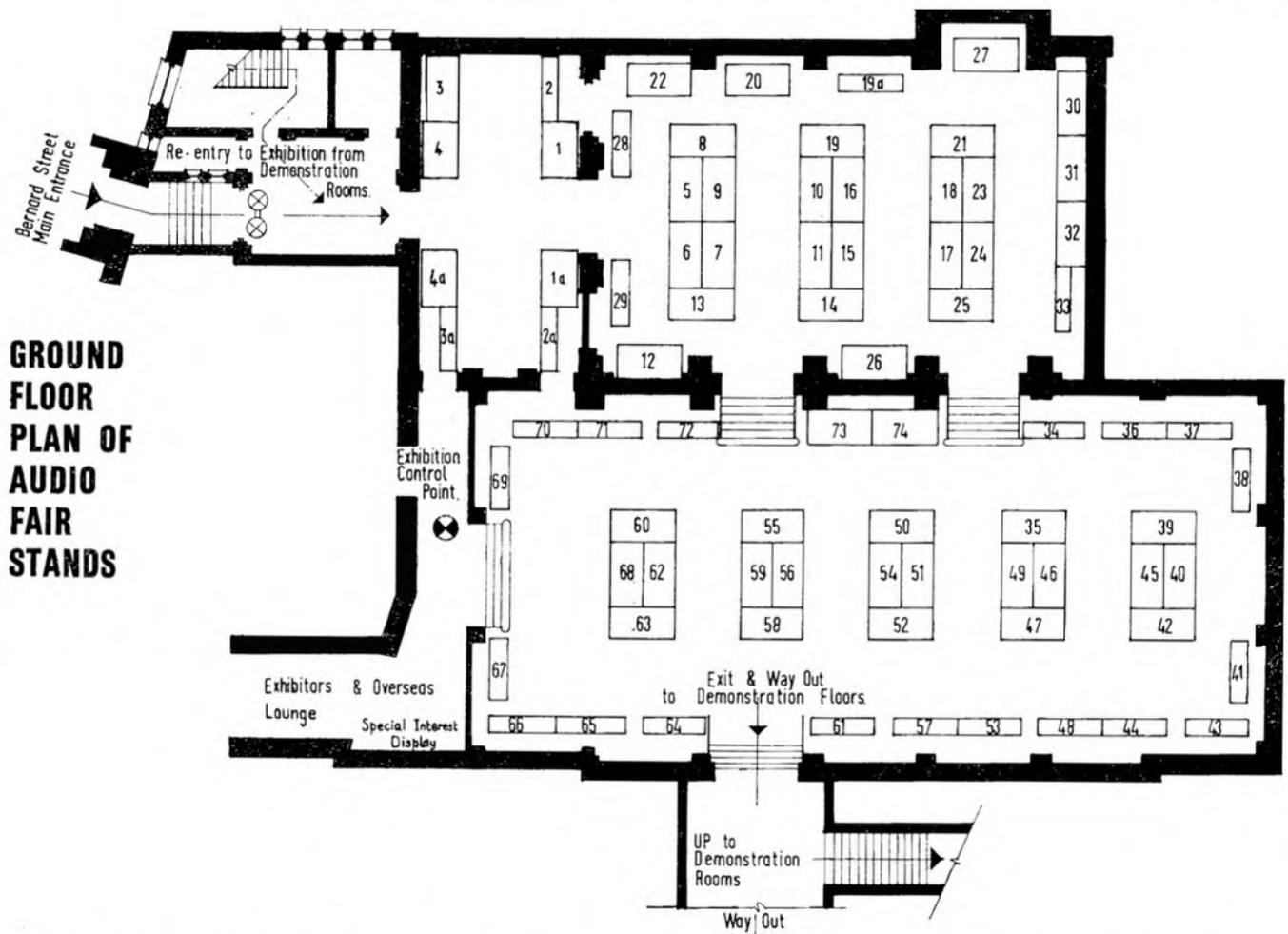
INTERNATIONAL AUDIO FESTIVAL AND FAIR 1965

The International Audio Festival and Fair is upon us once again, and enthusiasts from many parts of the U.K. and overseas, will be converging on the Hotel Russell, Russell Square, London, W.C.1. This year the Fair is held from April 22-25.

Admission is free, but only by ticket available from the Festival Director, 42 Manchester Street, London, W.1, or from the offices of "Tape." Dealers only are admitted up to 4 p.m. on the first day, thereafter the Fair is open from 4-9 p.m. on April 22, 11 a.m. to 9 p.m. on April 23 and 24, and 11 a.m. to 8 p.m. on April 25.

A wide variety of equipment is promised for display and demonstration at this unique audio exhibition. We shall be welcoming readers and other friends to our lounge, and our team of contributors, reviewers and critics, will be in attendance at various times throughout the show to answer your queries and problems.

In the following six pages, we provide a detailed preview of the stands, showing what to look for and where it is to be found. In our next issue we shall be reporting on any last-minute additions to displays.



AGFA (Stand 33, Demonstration Room 404, Office 439).

Agfa Limited, 27, Regent Street, London, S.W.1.

A demonstration of the durability of Agfa tape will be the main feature of the Agfa stand. A continuous loop of tape passing from a recorder through varying degrees of temperatures and conditions back to a replay unit will be used for this purpose.

Their range of tapes in varying sizes will be shown, together with the Novodur library storage cassette available as an alternative to the usual swivel type carton.

AKAI (Stand 25, Demonstration Room 214).

Pullin Photographic Limited (Rank Organisation), 11, Aintree Road, Perivale, Greenford, Middlesex.

Five Akai models will be shown by Pullin, four of which will be available for the first time. Certain to attract great interest will be the Akai X-1V battery and mains operated stereo recorder described in our March issue. With four speeds, 7½, 3½, 1½, 15/16ths ips, it weighs only 12½ lb., and features the unique Akai crossfield head designed to extend the frequency response. The price is 131 guineas.

The M8, natural successor to the earlier M6 and M7 recorders, will also be shown for the first time. This four-speed machine with a sound-to-sound recording arrangement provides facilities for multiple recordings from a single source or the study of foreign languages. It costs 151 guineas.

Also featured will be the Akai 345 three-speed professional machine with accommodation for 10½-inch spools, and the Akai SS-110 stereo speaker system designed to clip together for carrying. Ten-inch woofers and 3½-inch tweeters are incorporated.

Newest of their recent introductions is the Model ST-1, two-speed tape recorder.

STAND-BY-STAND SURVEY

Details of this machine are not available as we go to press on this issue.

Akai accessories will include microphones, tape and head cleaning kits, a bulk tape eraser, and tape splicer.



A.K.G. (Stand 51, Demonstration Room 304, Office 305).

Politechna (London) Limited, Eardley House, 182/4, Campden Hill Road, Kensington, London, W.8.

Seven recent additions to their extensive range of dynamic and condenser microphones will be seen on the A.K.G. stand. They are illustrated below.

First will be the D119CS, an extension to the present D19C range of microphones. Among the features of this £20 10s. unit are bass cut switch, on-off switch, and a windshield—a sock of soft material which attenuates popping and wind noise.

This single impedance (200 ohms) model has a triple impedance version, the D119ES, selling at £24 10s. Terminating in a five-pole Cannon socket, it provides a choice of 60 ohms, 200 ohms, or High impedance.

Also shown will be the D14S with high and low impedance switching in addition to an on-off switch. This cardioid unit, supplied with a five metre long cable, sells at £10.

Replacing the popular D77 will be the D66 stereo unit selling at £11 10s. Then there is the outdoor unit, D501, with a built-in windshield and a six-foot cable. At £12 10s., it has cardioid characteristics, and is designed for 200 ohms impedance.

Two other units making their debut are the DX11 reverberation microphone, and a

smaller version of the professional condenser unit, the C12. A reduction in the power unit which incorporates the pattern switch, the C12A provides a choice of nine different directional patterns. The price is £139.



AMPEX (Stand 15, Demonstration Room 121, Office 124).

AUDIO RECORD REVIEW (Office 444).



ARMSTRONG (Stand 52, Demonstration Room 347, Office 363).

Armstrong Audio Limited, Warlters Road, London, N.7.

Two new models will be added to the Armstrong range of amplifying equipment. First of these is the 221 integrated stereo amplifier selling at £33 15s. Based on the less expensive 222 amplifier, it has additional facilities including inputs for magnetic pick-up, treble filter, tape monitoring, and a switched "loudness" circuit. Introduced with it will be their Stereo Multiplex Decoder at £14 10s. This is designed for use with any of their current stereo tuners and amplifiers. It incorporates a pilot indicator light which, when fitted into the tuner socket will indicate when stereo transmissions are being broadcast.



B.A.S.F. (Stand 28, Demonstration Room 312).

BEYER (Stand 10, Demonstration Room 413). See "Fi-Cord," page 186.



B.M.B. (Stand 48).
B.M.B. (Sales) Limited, Crawley, Sussex.

Exhibiting for the first time at the Russell Hotel. B.M.B. will be showing their range of sapphire and diamond styli.



BRAUN (Stand 22, Demonstration Room 311, Office 309).

Argelane Limited, 251, Brompton Road, London, S.W.3.

The range of stereo tuners, amplifiers, speakers and record-players manufactured by the German Braun company will include three new items this year.



BRENELL (Stand 12, Demonstration Room 337, Office 340).

Brenell Engineering Co. Limited, 231-235, Liverpool Road, London, N.1.

Recent developments at Brenell's new factory in North London has led to the introduction of modified versions of established recorders. The Brenell Mark 5, Series 3 tape deck, basis for all their current models, will



The S. G. Brown "Diplomat" headset

be shown together with the STB2/5/2 stereo unit incorporating separate record and playback amplifiers. With replay facilities for two- and four-track stereo and mono recordings, this unit is designed for the hi-fi enthusiast requiring mono/stereo recording facilities for an established hi-fi installation.

Also to be seen will be the Mark 5 Type "M" Series 3 four-speed, mono, half-track recorder, and the Mark 519 Series 3 deck with accommodation for 10½-inch spools.



BROWN (Stand 73, Demonstration Room 320, Office 324).

S. G. Brown Limited, King George's Avenue, Watford, Hertfordshire.

Three new items will be shown at the Brown stand. First is the "Dual Function" microphone suitable for conventional pressure-operated configuration or differential operation rendering the microphone sensitive only to sound originating in close proximity to it. Suited to deal with the majority of programme situations, it is transformed by the simple operation of a shutter mechanism (see illustration page 185).

New also is the "Canada" headset which uses Circumaural earpieces with liquid-filled earpads, and the "Dynamic" headset.



BUTOBA (Stand 42, Demonstration Room 220, Office 226).

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

The new MT22 battery operated transistorised tape recorder will be shown for the first time by Butoba. With three tape speeds, 7½, 3½, 1½ ips. and incorporating three



motors, it will retail at 89 guineas. Among the features are remote control rewind and pause, 5¼-inch spools, 40-18,000 cps frequency response, and a seven-inch round loudspeaker. A range of microphones (£5-£20) will be available for use with this machine.

The established MT5 battery/mains recorder now selling at 59 guineas will also be shown.

This year Denham and Morley will also represent the Danish S.R.T. company, and will be showing their range of Danetone disc-playing equipment.



The S. G. Brown "Dual Function" microphone

CELESTION (Stand 46, Demonstration Room 242, Office 243).

Celestion Limited, Ferry Works, Thames Ditton, Surrey.

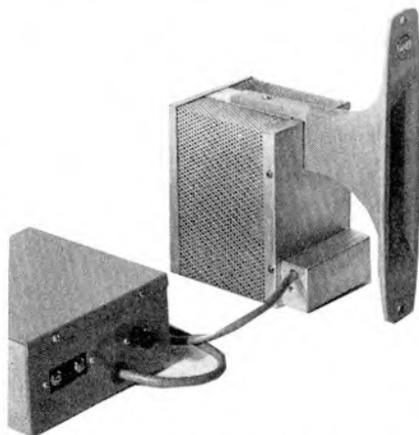
The "Ditton 10" hi-fi loudspeaker system will feature for the first time at the Fair. With a power handling capacity of ten watts, and a frequency response from 35-15,000 cps, it measures only 12¼ × 6¼ × 8¼ inches.

Also on display will be the successful twelve-inch co-axial loudspeaker models CX 1512 and CX 2012.



CHAPMAN (Stand 71, Demonstration Room 318, Office 316).

CLARKE & SMITH (Stand 35, Demonstration Room 120).



Fane Acoustics "Ionophone"

Ferrograph introduce new style —E.M.I.'s latest recorder

CONNOISSEUR (Stand 34, Demonstration Room 144, Office 162).

A. R. Sugden & Co. (Engineers) Limited, Market Street, Brighouse, Yorkshire.

The Connoisseur range of turntables, pick-ups and speakers, plus stereo and mono cartridges and the SAU1 pick-up arm will feature on stand 34. New this year is the Classic turntable, pick-up and plinth assembly.

Completing their range of products will be the Craftsman column speakers.



DECCA (Stand 31, Demonstration Room 236, Office 231).

Decca Radio & Television, 9, Albert Embankment, London, S.E.1.

A last-minute surprise by Decca who have announced their marketing plans for the loudspeakers designed by Stanley Kelly. A new Kelly Mini will be demonstrated in room 236, and a new larger enclosure plus a development in HF diffusion in room 233.



DECCA RECORDS (Stand 23, Demonstration Room 235, Office 231).



DESIGN FURNITURE (Stand 45, Demonstration Room 442, Office 443).

Design Furniture Limited, Calthorpe Manor, Banbury, Oxfordshire.

A new loudspeaker enclosure, Model C15/20, plus two equipment cabinets, Models EQC14 and EQC15, will be seen at the Design Furniture stand. Available in three alternative timbers with carefully selected veneers.



E.M.I. (Stand 24, Demonstration Room 348, Office 362).

E.M.I. Electronics Limited, Blyth Road, Hayes, Middlesex.

The first public showing of the new L4 portable professional tape recorder will be given on stand 24. The recorder, featured in *TAPE* last month, has an additional five features over the previous models including two speeds, remote control, mixing facilities and press-button operation.

Other tape recorders to be shown will include the TR52 and the BTR4—previously known as the Type 311.

Four grades of Emitape wound on spools from three inches to 8¼ inches, plus the series of six instructional Emiguide tape records, and John Borwick's "Guide to better recording" will also be shown.



FANE ACOUSTICS (Stand 38, Demonstration Room 314).

Fane Acoustics Limited, Hick Lane, Batley, Yorkshire.

The latest version of a new type of loudspeaker, the Ionophone, will be seen for the first time at the Russell Hotel. Fane have

recently acquired a licence to manufacture this "loudspeaker without moving parts" and will be showing three versions during the show.

The Ionofane Model 601, retailing at 28 guineas, comprises the basic high frequency unit. The makers claim a uniform response from 3,000 cps to 30,000 cps, and recommend a cross-over of 3,500 cps. It will handle the high frequency portion of twenty watts of music.

The basic high frequency Ionofane unit, combined with a new five-inch high flux mid-range unit and a 12 dB per octave cross-over network is offered as the Ionofane Model 602 at 45 guineas. This is intended for use with a good bass enclosure, and terminals are provided for easy connection.

The Ionofane Model 603 is a complete full range loudspeaker system. A powerful fifteen-inch bass unit is added to the Model 602, and housed in a Design Furniture cabinet. The price is 75 guineas.



FERROGRAPH (Stand 61, Demonstration Room 147, Office 148).

The Ferrograph Company Limited, 84, Blackfriars Road, London, S.E.1.

A slight departure from normal design and appearance on the Ferrograph stand, where the new Series 6 mono and stereo tape recorders will be seen for the first time.

Housed in cabinets rather different from the normally accepted "clinical" Ferrograph presentation, the new units represent a concession to modern cabinet design without too great a departure from the established conservative appearance associated



The new Ferrograph Series 6 Recorder

with the name. The Series 6 machines also have the additional feature of three operational speeds and a new design of synchronous capstan motor with ball-race bearings.

Prices of the five new units are as follows. With tape speeds of 7½, 3¼, and 1½ ips, are the 631 (88 guineas), 632 (115 guineas), and 634 (120 guineas). The 631/H (92 guineas) and 632/H (120 guineas) incorporate a tape speed of 15 ips, instead of 1½ ips.

New battery recorder from Fi-Cord —Grampian transistor amplifier

FI-CORD (Stand 11, Demonstration Room 412, Office 426).

Fi-Cord International, 40a, Dover Street, London, W.1.

Fi-Cord will be introducing the new 202A battery/mains tape recorder which replaces the three-year-old 202 model. Compared with its predecessor, the 202A has a new battery testing system, a re-designed control panel, new VU-meter recording level indicator, and a new colour scheme.

Normally powered by mercury batteries, the 202A is a versatile machine which can be operated from a 12-volt DC car battery, 105-240 volts AC mains, or re-chargeable accumulators.

The first two Fi-Cord manufactured microphones will also be shown on this stand. These are the 801 and 901 dynamic moving coil units. The range of Beyer microphones, handled in this country by Fi-Cord, will include two new models. First there is the M80 cardioid instrument with a quoted frequency response of 50-16,000 cps, and the M110, dynamic directional microphone with a claimed response of 60-12,000 cps.

The Universal Synchrodeck for linking tape recorder and cine projector, and the Synchroslide for use with slide projectors will complete their display.



GARRARD (Stand 67, Demonstration Room 213, Office 216).

Garrard Engineering Limited, Newcastle Street, Swindon, Wiltshire.

Garrard, now functioning within the Plessey Group, having discontinued their tape deck making will be concentrating on their range of transcription turntables and auto-changers.

Principal feature of interest for tape enthusiasts will be the pick-up cueing device which can be used to lower or raise the arm slowly at any point on the disc.



GOLDRING (Stand 41, Demonstration Room 334, Office 333).



GOODMANS (Stand 68, Demonstration Room 249, Office 250).

Goodmans Industries Limited, Axiom Works, Lancelot Road, Wembley, Middlesex.

The tiny shoe-box size "Maxim" will be making its second appearance following its introduction at last year's show. Stereo demonstrations will be given to illustrate the possibilities for even the smallest living room at a reasonable cost.

The Goodmans selection of hi-fi loudspeakers from the Axiette eight-inch unit to the massive eighteen-inch diameter giant speaker, the Audiom 91, will also be shown and demonstrated.



THE GRAMOPHONE (Demonstration Room 446).

G.K.D. (Stand 26, Demonstration Room 115, Office 116).

GKD Limited, 74 Langley Street, Luton, Bedfordshire.

Redesigned versions of the Huntingdon and Anglian cabinets will be shown by G.K.D., whose units will now accommodate most equipment. Ease of installation of equipment, correct ventilation, and fitted locks now make these two units more versatile.

Also shown will be the Chiltern cabinet for Leak equipment with additional provision for turntable and tape, in a choice of



Fi-Cord's FC122 general purpose microphone

walnut or teak finished at 39 guineas; the Southdown, smaller version of the Chiltern without a tape section, at 29 guineas; and the Duette at 45 guineas. Suitable for placing in almost any recess, or used as a room divider, the Duette features eye-level finger-tip controls, pick-up away from hum field, and facilities for accommodating any integrated amplifier, tuner, tape or motor.



GRAMPIAN (Stand 54, Demonstration Room 302, Office 301).

Grampian Reproducers Limited, The Hanworth Trading Estate, Feltham, Middlesex.

New items to be seen on the Grampian stand will include a five-watt transistorised portable amplifier, a mains transistor model, and a fifty-watt heavy duty amplifier. In addition to these there will be a new double-cone high quality 12-inch loudspeaker.

The small transistor amplifier is designed for use on location. It will fit comfortably into the glove shelf of a car, and can be connected to the twelve-volt battery.

A master microphone control features on the fifty-watt heavy duty amplifier, in addition to the four independent controls. All microphones can be faded by this one control. Also featured are separate bass and treble controls as well as an independently controlled auxiliary input.

The new loudspeaker is the TC12, suited for music and speech reproduction.

Their range of moving coil microphones will include the famous DP4, newly entitled the Prize Winner following its success in last year's British Amateur Tape Recording Contest. Ribbon units will also be displayed,

and Grampian introduce some new cardioid models this year.

In room 302, the self-contained battery-operated Reverberation Unit, used by recording and broadcasting organisations, will be demonstrated.



HAMMOND (Stand 14, Demonstration Room 112).

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

A custom-built high fidelity sound system, the Hammond Consort, will be among the items shown for the first time at the Audio Fair. Installed in a Rosewood cabinet with satin chrome fittings and black leather doors, it contains an AM/FM tuner with Multiplex circuit, an integrated 12 watts per channel stereo amplifier, and a Garrard A 70 transcription turntable with magnetic cartridge. Separate tone controls, facilities for tape or direct monitoring also feature, together with two multi-speaker systems for attachment to each side of the cabinet or freestanding.

Also making their debut will be the Hammond Europa loudspeaker system employing two tweeters, one mid-range, and one bass drive unit, and the Hammond L7 with a twin-cone wide range speaker. Respective size and prices are 33½ x 16 x 11½ inches, 29 guineas, and 20 x 13 x 4½ inches, £11 0s. 6d.

Fourth new item is the Hammond Condenser microphone, an entirely re-designed version of the original "Mikrokit." Supplied fully assembled at 28 guineas, it has a low impedance output, and regulated transistorised power supply.



HAYMARKET PRESS (Stand 50).



ILFORD (Stand 62, Demonstration Room 113).

Ilford Limited, Ilford, Essex.

The wide range of Zonatape magnetic recording tape will appear for the first time on the stand of Ilford, making their first appearance at the Hotel Russell. This will include standard, long, double, and triple-play varieties on spool sizes from three to 10½ inches in diameter.

Also shown will be their accessories including coloured leader and timing tape, splicing tape, and metallic stop foil.



ILIFFE ELECTRICAL PUBLICATIONS (Stand 1).



JORDAN-WATTS (Stand 55, Demonstration Room 117).

Boosey & Hawkes (Sales) Limited, Sonorous Works, Deansbrook Road, Edgware, Middlesex.

The skill and detail that goes into the manufacture of the Jordan-Watts modules will be shown in the "exploded" parts display, central feature of stand 55.

Among the loudspeaker systems to be seen will be the DPS100, a development in the reproduction of stereophonic sound which provides a more precise stereo image and maintains this throughout the room. Its effectiveness can be judged under Audio Fair conditions where the presentation of a satisfactory stereo picture to an entire audience is normally impossible.

K.E.F. (Stand 36, Demonstration Room 322, Office 323).

K.E.F. Electronics Limited, Tovil, Maidstone, Kent.

A comparison between first grade professional and domestic equipment will be given in Room 322 where K.E.F. will be exhibiting their recently announced versions of BBC monitor speakers. Described as manufactured to a standard of accuracy normally associated with amplifiers than loudspeakers, they are adjusted for balance within one dB of the standard, and possess quite exceptional directional characteristics.

K.E.F. have designed a special speaker system in a 0.8 cu. ft. cabinet, for use in the joint venture with the firms of Armstrong, Goldring, and Record Housing to assemble hi-fi equipment for sale as a package deal. This "Group 4" venture speaker will also be demonstrated.

In the same room, K.E.F. will be representing Audio Dynamics Corporation, manufacturers of pick-up cartridges.



KELLY (Stand 32, Demonstration Room 233, Office 232). See "Decca," page 185.



KODAK (Stand 59, Demonstration Room 248, Office 251).

Kodak Limited, Kodak House, Kingsway, London, W.C.2.

A combination of professional master tapes and explanatory colour slides used in conjunction with a range of tape recorders, including inexpensive battery and mains recorders, will be used to demonstrate Kodak's range of magnetic recording tape.

Focus of much interest will be their unique quadruple-play tape, which has revolutionised the playing time and quality obtainable from battery portable recorders.

Their five varieties of tapes each designed for specific recording purposes, will include the P200. This contradictory sounding "specific 'General Purpose'" tape is of the double-play variety, and is described as providing excellent results on any recorder at any speed.



LEAK (Stand 69, Demonstration Room 448).



LEOWE-OPTA (Stand 40, Demonstration Room 118).

Hightate Acoustics, 71-73 Great Portland Street, London, W.1.

Three battery- and mains-operated tape recorders, including one machine making its debut will be shown at the Leowe-Opta stand. These are the Optacord 408, introduced last December, the Optacord 414, and the Optacord 416 (described in "New Products" on page 202 of this issue).

In addition will be the German company's range of radios, radiograms, and integrated tuner/amplifier.



LINK HOUSE PUBLICATIONS (Stand 39).



LONG PLAYING RECORD LIBRARY (Demonstration Room 155).

The Long Playing Record Library Limited, Squires Gate Station Approach, Blackpool, Lancashire.

The LPRL will be showing their well-

KEF join four-firm venture for hi-fi package deal

known guides to the available recording repertoire on disc. A new edition of their "Classical Catalogue and Handbook" at 6s. will be available, and the "Guide to Bargain Classics, Vol. 3(1)" will be published concurrently with the Fair.



LOWTHER (Stand 29, Demonstration Room 234, Office 205).



LUSTRAPHONE (Stand 16, Demonstration Room 342).

Lustraphone Limited, St. George's Works, Regents Park Road, London, N.W.1.

The Lustraphone range of all British equipment will again represent the wide use of audio equipment in educational services, public address, broadcasting, recording studios, tape recorder users, and social services.

Microphones, transistor equipment, "radiomic" systems, stands, booms, and accessories will be featured.

Their microphone range will offer a unique selection for every tape recorder user, and an entirely new Radio microphone cum transmitter conforming to GPO specification will be introduced for the first time, together with valve/mains single and multi-channel receivers.

In addition, many useful accessories will be shown. These include the flexible "Stayput" positioning tubes of varying lengths, and cable exit bushes and plug and socket releases enabling roving or hand microphones to be lifted from stands and replaced without interfering with cable connections.



MALLORY (Stand 43).

Mallory Batteries Limited, Crawley, Sussex.

Focal point on the Mallory stand is the introduction of a new, improved version of their 1½-volt Manganese Alkaline dry-cell system. This has been developed to give a lower internal impedance and better stability at high current drains.

Main theme of the stand is the ability for their batteries to deliver a constant voltage output throughout their exceptionally long life. Full ranges of the Mallory batteries of particular value in quality audio equipment will be displayed.



MASTERTAPE (Stand 9).



METROSOUND (Stand 1A, Demonstration Room 114).

Metrosound (Sales) Limited, Bridge Works, Wallace Road, London, N.1.

Of interest to tape enthusiasts will be the Swedish manufactured speakers Model B-7 and Mini-B. Both of these units housed in enclosures measuring 16½ x 11½ x 3½ and 10 x 5½ x 7 inches respectively emanate from Sweden's largest and oldest established speaker manufacturer. With impedances for 15/16 ohms, they can be adapted at no extra cost with a ¾ ohm impedance.

Also exhibited will be the Swiss Thorens turntables, the Technical Ceramics "Sono-

tone" stereo cartridge, and the Ortofon cartridges, at stands 4A, 2A and 3A.



MULLARD (Stand 19, Demonstration Room 211, Office 209).

Mullard Limited, Mullard House, Torrington Place, London, W.C.1.

Do-it-yourself enthusiasts will be especially interested in several new transistor circuits being shown on the Mullard stand. Among these are designs for a tape recorder, decoder, and ten-watt amplifier.

A new "harmonious range" of transistors will also be shown offering a simple and economical approach to audio circuit design. The range consists of complementary n-p-n/p-n-p types for use in transformerless push-pull output stages with output powers from 40mW to 40 watts.



PETO-SCOTT (Demonstration Room 152).



PHILIPS (Stand 8, Demonstration Room 149, Offices 150/151).

Philips Electrical Limited, Century House, Shaftesbury Avenue, London, W.C.2.

The battery-operated cassette-loaded EL 3300 tape recorder appearing for the first time at the Hotel Russell, will attract great attention among the Philips range of recorders.

Although not promising any brand new recorders this year, their recently introduced EL 3552 low-priced single-speed machine selling at 24 guineas should attract attention also.

The remainder of the Philips range covering each of the price brackets include the battery operated EL 3586, two-speed "Family" recorder EL 3548, and the four-speed EL 3549 with its stereo version EL 3534. Also on show will be their range of accessories, microphones, and tapes.



PLANET (Stand 30, Demonstration Room 313, Office 325).

Planet Projects Limited, Goodman Works, Belvue Road, Northolt, Middlesex.

The Planet display this year will be concentrated on their new CD2 continuous tape transport mechanism. Unique in its field, this unit offers over 8½ hours of uninterrupted music using double-play tape at 1½ ips. The international four-track recording sense is employed to enable standard equipment to be used for recording tapes. A second version with a ¾ ips speed is available.



RADFORD (Stand 5, Demonstration Room 122, Office 123).

Radford Electronics Limited, Ashton Vale Estate, Bristol 3, Gloucestershire.

Two new loudspeakers will be among the items shown by Radford. First is the "Series 3" Super Bookshelf Loudspeaker, 21 x 12 x 8 inches, and the XLS medium unit measuring 26 x 15 x 11½ inches.

Two drive units integrated by a ten element electrical network feature in the

Scotch to show instant selection Sound Effects machine

"Series 3," and the XLS uses three drive units integrated by an 18-element network. Respective frequency responses are 60-14,000 and 40-14,000 cps.

Also new is the SC22 control unit, designed to work from low output pick-up. An FM tuner, plus additional tuners will also be shown.



RECORDS AND RECORDING (Stand 74).



RECORD HOUSING (Stand 21, Demonstration Room 447, Office 463).

N. & S. B. Field & Co. Limited, Brook Road, London, N.22.

Models from their range of twenty cabinets to be shown on the Record Housing stand will include the Longfellow measuring over six feet from end to end, capable of housing a comprehensive hi-fi set-up including turntable, tape recorder, amplifier and tuner, tapes and discs. The price is 39 guineas. A similar cabinet, the Schubert, does precisely the same job but it is an upright unit only 42 inches long. It costs 35 guineas.

Centrepiece of their exhibit will be the entirely new Hi-Flex Audio System featuring an equipment-housing unit, record-housing unit, and a twelve-inch loudspeaker enclosure. Flexibility being the keynote, these units can be used as free-standing cabinets or in continuous runs along or up the wall. Incorporating the increasingly popular shelf-mounting system, will be the standard Nordyk Range using Hi-Raks.



RESLOSOUND (Stand 70).

Reslosound Limited, 24 Upper Brook Street, Mayfair, London, W.1.

A new switched version of the Reslo Dynamic microphone will be introduced at the Audio Fair. Suitable for use with high quality and semi-professional tape recorders, and PA use, the new version follows last year's successful introduction of its predecessor.

Second new model will be the professional ribbon microphone (Type SR1), designed for broadcasting and studio work.

The wide range of ribbon and dynamic microphones, plus accessories including table and floor stands, adaptors, transistorised couplers will also feature.



REVOX (Stand 72, Demonstration Room 422, Office 423).

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

New on the Revox stand this year will be their "Slide-o-Matic" transistorised accessory for use with an automatic transparency projector. A pulse recorded on one channel of the Revox recorder controls the slide change motor of the projector, and a remote stop/start tape deck control is incorporated. The price is 17 guineas.

The Swiss manufactured Revox 736, which first appeared at last year's show, and which is reviewed on page 198 of this issue, will again be shown and demonstrated.

ROGERS (Stand 44, Demonstration Room 419, Office 418).

Rogers Developments (Electronics) Limited, 4-14 Barmeston Road, Catford, London, S.E.6.

New versions of established designs of Rogers equipment will be shown at the Russell. First of these is the HG88 Mk. III integrated stereo amplifier. This latest version features increased power output, more comprehensive input and control facilities, and has been re-styled to match the new Cadet III range. Features of particular interest include tape monitoring facility, tape panel socket, high performance filters, plug-in pick-up matching adaptors, and silicon rectifiers in the power supply. It is available in either chassis or case form.

Also re-styled to match the Cadet III range is the Variable FM receiver Mk. III. Preliminary information suggests the demonstration of prototypes of an entirely new high performance speaker system. Other demonstrations will feature the above two new units with a Lowline equipment cabinet and a Goldring "88" Transcription motor and Decca Mk. III professional pick-up; and the recently introduced Cadet III stereo amplifier/control unit system.



QUAD (Stand 65, Demonstration Room 404, Office 439).

Acoustical Manufacturing Co. Limited, Huntingdon, Hertfordshire.

The unique Quad electrostatic loudspeaker considered by many enthusiasts to be the ultimate in loudspeaker design will again be shown and demonstrated at the Audio Fair.

Also shown will be Quad control units, tuners and amplifiers and their latest multiplex decoder for stereo broadcasts. At present for export only, it will be released in the U.K. when the BBC decide to introduce a regular series of stereo broadcasts.



SABA (Stand 47, Demonstration Room 212, Office 224).

Saba Electronics Limited, 3 and 5 Eden Grove, London, N.7.

Two fully transistorised stereo tuner/amplifiers, the Stereo Studio T11, and Stereo Studio T111 with respective outputs of 24 and 70 watts will be introduced by Saba.

Also shown will be the Saba TK230S two-speed, four-track, stereo tape recorder together with an impressive list of accessories designed for use with this machine.

Emphasis is likely to centre on the fully automatic facilities provided on their range of de-luxe equipment, and even if the prices don't suit every pocket, the experience is well worth a visit.



SCANDINAVIAN RADIO & TV (Stand 13). See "Butoba," page 184.



SCOTCH (Stand 58, Demonstration Room 420, Office 421).

Minnesota, Mining, and Manufacturing Co. Limited, 3M House, Wigmore Street, London, W.1.

In addition to their range of Scotch Brand magnetic recording tapes, the 3M company

will be introducing two developments in the use of tape. First will be 3M's own stereo tape cartridge system now in the proving stage. This automatic self-changing tape unit records and plays back both stereo and mono cartridges. Up to twenty cartridges may be stacked on the loading platform at one time, providing up to fifteen hours' playing time utilising the fully automatic play, rewind, cartridge change mechanism.

Also new is the Mellotron Sound Effects machine. In the past year, Mellotronics Ltd. have incorporated 1,260 BBC sound effects, any one of which can be selected and played in a matter of seconds.



SCOTT (Stand 17).

A. C. Farnell Limited, Hereford House, North Court, Vicar Lane, Leeds 2, Yorkshire.

As sole distributor in the UK, Farnell will be displaying the American Scott stereo amplifiers.

Three models will be seen. The Model 260 solid state stereo amplifier features two thirty-watt (steady state) output channels and a wide range of customary Scott facilities. The latest version of the 299, complete stereo amplifier, selling at 131 guineas, and the 20 stereo amplifier, at 82 guineas will also be exhibited.



SHURE (Stand 64, Demonstration Room 349, Office 350/351).



S.M.E. (Stand 57).

SME Limited, Steyning, Sussex.

The Series II precision pick-up arms and accessories are unchanged, apart from the addition of a lightweight steel lifting handle for the cartridge shell.



SONY (Stand 49, Demonstration Room 315).

Sony UK Sales Division, Eastbrook Road, Eastern Avenue, Gloucester.

Four Japanese-manufactured tape recorders, a stereo tape deck, and a stereo pre-amplifier will be shown by Debenhams, UK Agents for the Sony equipment.

The recorders are the TC500 and TC200, two speed, four-track stereo recorders at 105 guineas and 72 guineas respectively. Then there is the TC777A, a two-track, two-speed professional mono machine at 155 guineas, and the TC600 a three-head, four-track stereo recorder at 127 guineas.

The 263D stereo tape deck incorporates four-track separate record and playback heads, two speeds, and has a beltless mechanism. It costs 38 guineas. The SRA-3 stereo record pre-amplifier designed for use with the above tape deck but can be used with any equivalent unit after making a minor adjustment.



S.T.C. (Stand 3, Office 109).

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

Two new high quality microphones and a new range of microphone stands including a low-priced boom unit will make their bow on the S.T.C. stand.

First is the tubular ribbon microphone suitable for close-talking, with a narrow cardioid directional sound pick-up. Designated the STC4119, it will cost about £25.

The STC4126 capacitor microphone in the £120 range, is suitable for use by individual artists. Available with cardioid or omni-directional characteristics, it is just over two inches long. The price includes power unit and accessories.

The three new microphone stands will be shown in prototype form. A novel collapsible floor stand has a top section that can be angled to form an extending boom. The other units are a table stand and a small desk stand, both with polished wood bases.



TANDBERG (Stand 18, Demonstration Room 222, Office 223).

Elstone Electronics Limited, Edward Street, Templar Street, Leeds 2, Yorkshire.

From Norway, the well-known Tandberg stereo tape recorders Series 6 and 7 will be shown by Elstone, in addition to the newer Series 9 and recently-introduced Series 8 mono tape recorders. This latter machine is available in two and four-track versions in the familiar Tandberg teak cases, and also as a completely portable recorder with a special fabric cabinet with lid and carrying handle.

New this year will be the Huldra AM/FM radios incorporating stereo amplifiers and loudspeakers. Used with the Series 6 tape recorders, they provide a complete stereo system. Novel intercom circuits also feature on these sets, permitting the user to listen or communicate with other parts of the house by means of an extension loudspeaker.

Also making their first appearance will be two cabinet loudspeakers, the Model 8 at 13 guineas, and the Model Hi-fi at 22 guineas. Both have 4 ohms impedance and are designed for use with the Tandberg recorders and radios.

One of the control units from their language laboratory will also be featured.



TANNOY (Stand 63, Demonstration Room 411, Office 424/409).



"TAPE RECORDING MAGAZINE" (Lounge 244).

Print and Press Services, 7 Tudor Street, London, E.C.4.

The Editor and Staff of *TAPE* will be available during the run of the show to welcome readers and other friends and give advice whenever possible.

Current and back copies of *TAPE* will be on sale, together with the latest edition of the "Tape Recording Yearbook," and copies of our series of tape handbooks, as advertised on page 213. Also available will be the Tape Time Calculator providing an at-a-glance timetable for speeds from 15/16 to 15 ips, and the binder to protect your copies of *TAPE*.



TELEFUNKEN (Stand 7, Demonstration Room 237, Office 239).

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

The standard range of German manufactured Telefunken recorders will have no additions this year. On show will be the M330 battery/mains operated machine, the four-track (Model 97) and two-track (Model 98) three-speed stereo recorders at 109 guineas, and the 95-guinea half-track two-speed mono recorder the 85.

New Truvox transistorised range —visit "TAPE" in lounge 244

Also shown will be two AM/FM tuner/amplifiers and two new hi-fi disc reproducing units.

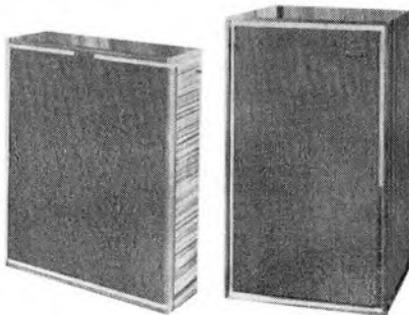


TRIO (Stand 20, Lounge 111).

Winter Trading Co. Limited, 95-99 Ladbrooke Grove, London, W.11.

The Japanese Trio range of tuners, amplifiers, and combined units will be making their second appearance at the Fair. Improved production techniques are described, and some prices have been reduced drastically.

Prices of their units range from 25 guineas for the Model FM106 Tuner which has provision for connection of FM multiplex adaptor, through 39½ guineas for the AM/FM Tuner AFE220 again with multiplex facilities, to 45 guineas for the combined tuner/stereo amplifier Model W10S including multiplex adaptor and stereo headphones.



Wharfedale's "Dalesman" (left) and "Dovedale" cabinets



TRUVOX (Stand 2, Demonstration Room 202, Office 201).

Truvox Limited, Neasden Lane, London, N.W.10.

Truvox will be showing their new range of transistorised tape recorders and tape units. These new models are described in "New Products" on page 202 of this issue.

Their complete stereo sound system including tape unit, amplifier, and loudspeakers featuring full monitoring facilities will be demonstrated.



VORTEXION (Stand 27, Demonstration Room 204, Office 240).

Vortexion Limited, 257-263 The Broadway, Wimbledon, London, S.W.19.

Three recorders will be on view and demonstrated. The CBL two-speed half-track stereo recorder at £160, will feature together with the models using the Ferrograph Series 5 deck. Both the WVA and WVB recorders employ 7½ and 3½ ips speeds with 15 and 7½ ips version also available.

The Type M8 ribbon microphone, 10/15 watt mixer amplifier, 30/50 watt amplifier, 200 watt amplifier, plus three, four, and twelve-way mixer units will also be on view and demonstrated.

WHARFEDALE (Stand 53, Demonstration Room 247, Office 262/263).

Wharfedale Wireless Works Limited, Idle, Bradford, Yorkshire.

The current Wharfedale range includes two new cabinet designs. Fitted with a new type of twelve-inch bass unit with Neoprene Surround to give exceptionally clean bass, the models are the Dovedale and Dalesman.

The former at £31 10s. is a modern version of the W2. It measures 24 x 14 x 12 inches and weighs 37 lbs. Frequency range is 25-17,000 cps, and the power output is 15 watts rms, thirty watts peak. The slimline Dalesman unit will handle eight watts at 40 cps without distortion. Frequency range is 30-15,000 and the power handling capacity is ten watts rms, twenty watts peak. At £25 10s., it measures 25 x 20 x 6½ inches and weighs 31½ lbs.



WHITELEY (Stand 60, Demonstration Room 449, Office 450).

Whiteley Electrical Radio Co. Limited, Victoria Street, Mansfield, Nottinghamshire.

The wide range of Whiteley hi-fi products including loudspeaker units, enclosures, matching equipment cabinets, amplifiers and radio tuners can again be seen this year.

The Stentorian loudspeakers vary in size from 1½ inches up to 18 inches in diameter all available with a variety of cone construction, speech coil impedance and magnet strength to suit all requirements.



WILLIMAN (Lounge 246).

K. H. Williman & Co. Limited, Blackford House, Sutton, Surrey.

VHF/FM radio tuners, mono and stereo amplifiers, pre-amplifiers, tape decks, and loudspeaker systems by Armstrong, Kelly, Planet, and Rogers, are represented by Williman, world-wide export agents for hi-fi equipment.



WILMEX (Lounge 153)

Wilmex Limited, 151-153 Clapham High Street, London, S.W.4.

Export agents specialising in audio equipment, Wilmex will be showing several lines including Ferrograph for whom they have exported for over seven years.



WILSON STEREO LIBRARY (Lounge 154).

The Wilson Stereo Library Limited, 463 Streatham High Road, London, S.W.16.

Main exhibit in Lounge 154 will be the new edition of the "Stereo Guide," containing reviews of all classical and popular stereo records released to date.

Two features of particular interest are "The other world of stereo sound" a not too serious look at demonstration records by Donald Aldous, Technical Editor of *Audio Record Review*, and "How to obtain the best stereo in your listening room."

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A Free 600 ft. Tape with every 5^{3/4} 1200 ft. LONG PLAY MASTERTAPE YOU BUY. SAVE 24/9 WHILE STOCKS LAST



Mastertape

TODAY'S TOP TAPE

Manufactured in England by

Mastertape (MAGNETIC) LIMITED, COLNBROOK, SLOUGH, BUCKS.

TAPE AND CINE. PETER RYDE concludes his series of articles by discussing the methods used to achieve lip synchronisation during and after filming.

Recording in lip-sync

PRODUCING films in lip-sync can be rather a complex business, and it is too involved to be described fully in a single article. For the present, it is impossible to do more than give some indication of the various approaches which may be followed and to suggest techniques with which readers might care to experiment.

First of all, there are one or two introductory points that need clearing up right at the start. The first is that lip-sync film recordings are not always made on tape. A more convenient medium is magnetic film, which has the physical dimensions of photographic film, but is coated all over one side with magnetic oxide.

The advantages of magnetic film are, first, that it is tough enough to be driven by its perforations, whereas perforated tape is not; this makes it easier to keep sync; secondly, that magnetic film is the same length, frame for frame, as the corresponding picture film, which greatly simplifies editing; and thirdly, that its considerable width allows for several parallel tracks. Magnetic film is widely used for 16 and 35mm work, but not, as yet, for 8mm.

The next point is that when the sound and picture are shot together, which is not always the case, they are *not* normally recorded on the same film. The "single-system" method is perfectly possible, using striped unexposed stock, and it is a technique sometimes used for reportage and news work; but it has the disadvantage that because of the separation between the sound and the picture, the film cannot be edited unless the sound is first re-recorded on to another film or tape. It is usually simpler to make a separate recording in the first place.

But making a separate recording means that just as the projector and recorder have to be linked with a synchroniser for playback, so the camera and recorder must be similarly synchronised whilst shooting.

In some cases, the link is physical; a special magnetic film recorder can be fastened to the camera, so that one motor will drive both. Alternatively, the link can be electrical, with matched camera and recorder motors phase locked to the supply. Or there is Synchronpulse, a method by which a commutator in the camera registers intermittent pulses on the lower track of the tape (which is not locked in any way to the camera). Afterwards, the tape can be kept in sync by amplifying the pulses and feeding the current to a neon tube which illuminates a strobe disc driven by the film.

Recently, a device specifically designed for amateurs, called the Rotosync, was de-

veloped, which enabled perforated tape on an ordinary recorder to be synchronised with any electrically driven 8mm camera. But nothing seems to have come of it yet, and the real amateur who wants to shoot lip-sync using tape usually has to work without a synchroniser. In this case, you merely adjust the camera speed as accurately as you can with a special timing loop, and then shoot wild, keeping the shots very short to prevent too much sync drift. Afterwards, you juggle with the tapes until you get reasonable sync.

The third thing to realise is that lip-sync recordings are by no means invariably made at the time of shooting the film. There are many reasons for this. Acoustic conditions on location may be unsuitable; background noise may be too prominent, or of a kind that would show obvious breaks when the recordings were edited to match the picture; it may be impossible to get a good enough recording without including the microphone in the picture, and so on. For these, and similar reasons, sound for location shots is usually dubbed on afterwards, and though a recording is probably made at the time of shooting, this will be used merely as a guide track so that the actors have an accurate record of their precise words and inflexions.

If you are going to produce a lip-sync film, you can record the sound *before* you shoot, *while* you shoot, or *after* you shoot. All three techniques are used, and each has its own particular applications.



A synchroflex magnetic film recorder fitted to the side of a Bolex H.16 for shooting in lip-sync. The large chequered bag is the soundproof blimp which zips up round the camera. The amplifier is hanging on the tripod below the blimp

Pre-recording: This technique, by which the sound is recorded before the film is shot, is used when a very close correspondence is required between the action and a complex track. The commonest examples are musical numbers where a large cast is involved, and, at quite the opposite extreme, cartoons. In both cases the action has to be worked out very accurately beforehand anyway, so there are no timing problems about recording the sound first.

Lip-sync cartoons are quite within the bounds of possibility for the amateur—provided he has the patience and ability to do the actual animation work. The procedure is, in theory, quite simple. First of all, you plan the film very carefully; then you record the sound on perforated tape. You can now draw up a shooting schedule by counting the number of tape "frames" between the various sounds, and exposing one frame of film for each "frame" of tape. Provided the counting doesn't get out of step, you can achieve 100 per cent sync between picture and sound, with all the effects absolutely spot-on.

Alternatively, you might make the master recording on striped or magnetic film and use this to enable you to count frames as before. Later, you would dub from the master to the striped picture film, using a film recorder linked to the projector to ensure that the transfer took place in perfect sync.

If you are working on 16mm and wish to produce a cartoon with an optical sound track, the procedure is identical, except that you would make your first recording on plain tape, and then have it transferred by the labs to optical. A workprint from the optical sound master would be used for counting the frames, and the final married print would be made from the sound and picture masters together.

If the pre-recording technique is to be used with live action, you first record the sound, then lock the camera and recorder in sync, and play back the recording while shooting. The actors time their actions to coincide with the sounds—you hope.

Simultaneous Recording: This is used a good deal for news and reportage work, and also for work in the studio where the acoustic conditions are under close control. Whether you record straight on to the film, or use a separate tape or magnetic film, the first problem is how to suppress the camera noise. In most cases, the entire camera has to be enclosed in a soundproof wrapping or box, called a blimp, which has holes or glass ports for the lens, viewfinder, etc.

The second point is that you have to make start marks on the film and on the recording, if the two are separate, otherwise the sound and picture could never be started up in sync later on. Marking is done with a device called a clapper board. The little slate or blackboard with the shot number on it has a hinged flap at the top. This flap is brought down smartly just after the camera and recorder have been started. The frame of film in which the flap touches the board can easily be identified when the film is developed, and the bang on the track is also easy to locate. These two act as the start marks, and are trimmed off when the film is joined up at the editing stage.

Finally, there is the question of how to get a good recording without including the microphone, or its shadow, in the picture. For interviews, etc., the presence of the microphone is an acceptable convention, and it is rarely hidden, but for most work it is preferable to exclude it. So either the

(Continued on page 201)

TELEVISION signals have the same characteristics as music, speech and coded data—they are imitated by a two-dimensional electrical signal, the two dimensions being instantaneous voltage and time. The magnetic imitation of these is the remanent strength of a magnetic field, and the time element is the speed of scanning or reading the tape.

Although it is possible to record television signals, there are a number of "snags" which make the familiar techniques inadequate, and perhaps we should begin by outlining the two main difficulties.

SPECTRUM

A very acceptable audio tape recorder can record and reproduce information in the spectrum of frequencies from (say) 40 cps to 20,000 cps—that's about six octaves. This corresponds to the range of pitches audible to the human ear—or approximately, at least.

The television spectrum, on the other hand, occupies a spectrum of from 0 cps to 3,000,000 cps, corresponding to mean picture brightness, and the finest detail reproducible, respectively. (The domestic 405-line standard is assumed throughout unless otherwise stated.)

This is comparatively a very wide spec-

TAPE RECORDING TELEVISION

Music, speech, coded data, in fact anything that can be transformed into an electrical analogue can be recorded on magnetic tape, so why not television? In this new series of articles, JOHN VALENTINE describes the principles involved, the problems and how they are overcome, and describes a typical specification for a professional video recorder.

trum. If you will allow the stretching of an arithmetical point, and let me say that the lower limit is 50 cps (the rate of picture repetition) the spectrum is seventeen octaves.

The ultimate limit of spectrum that can be recorded with the tape is about nine octaves—this is due to the fact that short magnets are not as good at retaining their fields as long ones. It is, of course, possible to make a tape response line or by

"cheating" with equalisation networks, but after a time, one runs up against the problem of signal-to-noise ratio, making further efforts at equalisation unprofitable.

FREQUENCY LIMIT

Equalisation techniques assumed: the so-called "extinction" frequency will inevitably be reached, where the little magnets laid down on the tape by the recording process equal in length the recording gap width, resulting in zero net induced voltage. Any frequency beyond extinction and in the vicinity are of no practical use at all. Preferably the tape magnet length should be several times the gap width.

Assuming a 15 ips tape speed, and using the smallest possible gap, the extinction point is still lower than 50,000 cps—a long way short of 3 Mc/s. The only way out is to make the tape speed high in proportion. But then, nobody wants a tape recorder that looks like a twin-rotor helicopter, or to buy and handle tape spools yards across. It could make the gentle art of tape recording into a blood-sport for millionaires, if it is done by merely increasing tape transport speed.

But even if it were practical, nine octaves is the limit so it wouldn't do much good.

A RADIO-TYPE CARRIER?

A quick and easy solution to the first difficulty, is, of course, to modulate the unwanted signal on to a radio carrier and record that. As an example of a radio carrier, the BBC Channel 1 vision signal is impressed on an AM carrier of 45 Mc/s, so that peak white is 100 per cent power, black level is 30 per cent power, and synchronism 0 per cent power.

This gives rise to sidebands 3 Mc/s either side of the carrier frequency, the upper one of which is partly suppressed, artificially, in the interest of bandspace economy. The corresponding sound channel is applied in a narrow band at $41\frac{1}{2}$ Mc/s—as a sort of afterthought.

This achieves, all at once, a bandwidth compression to under 1/10th octave and one of the difficulties is removed. But the carrier frequency is impossibly high. In practice, vision tape recorders do use a modulation system—though with the difference that the carrier used is much lower in frequency, less than 10 Mc/s, and FM (frequency modulation) is used, not AM as in TV broadcasting.

FM offers many advantages, well known

ABRIDGED SPECIFICATION OF THE AMPEX VIDEO RECORDER

Head drum (headwheel) diameter: two inches.

Head tip protrusion: .001 inches to .003 inches according to wear.

Head speed: 250 revs/sec = 15,000 rpm.

Head/tape speed: 1570 ips (= $2\pi \times 250$ ips).

Head gaps: $\frac{1}{6000}$ inches approx.

Longitudinal tape speed: 15.6 ips or 7.8 ips (degraded performance).

Extinction frequency: $\frac{V \text{ (tape speed)}}{\lambda \text{ (gap width)}} = \frac{1570}{.00166} \text{ cps or } 9 \text{ Mc/s approx.}$

Video track width: .01 inches.

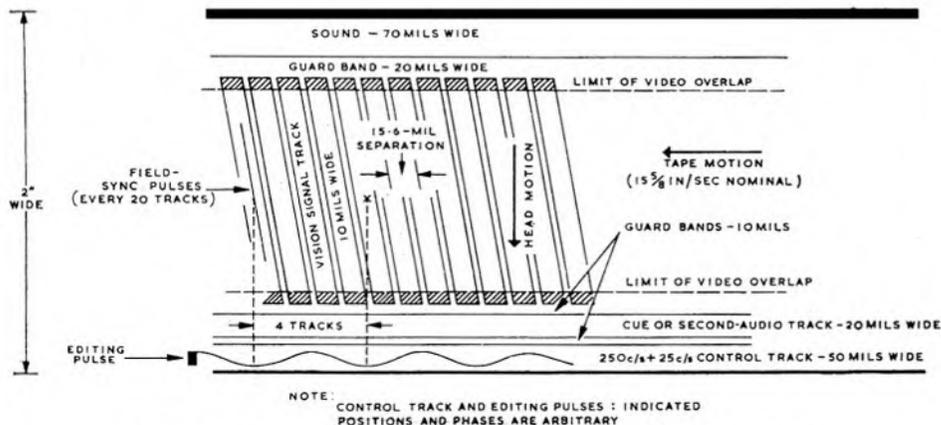
Number of video lines per track: 12.9 (405 lines), 19.8 (625 lines).

Number of usable lines per track: 11.7 (405 lines), 18 (625 lines).

Tracks per complete TV picture: forty.

Audio track: recorded on top edge of tape by conventional head separated from corresponding video by 0.6 seconds (14.8 frames).

Servo control and editing track: recorded on bottom edge conventionally: no bias necessary.



Arrangement of tracks for video tape-recording (405 line standards)

TAPE RECORDING TELEVISION

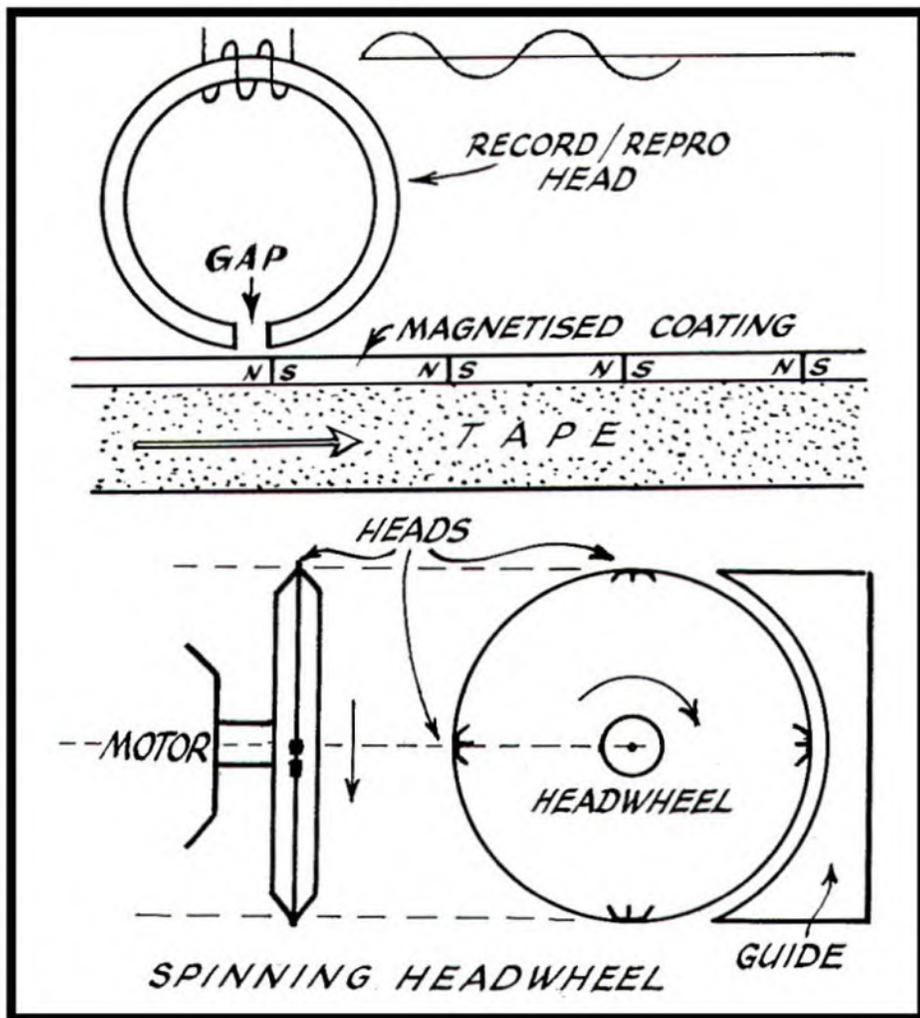
Music, speech, coded data, in fact anything that can be transformed into an electrical analogue can be recorded on magnetic tape, so why not television? In this new series of articles, JOHN VALENTINE describes the principles involved, the problems and how they are overcome, and describes a typical specification for a professional video recorder.

to Hi-Fi enthusiasts. Notably you can, at some stage in the receiver, severely clip the signal taking the interference off with the signal amplitude extremes, while leaving the modulation sense intact.

So, mainly with this advantage in mind a FM system is used as a signal carrier. For the domestic system black level = 5 Mc/s and peak-white is 6.8 Mc/s, but frequencies vary for different line standards. But what of the problem of recording these high frequencies?

TAPE SCRAMBLING

A high head/tape speed is achieved by laterally scanning, i.e. across the width, using a two-inch wide tape, with a head gap of only about 1/6000-inch. Four record/reproduction heads are mounted mutually at right angles around the diameter of a two-inch disc, termed the headwheel, which is rotated at 15,000 rpm. The four heads sequentially scan the tape in lateral stripes as the headwheel spins, and each is in contact with the tape through 120 degrees of arc for each revolution. By this method, a relative head speed of about 1,580 inches per second, that's about 100 mph, is obtained. Meanwhile the tape is moved longitudinally at about 15 ips. Conventional



audio heads rub the tape on its passage, and the sound track is recorded conventionally. (We will deal more fully with this aspect later.)

Alongside the spinning video head, there is a curved guide, against which the tape is held by a vacuum: the curvature of the guide

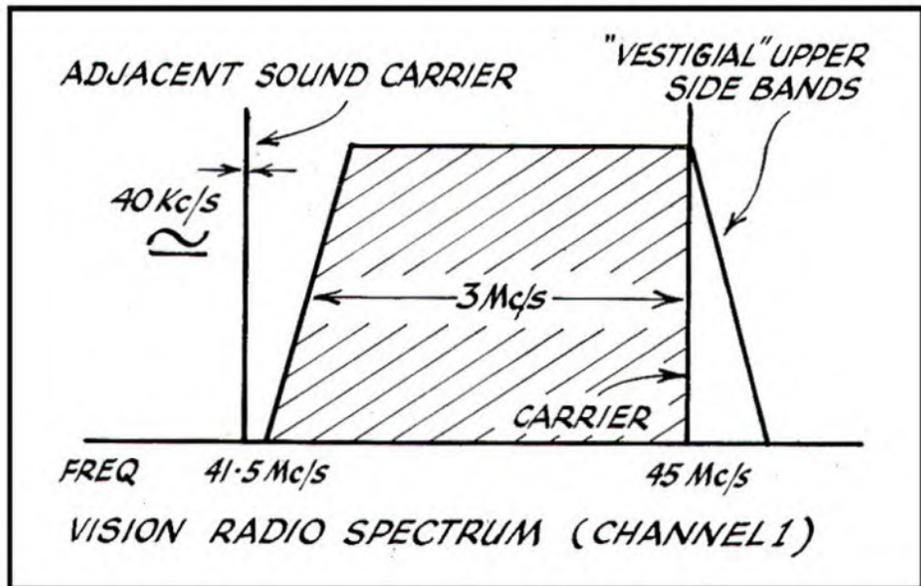
is such that the tape rests snugly up against the headwheel.

As a measure of economy in material achieved, a twelve-inch diameter spool of tape (4,800 ft.), two inches wide by 1/1000-inch thick, will record one hour of television programme. It will contain as much recorded information as an 80 ft. wide reel of conventional quarter-inch tape! The material commonly used is "Mylar," a substance identical to "Terylene," coated with the Gamma form of iron oxide Fe_2O_3 .

So much for the vision track. There have to be others of course.

However, it's not as easy as it all sounds. This first article is intended as a general discussion of the more serious problems encountered, and in the most general way, a proposition of the way in which they are overcome. As with most inventions, the principle to those "in the know" is almost childishly simple, while the technology and physical realisation can be quite complex and costly.

The following articles in this series will attempt a more detailed account of television recording today, and to get down to actual cases rather than principles. It is intended also to outline the techniques of editing video tapes and to discuss what a sound tape recordist can learn from a knowledge of television tape recorders, and to describe the revolution (in more than one sense) that magnetic recording has brought about in the television industry—and how it affects the home viewer.



with a tape recorder: a new series on location recording. This month, JOHN CORDEAUX recounts some of his adventures—technical and otherwise—getting the topics taped as a

MY own journey into stereo began several years ago in the Far East. I had been seconded by the BBC to Radio Sarawak as Head of Programmes. At the end of 1960, I said to the senior Sarawakian engineer, Mr. Chung Lian Fatt, that it was a shame it was technically impossible for a small station like ours to transmit in stereo—and thus be the first radio station in South East Asia to do so. "What?" replied Chung Lian Fatt, "nothing is ever impossible for Radio Sarawak!" And nor ever was it, technically speaking, when Chung Lian Fatt was presented with a challenge: resulting, incidentally, in about the finest, most modern small broadcasting station East of Suez. So it was, then, that regular stereophonic broadcasts making use of Radio Sarawak's two medium-wave transmitters began in May 1961—the first stereo transmissions in that part of the world for certain.

"Stereo on Sundays" was, nevertheless, a bit of a lash-up. Unfortunately,

we had no stereo tape recorder: even Chung Lian Fatt could not persuade two of our Ampex machines to run in complete sync. And so we had to rely a good deal on the "eternal turntable." We did, however, have a "live" local band and once put on a short Malay drama—with actors running about all over the studio. "Stereo on Sundays" was introduced by (far left) Mr. Stereo, the news editor, Chew Hock Guan, and by (far right) Miss Stereo, a beautiful Chinese girl called Anne Tan. One of the results of our experiments, because in all honesty that is what they were, was achieving great popularity with all the radio shops in Kuching whose sale of transistor sets rocketed up.

Those Sunday radio adventures in Radio Sarawak served me in good stereo stead on my return to the United Kingdom. Some

of the money that I had been able to save while working in that far-flung radio outpost was put to acquiring a Revox E36. On this machine I really began learning the craft of making acceptable stereophonic recordings. My early efforts, though, nearly all had lots of "left" and lots of "right"—and lots of gaping "holes-in-the-middle." I burnt my fingers in attempting every gimmick I could think up, and literally also on one occasion because this early Revox had a nasty habit of getting extremely hot. In fact, by producing a number of plastic spools that had actually split with the heat, I was able, on favourable terms to myself, to exchange this model for the cooler and superior Revox F36. A year ago, incidentally, I made another exchange, this time acquiring the very fine Revox 736. Now this machine is a real beauty and continues to serve me well as my basic recorder.

But to go back again about two years. I was yearning to get out and about in stereo, and at this time it was technically impossible to do so—unless one was prepared to be limited by the considerable weight of (in my

Stereophile at large

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.. TK.5	55/-
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.. TK.24	55/-
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.. 3534	87/-

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Robuk RK.3	67/6
Sony 521	90/-
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Revox	84/-
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It is in world-wide use for high-quality broadcasting, recording and public address both by the amateur and professional.

The Parabolic Reflector is its natural partner; it focuses a distant sound-source onto the microphone head, greatly amplifying it without loss of realism and without unwanted side-noises.

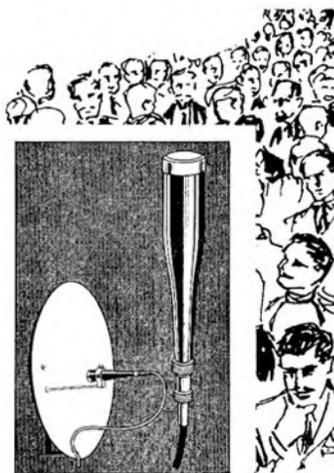
Low impedance microphone, complete with connector and 18 ft. screened lead £8.

Medium and high impedance models £9. Parabolic Reflector 2ft. diameter complete with microphone holders £6 5s.

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Feltham, Middx. FEL 2657



case) a Revox and, of course, by the availability of a mains supply. My work in the BBC was taking me well away from base (I was a Producer of the early morning "Today" programme), and I generally did my interviewing and obtained my sound effects on an exciting new mono machine I had acquired—the Uher 4000 Report. But would that I could have got in stereo, for instance, old Dinks Cooper, a Southwold shellback, telling how he once caught a mermaid in his net—complete with the stereo chug-chug of the outboard motor on his fishing boat and the gulls crying and screaming overhead. A slightly less fishy story it might have been, too, in stereo!

And then, my good friends in Bosch of Great Portland Street gave me a tip-off. Uher were bringing out a stereo model of the 4000 and 4004 Report. I was first in the queue for it—Portland Place is just round the corner, anyway—and another "swap" took place. It has turned out to be the most satisfactory bit of swapping that I have ever done. At the time I thought my Uher 4004 (Stereo) Report was a box of electronic magic. After two years of recordings made with it in over ten countries, I know it is. Mind you, you have got to rub the magic box the right way up for the genie in it to work his stereo marvels. But once the operational techniques of stereophonic recording away from base have been mastered, the whole wide world (and I do mean wide) can be transplanted to the sitting-room of your own home.

When I first took delivery of my Uher Stereo, I went really tape-happy for a few months: berserk even. Looking back through my stereo archives, I find that my own early experimental transplantations included the First Act of a Musical (in contravention of every possible copyright act) recorded from the wings of a London stage, a Twist session at a local dance hall, a student practising the organ in Norwich cathedral, beery lunchtime chatter in the public bar of a pub, rush-hour traffic on the Great North Road, and last, but by no means least when it came to evoking reality, the stereo sibilance of a score of cisterns chuckling away in the gents' lavatory on the pier of a seaside town.

One of the two rules I taught myself during this honeymoon period was always to wear headphones when recording ("hi-fi" ones, of course, and I prefer the very light AKG set at about £7 10s. a pair). The other rule was to deny myself the cheap "stereo thrill" of, so to speak, not letting my left ear know what my right ear was doing. Although the two little VU meters on the Uher are quite accurate, it is really impossible to balance a source of stereo sound without wearing a headset. You must carefully place the microphones, or hold them very still, and adjust the two gain controls so that what you hear on the headphones is in the same audio perspective as the sounds you actually hear each time "in the flesh," without headphones. If you take the trouble to do this you will avoid the very common "hole-in-the-middle" effect, which, on playback, not only becomes extremely irritating, but is far from being true stereo. "Stereo" comes from the Greek root *stereos* which means "solid,"

Right, the author records BBC commentator Wynford Vaughan Thomas during a ride on the Ghost Train at Barnet's famous annual Horse Fair



and the word "stereophony" itself therefore literally means "solid sound"—sound in width and depth.

With the Uher 4000 (Stereo) Report, or with any other stereo recorder, a choice of cardioid, "figure of eight," but not omnidirectional microphones can be used. But I have made some of the recordings that have pleased me most with the coincidental stereo microphone (two cardioids, one on top of the other) available with the recorder itself. These particular microphones can be separated, but generally when I have adopted the "separation" technique, I have used two excellent Beyer cardioids (obtainable from Fi-Cord International). These I attach to home-made extending arms (brass tubes) and mount on a light-weight camera tripod. Always, though, when microphones are separated, extra care must be taken not to leave that hole-in-the-middle. And it is so easy to be careless over this! Mind you, this does not mean that, by intent, you cannot have fun and games. In one recording

NEXT MONTH

Next month, our "Stereophile at Large," John Cordeaux, will be giving some more practical stereo-recording tips.

John Cordeaux has compiled three programmes from some of the many recordings he made overseas last year, during duty trips to the warmer parts of the Commonwealth for Thomson Television (International). He will be presenting these programmes—under the title "The More we are Together"—on the BBC Home Service this month. The programmes can be heard between 11.30 a.m. and 12 noon on Thursdays, April 8, 22 and 29.

Although initially being broadcast in mono, of course, John made all the original recordings in stereo—and, in fact, the BBC has actually produced the three programmes stereophonically for possible repeat transmission in the future.

I made of a dance band, I pushed the saxophones well out to the left and positioned the guitar at the extreme right of the "picture." But I also took the precaution to see that that hole was well and truly plugged by rhythm and drums.

In the Autumn of 1963, my Uher and I were put to our biggest test to date. The BBC decided to produce an "actuality"

stereo feature. This had never been attempted before by any broadcasting organisation so far as was known, nor, I believe, has such a production ever been undertaken since. The famous annual Horse Fair at Barnet was the object of the exercise and one of the BBC's most distinguished radio producers, Douglas Cleverdon, was in charge of the operation. Wynford Vaughan Thomas introduced the programme and, together with a small host of highly-skilled engineers, a rollicking time was had by all—in the rumbustious company of hundreds of excessively high-spirited horses, dealers, gypsies and human and horsey sound effects.

In the adjoining field was the Fun Fair—another glorious, swinging, stereo opportunity if ever there was one. One of the highlights of our Fun Fair recordings was a ride on the ghost train in which Wynford Vaughan Thomas and I added our own screams to the demoniacal (if mechanical) yells punctuating the smelly, ghostly railroad tunnel. The day ended outdoors with a splendid firework display; resulting finally in rockets and crackers jumping out of our left- and right-hand loudspeakers—and, of course, also from the centre of the stereo stage! The recordings made at Barnet were assembled and edited over several weeks, and the final programme was broadcast (in stereo) by the BBC just before Christmas 1963.

Early last year I was appointed Head of Sound Broadcasting in Thomson Television (International), and so resigned from the BBC after seventeen extraordinarily happy and fulfilling radio years. Thomson Television is doing a great deal on a world-wide scale to help developing countries, particularly in the Commonwealth, to start up television and to improve their existing sound radio services. Such pioneering work interests me tremendously. During last year I have myself visited nearly a dozen countries and found—but I had already found this out many years ago—that there exists a veritable brotherhood of broadcasters the world over. I believe this brotherhood includes, in some measure, all of us—amateurs just as much as professionals—who like "messing about with microphones." And within that brotherhood there surely exists what could be called a fraternity of recordists, those of us who, whether in studio or sitting-room, communicate to others by means of the spoken word, songs and sounds—on tape.

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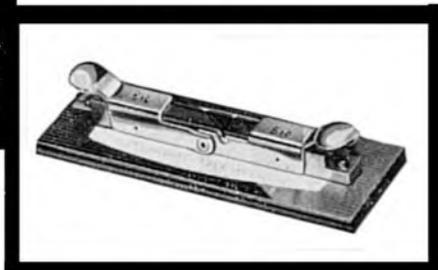
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Dramatape miscellany

By PERSPECTIVE

I WAS recently invited to a friendly dramatape session in Ashford, Kent. One of the guests sat at the microphone—and he was holding a large tea-cup almost flat over one ear.

"What's he doing?" I whispered, fascinated.

To my chagrin, the producer told me that the idea was taken from my own *Dramatape Guide*. The actor was supposed to be "telephoning" a girl.

Well, the book had to suffer many editorial cuts; but I still don't think the text is as obscure as all that!

The idea, for telephone scenes, was not to "listen" to the cup—but to speak into it. The "hollowness" gives an impression that the character is speaking into a real telephone. (I'm not referring to the distant-end tinny voice). In reality, we would hear no such "hollowness"—the mouthpiece is much too shallow. But, for drama-in-sound, the slight exaggeration (from a small cup) helps to suggest that the character is gripping a receiver. We can't show him gripping it—so we provide a substitute impression. Indeed, a sudden increase in "hollowness" can suggest that the character is gripping the receiver very tightly—perhaps in excitement or fear.

I hope this is now more obvious.

WHICH END?

Another point about telephones has puzzled several people over the years. When (they ask) should the *distant-end voice* be included in a dramatape?

The answer (I suggest) depends on the setting of the scene. A character might be standing near the microphone. The telephone rings—supposedly on the far side of the room. So he turns away to answer it. . . .

In that case, our dramatic convention implies that the distant caller is unheard. We are too far away to overhear the tinny voice in the receiver.

But what if the telephone rings *close-by*? In this case, we can overhear the caller—rather as we can in real life.

So, applying this convention, we must always ensure that a solo telephone performance takes place "in the distance." Not too far away—just enough to avoid the obligation of providing the tinny voice.

THE DISTANT VOICE

Telephone conversations (in plays) are usually brief; and, where required, there is a simple method for producing a tinny "distant" voice. The gain-control is turned very low, and the actor concerned speaks loudly against the face of any microphone

other than a ribbon. The gain-control is then returned to normal level for the "near-end" actor. This technique gives rise to short lengths of surplus tape between the two voices—and this surplus is cut out later.

Yes, I know there are other methods. But I am still seizing every opportunity of advocating cutting-and-splicing. And I hope every advanced society adopts the same policy towards their newcomers. To set simple editing exercises is the only way of developing audio sensibility.

EXCHANGE EFFECTS, ETC.

A successful dramatape producer should have a good idea of telephone-exchange routine. Actors, too. Amateur actors (and some professionals) are rarely convincing as operators. They should remember that trained operators have special phrases for almost every eventuality—from an emergency call to directory inquiry. And the routine of the board is a fixed pattern—despite the variety and possible drama of the traffic.

Try, therefore, to visit your nearest auto-manual and manual exchanges: these will yield all the information and effects you need. The G.P.O. are most helpful, although visits for single persons are not generally arranged. It is best to make an "official" visit as an entire society; but, needless to say, a successful tour depends on the personality of the producer. (Take proper care to acknowledge the help received if you write up the visit for the local paper).

The day-time is best for studying ordinary routine; any recording is best left for an evening visit when the exchange is more relaxed. You won't, of course, be allowed to record subscriber-traffic; but you may be allowed to record mock calls on a vacant switchboard. The "tone" (dialling, ringing, engaged, etc.) are recorded from the demonstration jacks; other effects (e.g., coin-boxes and buttons) are recordable from

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private and public instruments. (Note: unauthorised tampering with apparatus, e.g., connecting audio-leads, is strictly *verboten*).

A telephone bell should be recorded in a dead acoustic, and is easily faked if you have no private telephone. But the characteristic sound of a receiver being "cradled" is surprisingly hard to imitate. It can be done, but it's easier to buy a surplus instrument complete with dial.

OLD SHAVER

Do you use "Imperial Leather After-shave Lotion"?

I don't. But I shall receive yet another bottle this month—for my birthday.

I never turn it down. It's excellent for removing the oxide coating from old tapes. (I've tried other solvents, but the fumes make me cross-eyed).

Transparent tape is useful for making "overlays"—e.g., in transferring cue-marks from the back of one tape to another. Or for making a flexible "tape measure" for head-to-head distances etc.

Two-minute tape sketch by David Haines

A monthly exercise in perspective, acoustics and sound-effects

MANY simple sketches can be produced that exploit the telephone, used as described above. Here is a typical situation.

THE TELEPHONE CALL

(FADE IN ON RINGING TELEPHONE BELL. RECEIVER LIFTED: RINGING STOPS).

HOUSEWIFE: (*near voice*) Hello? This is Lilac Grove 3101.

SALESMAN: (*distant voice*) Good morning, Madam. (*briskly*) Your number has been chosen, at random, by the manufacturers of the famous breakfast-cereal "Cruncho-Muncho."

HOUSEWIFE: What name did you say?

SALESMAN: "Cruncho-Muncho!"

HOUSEWIFE: (*apologetic*) I'm sorry, but I never eat it.

SALESMAN: (*firmlly*) It's very popular, Madam!

HOUSEWIFE: I can't stand the taste, you see.

SALESMAN: Nevertheless, you have been chosen as the lucky recipient of a lifetime's supply.

HOUSEWIFE: I don't want it, thank you—

SALESMAN: At this very moment, while we are talking, our van is speeding towards your address!

HOUSEWIFE: (*horrified*) With a lifetime's supply?

SALESMAN: Oh, no—just your first weekly consignment.

HOUSEWIFE: (*desperately*) I tell you, not one of us in the whole family eats "Cruncho-Muncho."

SALESMAN: (*quickly*) So you're a family, are you? That qualifies you for our especially-large packets of "Cruncho-Muncho."

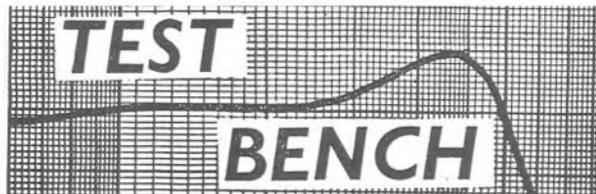
HOUSEWIFE: (*frantic*) We don't want them, I tell you!

SALESMAN: The driver should be ringing your door-bell any minute now, Madam. Goodbye—and happy crunching.

HOUSEWIFE: (*hysterically*) I won't accept this offer! D'you hear me? I won't accept it!

SALESMAN: (*peevishly, after a pause*) I wish you'd show a little more co-operation.

We've got to get rid of the beastly stuff somehow.



REVOX 736

By John Aldred

THE Revox 736 is the latest model of this high grade stereophonic tape recorder, manufactured by Messrs. Willi Studer of Switzerland who also market professional recording equipment. The most outstanding feature of the 736 is the excellent tape deck and motor system. Far superior to any other recorder in the domestic or semi-professional class, it makes this machine capable of continuous use over long periods of time. Other noteworthy features include solenoid operated tape transport, hubs which accept 10½-inch spools (including NAB, twin VU meters, mixing, echo, double tracking, multiplay, tape or direct monitoring, six watt mono power amplifier, and a "Slide-o-matic" accessory for use with automatic transparency projectors.

The Revox 736 is available in two and four-track versions, both of which have

exactly the same facilities including tape speeds of 7½ and 3¼ ips. The complete recorder consists of tape deck and amplifier assembled on an integral frame, and fitted in a wood case with polystyrene lid and bottom cover. A robust carrying handle is attached to one end of the case, and the overall weight is 48 lb.

TAPE DECK

The tape deck itself accounts for much of this weight, which provides a clue to the sturdiness of the design. In fact the deck has changed very little since the Revox E36 was reviewed in this magazine some time ago. The tape transport system is still powered by three Papst motors with external rotors, the capstan motor directly driving a large flywheel and capstan assembly. All these components are mounted on a single casting, together with the rubber pressure roller and its bearing, and account for the extremely steady running of this recorder.

The spool hubs are now spaced so that the 10½-inch spools with a standard centre can be used, or NAB spools with a simple adaptor, and each spool shaft has a sprung spool retainer. When using seven-inch spools or smaller, it is now possible to reduce the

voltage applied to the spooling motors by means of a tape tension switch.

The tape transport is operated by a row of five push-buttons, fast forward, rewind, stop, run, and record, which select the appropriate function and energise the solenoids on the brakes and rubber pressure roller. A tape-operated autostop, consisting of a sprung tape guide and micro-switch, operates on all functions, whilst a remote control cable can be supplied which covers the stop and run functions. The usual three digit tape position indicator is also to be found, complete with a push-button reset.

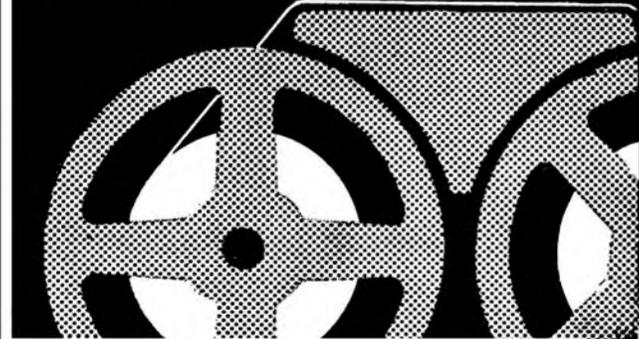
There are three sets of stacked heads, erase, record, and replay, all mounted on a strong cross bar attached to the main motor casting. Each head is completely adjustable for height and azimuth, although the adjusting screws are set and sealed at the factory. Following professional practice, the three heads are mounted in an arc without pressure pads, but a mu-metal shield is placed across the front of the replay head when the machine is running to minimise any traces of hum.

ELECTRONICS

The comprehensive amplifier system of the Revox consists of a number of integrated units. These include two pre-amplifiers, two record amplifiers, two replay amplifiers, the power amplifier, and the erase/bias oscillator. The two VU meters also have their own amplifying stages. This arrangement requires twelve standard type valves, eleven of which are mounted in line at the base of the recorder with their associated circuitry attached to pillars below each valveholder. The remaining valve is the push-pull oscillator for erase and bias, which is mounted on a separate printed circuit.

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The usual hum problems associated with valve circuits have been entirely eliminated in the Revox by the use of DC on the heaters of the early stages. This idea is by no means original, but is only found on high class recorders.

All input and output connections are made on a rear panel with standard phono plugs. Each channel has three inputs, microphone at 0.5 megohm, radio (or gram) at 1.0 megohm, and diode at 47 K ohms with adjustable sensitivity. Cathode follower outputs are provided from each tape replay amplifier, either switched for mono or unswitched for stereo, and a socket for an extension loudspeaker of 5 ohms impedance.

The monitoring amplifier and internal loudspeaker can be switched to select direct or tape signals from either channel, or a combined tape replay from both channels. Insertion of the extension plug mutes the internal speaker, but with the plug only half way in both remain operative. The twin VU meters remain in circuit continuously, and they can be used to set the correct recording level before starting the tape mechanism. The meters are calibrated from -20 to +3 VU's, and are set back 6 dB to avoid overloading of signal peaks.

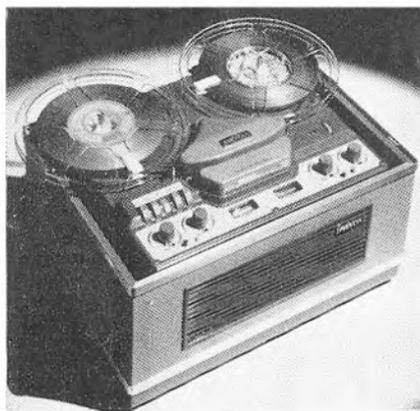
CONTROLS

The amplifier controls are divided into two groups, *play* on the left and *record* on the right. The record controls consist of a milled perspex input selector and concentric volume control for each channel, and two centrally mounted push-buttons for track selection—track 1 (mono), track 2 (mono), or stereo. When recording mono, both record pre-amplifiers are in parallel to permit mixing of any two inputs. An additional position on the input selector permits a tape replay from one track to be re-recorded into the other (multiplay), or to provide a feedback on one channel to give an echo effect.

The play controls concern the monitoring amplifier, and consist of an on/off switch, volume and tone controls, and an input selector switch with a milled perspex disc. Two centrally mounted push-buttons select the required recording speed by pole-changing the motor, or permit the continuously running motor to be switched off altogether. It will be apparent, therefore, that a great number of facilities have been packed into a small space, which makes operation of the recorder comparatively easy.

SLIDE-O-MATIC

This accessory takes the form of small plastic box which can be comfortably held in the hand, and contains a printed circuit transistor amplifier for recording pulses, together with a small relay to operate a transparency projector when the pulses are replayed. A triple lead connects to the radio input of channel 2, the cathode follower of channel 2, and the recorder remote socket.



There are three controls incorporated, a recorder stop/start, coder (for pulse recording), and a slide button (for independent slide changing). The use of this accessory can extend the scope of the Revox beyond projectors, such as operating models or other tape recorders.

PERFORMANCE

Due to a first-class electronic system and a well designed tape deck, it is hard to find any fault or flaw in the recording and replay facilities of the Revox 736. The overall frequency response of 40-18,000 cps (+2/-3 dB) as quoted by the manufacturers is extremely accurate, and does not seem to vary more than 1 dB between channels. We suspect that this accuracy is also maintained on all models. The signal-to-noise ratio, an item often misquoted for sales promotion, is in the order of 55 dB: although I must state that one channel was 3 dB better off than the other.

The reproduction of all frequencies was perfectly clean and free from undesirable distortion, both from the cathode follower sockets and the monitor amplifier. The recording characteristic conforms to the latest CCIR standard of 70 micro-seconds for 7½ ips, and 140 micro-seconds for 3¼ ips. The cathode follower sockets are fed with an already equalised signal, and the tone control affects the monitoring amplifier only. This is a bass lift circuit which has two main functions, to improve the reproduction through the internal loudspeaker and restore some of the bass to NARTB recordings.

The multiplay facility operates easily and efficiently, the separate record and replay heads eliminating all fears of feedback and crosstalk. A track can be re-recorded by means of the internal circuit, or taken from a cathode follower and fed into one of the inputs if extra frequency compensation is required. The echo effect is only effective at a tape speed of 7½ ips, due to the distance between the record and replay heads. At 3¼ ips the result is too dis-jointed to pass as reverberation, and remains as a single echo. Care must be taken, even at 7½ ips, to restrict

the amount of echo introduced. If the loop gain is more than unity, instability will result.

The absence of any pressure pads does not mean an increase in tape drop-outs or a loss of high frequency response, due to the tension under which the tape is held. But of course trouble will be experienced if buckled or damaged tape is used.

COMMENT

The Revox 736 is one of those borderline machines which can easily intrude into the guarded realm of the professional recordist. In fact I know many professionals who already use the Revox, and make no secret of the fact. But the sight of ordinary phono plugs and sockets is a bit of a let down for a recorder like this, even though these connectors are now an accepted standard. I would have preferred to see DIN sockets.

Nevertheless the Revox will faithfully reproduce any audio signal which is fed into the recording amplifiers. Any distortion I encountered always seemed to be present in the original signal before recording, and could not be attributed to the Revox (a most welcome change). I also admired the way in which all signals fed into the monitoring amplifier were perfectly balanced, meaning that there was no sudden jump in volume level when switched from one to another. Of course the cathode follower outputs should be used for the best reproduction, together with a good stereo power amplifier.

I did notice one strange habit of the tape deck, and that was a slight snatch every time the run button was pressed. This was caused by a voltage change applied to the take-up motor after starting to decrease the spooling tension. The effect is only really noticeable on a steady tone, and not on ordinary programme material. In any case it can be eliminated by assisting the take-up with one's finger for a second or two.

Altogether the Revox 736 is an excellent machine for its price, and I have yet to hear of a reviewer who did not wish to keep it for himself!

MANUFACTURER'S SPECIFICATION

Operating Voltage: 110 to 240 volts AC.
Power required: 120 watts.

Frequency response: 40-18,000 cycles at 7½ ips; 40-12,000 cycles at 3¼ ips (+2/-3 dB).

Signal-to-noise ratio: 55dB (two-track), 52 dB (four-track).

Amplifier inputs (per channel): Microphone (3 mV at 0.5 megohm); Radio (50 mV at 1 megohm); and Diode (3 mV at 47 K ohms).

Amplifier outputs: Cathode follower—5 K ohms, 0.7 V; Monitor amplifier—5 ohms, 6 watts.

Valve complement: four ECC 81, one ECC 82, five ECC 83, and two ECL 86.

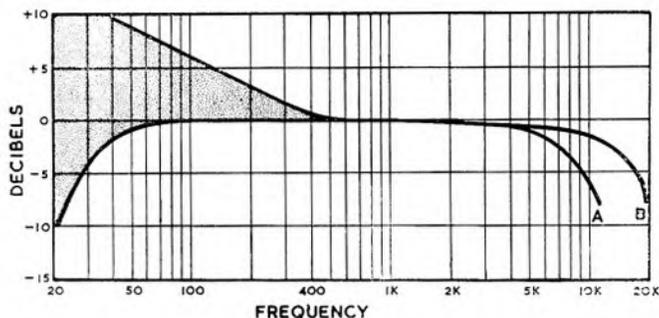
Bias frequency: 70 kc/s.

Dimensions: 18 x 13½ x 12 inches.

Price: 124 guineas (119 guineas chassis only).

Slide-o-matic: 17 guineas.

U.K. Agents: C. E. Hammond & Co. Ltd., 90, High Street, Eton, Windsor, Berks.



Overall record/replay frequency response of Revox Model 736 recorder. Curve A = 3¼ ips, curve B = 7½ ips. Shaded area indicates bass lift available in monitoring amplifier only

CORRECTION

We offer our apologies for further confusion regarding the price of the Telefunken M96 reviewed in our March issue. The current price of this machine is 79 guineas.

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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.

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TRM-I

John Borwick asks:

DO you use your tape recorder as a Public Address amplifier?

Attending the Association of Public Address Engineers Exhibition on March 17-18, I found myself wondering how many owners of tape recorders make use of the P.A. (Public Address) facility on their machines. In theory at least, most tape machines constitute a miniature P.A. or sound reinforcement system.

You have all the essentials there—a microphone, an amplifier and a loudspeaker. With no more gear, and without necessarily recording at the same time, you can amplify announcements, speeches or musical programmes such as a folk singer with guitar accompaniment and make them loud enough for quite a sizeable audience. Subject to your having obtained the necessary licence for public reproduction, you can of course plug in a gramophone unit and intersperse disc music—or some of your own tape recordings—with the microphone signal.

The bugbear, as with all Public Address work, is the ever-present risk of sound feeding back from the loudspeaker to the microphone and so producing the annoying whistles we call howl-round. This arises whenever the volume is turned up far enough to cause instability and the cure is to keep the microphone far away from the loudspeaker. Using an extension loudspeaker is helpful, instead of the one built into the recorder. It also helps if you can use a microphone with a nice long lead—say fifty feet or so. Tape recorders with low impedance microphone inputs take most kindly to leads of this length or even longer. But if your machine has only a high impedance input, you may find that extending the lead on the high impedance microphone causes too great a loss in signal strength. However, you can use a low impedance microphone into a high impedance socket if you incorporate a step-up transformer, such as the Ferrograph TA/30/GL, at the tape recorder end of the long lead.

A factor which greatly improves the use of a recorder for this "straight through" amplification of sounds is the increasing tendency for directional types of microphone to be supplied. A cardioid (usually moving coil) or a figure-of-eight (usually ribbon) microphone can be angled in such a way that the sound from the loudspeaker arrives in the dead area. You can then use higher sound volumes before the critical "howl-round" feedback condition is reached. I hope readers will try and get in a little practice on this idea of sound reinforcement, and so add to the versatility of their tape recorders. As with all amateur recording activities, however, there should be no attempt made to oust the professional. Recording and P.A. jobs involving large assemblies or the payment of fees are still the province of the expert. We have much

to learn from the professional, and it would be a pity to prejudice his source of livelihood by taking on (and possibly messing up) work which should have been given to a local specialist.

The Public Address Exhibition I mentioned at the beginning was the 16th of these annual events, and was made special by the fact that it is just 50 years (a Golden Jubilee) since the "Father of the Loudspeaker," Peter Jensen, undertook the first P.A. job ever in 1915. The proceedings at the Exhibition included a special two-way broadcast with a panel in New York and many of the forty exhibiting firms were well known in tape recording circles. These included Pamphonic, Goodmans, Reslosound, Shure, Vitavox, S.T.C., E.M.I., Lustraphone, Vortexion, Film Industries, Gramplan, A.K.G., Rola Celestion, Clarke & Smith, Philips, "Scotch," Whiteley, Fi-Cord and Decca.

TRUVOX GO TRANSISTOR

A SMALL party of technical journalists were recently invited to tour the Truvox factory at Neasden and see a demonstration of the new range of all-transistor tape recorders hurriedly being prepared for launching at the Audio Festival and Fair.

We saw the whole construction, assembly and testing of the Truvox equipment, which takes place in a large rectangular work area with the usual sound-proofed booths for quality listening tests. Machining of metal parts is done on the spot (there is even a sixty-ton press for stamping out panels) and a particularly impressive operation was the method used, said to be exclusive to Truvox, for giving a rough finish to the outside face of the flywheels. For this, molybdenum wire was liquified by rapid heating and sprayed on to the spinning flywheel. The resultant face is pitted with the sprayed metal, and provides a positive, non-slip grip for the connecting rubber idler wheel thereby giving reliable running and greatly increased life of the idler.

A double chassis method of construction is used, so that the top plate and motor plate assembly proceeds side-by-side down a single production line. The two plates are married at the end of this line and the printed boards, etc., are finally added and put on "soak" test for several hours. Wow and flutter are tested at three separate stages on every recorder—as a deck, a completed chassis and a boxed machine ready for final packing.

The star attraction on our visit was the new Series 100. We already knew the TSA 100 transistorised stereo high fidelity amplifier and the LS100 loudspeaker (introduced at last year's Audio Fair), but were seeing for the first time the Series 100 tape machines—the R102 and R104 two and four track mono recorders with five watts output, and the PD102 and PD104 two and four-track stereo, plinth-mounted tape units with 1 volt emitter follower hi-fi outputs.

Mechanically these new recorders closely resemble the Truvox Series 90, but the changeover to transistors has enabled more complex circuitry to be incorporated giving, for example, a very efficient form of comprehensive check between the incoming signal and the signal recorded on the tape. Unlike the usual system, a dead flat comparison is made available, an extra amplifier being included together with a ganged potentiometer so that the input and playback head signals are presented to the monitor circuit



Very accurate VU meters are fitted to the entire Truvox range. The monitor switch (bottom) provides instant flat response comparison between source and tape signal

at exactly the same volume and equalised condition. Thus, when we were invited to try out the machine, we were really comparing the input and off-tape quality and in my case, at least at 7½ ips it became very difficult to detect any difference.

The other features of the Series 100 will no doubt be enumerated in a future review in these pages, and in the meantime it is certain that this new range of recorders, in association with the Truvox amplifiers and loudspeakers will make a display well worthy of close study by tape recording and hi-fi enthusiasts at this year's Audio Fair.

TAPE AND CINE

(Continued from page 191)

microphone has to be on a boom suspended just out of frame over the actors' heads, or else the speakers must wear chest microphones concealed in their clothing. The latter is a useful technique where the speaker does not move about, but you will need a microphone that has provision for bass cut.

Post-recording: This requires a good deal of skill, but it can be done. Professionals post-record almost all their location dialogue, and several successful amateur sound films with lip-sync dialogue have been produced in the same way.

The basic technique is as follows. First of all, the film to be dubbed is broken down into sections, each of, say, a minute's duration, and these are made up into loops. Matching loops of tape or magnetic film are also prepared, and start marks are made on all the loops.

The first pair of loops are then threaded up on the projector and recorder, the two machines being coupled with a synchroniser. The loops are then set going, and the actors speak their lines in time with their lip movements as projected on the screen. When the loops have been round once, the recorder is switched to playback, and the recording checked against the projected picture. If it is not satisfactory, the "Record" switch is pressed again, and another recording is made on the next run of the loop. This alternate recording and playback continues until a satisfactory recording is achieved. Then the next loop is treated in the same way. Allowing for rehearsals, it may take as long as an hour or more to get each loop perfectly recorded.

When all the loops have been recorded, the film is re-assembled and the recordings joined together to match. The master recording is now dubbed on to the striped picture, transferred to optical, or whatever is appropriate.

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NEW PRODUCTS

**TRANSISTOR
RANGE
FROM TRUVOX**

BRITAIN'S first ever all-transistor range of quality tape recorders is announced by Truvox Ltd.

Four models are included in the range to be introduced at the Audio Fair. These are the R102 (illustrated below) and R104, two- and four-track versions of a three-speed mono recorder, and PD102 (illustrated right) and PD104, two- and four-track versions of a three-speed stereo tape unit. The respective prices are 76, 79, 93 and 89 guineas.

The new Series 100 units incorporate the latest version of the Truvox three-motor tape deck, using each motor for an individual function with two powerful high speed wind motors and a heavy flywheel driven at $7\frac{1}{2}$, $3\frac{1}{4}$ and $1\frac{1}{2}$ ips.

The quoted frequency response obtainable from all four units is 30-17,000 cps \pm 2 dB at $7\frac{1}{2}$ ips, 40-10,000 cps \pm 2 dB at $3\frac{1}{4}$ ips, and 60-8,000 cps \pm 3 dB at $1\frac{1}{2}$ ips. Respective wow and flutter figures are given as better than 0.1, 0.15, and 0.25 per cent.

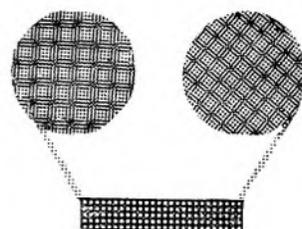


Signal-to-noise ratio is quoted as better than -50 dB.

Seven-inch spools can be accommodated, providing a playing time of 64 minutes per track, using standard-play tape (1,200 ft.) at $3\frac{1}{4}$ ips. Rewind is achieved within sixty seconds.

One of the most interesting features of the Series 100 is instantaneous comparison of original signal and actual sound recorded on the tape provided by incorporating separate record and replay heads and amplifiers. Other features include VU meter recording level indicators, pause control, facilities for mixing, self-zeroing four-digit rev. counter, automatic tape end stop facilities, built-in splicing flap, piano-key controls, and spool hubs for silent tape transport. The stereo model also incorporates facilities for sound-on-sound recording and re-recording.

Truvox decided to use transistors in the new series because of their reliability under all operating conditions, and their ability to work directly into low impedance loads eliminating problems of impedance matching and output transformer inefficiency. The size and weight of transistors enable much more complex circuitry to be used in a relatively small space without heat and ventilation problems.



The recorders incorporate built-in 8 x 5 inch elliptical loudspeaker units handling the five watt power output. The two PD tape units include one volt emitter follower output sockets.

The recorder measures 16 x 16 $\frac{1}{2}$ x 8 inches, and weighs 34 lb. The tape unit weighs 28 lb.

Truvox Limited, Neasden Lane, London, N.W.10.

**BATTERY/MAINS
MODEL
BY LOEWE-OPTA**

A NEW battery and mains operated transistorised tape recorder is announced by Highgate Acoustics, U.K. agents for the German Loewe-Opta equipment.

The new machine, illustrated below, is the Optacord 416, a two-speed, half-track recorder selling at 51 guineas.

Quoted frequency response is 50-12,000 cps \pm 5 dB at $3\frac{1}{4}$ ips, and 90-6,000 cps \pm 5 dB at $1\frac{1}{2}$ ips. Wow and flutter is given as within 0.3 and 0.5 per cent respectively, and distortion factor as five per cent at full output.



It will accommodate 4½-inch reels, providing a playing time of 60 minutes per track using triple-play tape (1,200 ft.) at the higher speed. Rewind is achieved within two minutes.

The features include facilities for remote control, three-figure digital rev. counter, combined recording level and battery life indicator, pause control, recording safety lock, a 5-ohm extension loudspeaker socket, and push-button controls for record, replay, stop, forward, and rewind.

Inputs are provided for microphone (0.5 mV into 5 K ohms) and radio (0.5 mV into 50 K ohms); and an extension amplifier socket (500 mV into 10 ohms). A built-in permanent magnet 6 x 4 inch elliptical speaker handles the power output of 1.5 watts.

The Optacord 416 can be operated from power supplied by five 1½ volt U2 batteries, or equivalent; or from AC mains—110/220/240 volts, AC, 40-60 cycles. Maximum power consumption is rated at seven watts.

The recorder's dimensions are 15½ x 4½ x 9½ inches, and it weighs 8 lb. Accessories included in the price include microphone, recording lead, reel of tape and empty spool.

Highgate Acoustics, 71-73, Great Portland Street, London, W.1.

S. G. BROWN ANNOUNCE NEW MINIATURE HEADSET

A MICRO-MINIATURE headset, similar to that used in the Mercury space capsule, was recently introduced by S. G. Brown Ltd.

The new headset, illustrated in use below, comprises a small twin transducer unit containing a miniature magnetic microphone and receiver. The capsule slips on to the user's spectacles or on to an ultra-lightweight adjustable headband which is supplied.



Alternative methods of mounting will enable the unit to be anchored to a helmet or other headgear. A double earpiece assembly is available.

Weighing under one ounce, it is suitable for continuous wear, and compatible with all existing systems.

Speech is conducted to the microphone via an acoustic tube—highly efficient in attenuating sibilants and extraneous noise—which is attached to the twin transducer unit. The output from the receive is conducted to the ear via a small flexible plastic tube terminated by a moulded germicidal plastic tip. An alternative earpiece is anchored just outside the ear. Foot-operated switches leave both hands free. Price details are not yet available.

S. G. Brown Limited, King George's Avenue, Watford, Hertfordshire.

FI-CORD INTRODUCE THEIR LATEST RECORDER

FI-CORD INTERNATIONAL announce the introduction of the Fi-Cord 202A battery/mains operated tape recorder which replaces the three-year-old 202 machine.

New on this latest version is a battery testing system, a re-designed control panel, and a new VU recording level meter.

Battery checking is now achieved using the lower scale of the VU meter. With the model switched to "play," the tape switch inoperative, and the "test batteries" switch



depressed, the needle shows the motor battery condition. When on "record," the needle indicates the condition of the electronics batteries.

Normally powered by mercury batteries, the two-speed 202A can also be operated from a twelve-volt DC car battery, 105-240 volts AC mains, or rechargeable accumulators with the battery unit supplied.

Four-inch diameter reels provide a playing time of 48 minutes for each of its two tracks at 3½ ips. Frequency response is quoted as 50-12,000 cps ± 3 dB at 7½ ips.

With the introduction, Fi-Cord also announced their recent change of address. All departments are now in operation at the new address given below.

Fi-Cord International, Charlwoods Road, East Grinstead, Sussex.

RECOTAPE IMPORT AMERICAN TAPE RECORDS

A NEW range of American manufactured tape records totalling some 2,500 titles are announced by Recotape Recordings Ltd.

The new issues, including 18 from the Ampex range of recordings, will be available in two-track stereo and mono form. Twenty-five American labels will be issued. Full catalogues are currently being prepared.

Recotape also announce that their current range of five-inch reel tape records are to be issued on three-inch reels also. Prices will remain the same, as there will be no difference in the length of the recorded programme.

Items in the current catalogue which have proved too long for three-inch reels are being re-programmed in order to accommodate them on the smaller reels.

Third recent innovation from Recotape concerns their new-style catalogue. This is a tape containing excerpts from each of the numbers in the catalogue, supplied with an identifying commentary.

The new catalogues are available on loan only, and are obtained against a refundable deposit.

Recotape Recordings Limited, 10, Wells Avenue, Southend-on-Sea, Essex.

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Tape records reviewed

W.R.C. CLASSICS
**issue
an
historic
recording**
By Edward
Greenfield



BEETHOVEN. Symphony No. 9 "Choral"
Söderström, Resnik, Vickers, Ward,
London Bach Choir, London Symphony
Orchestra conducted by Pierre Monteux.
WRC (TT 415-6, two tapes) 3½
ips, mono. 29s. each.

It is quite a coup for World Records issuing this historic recording by Pierre Monteux, made not so long before he died. I remember an unforgettable performance with the London Symphony Orchestra which presumably was the one which prompted this recording with a fine array of soloists in the chorale finale. During the live performance Monteux at one point in the slow movement stopped beating time. For a frightening moment one took alarm, but then the old man in his late eighties rallied and brought the house down with the great choruses at the end.

As revealed on these tapes Monteux's approach to the work is as unidiosyncratic as you could ever get from a great conductor. Most of his speeds are perfectly chosen, and he never indulges in the romantic exaggeration beloved of conductors who like to impose their will on Beethoven. Monteux has none of it: he demands that you concentrate on the musical argument and not at all on the way it is being presented. Only in the finale do I feel that he could have brought more incisiveness to the music. There David Ward is too matter-of-fact in the great command to make music more joyfully, but at least he sings the passage exactly, which is more than most baritone soloists do. In this movement Monteux's speeds are on the relaxed side too which makes it difficult for players and singers alike to give their most electrifying form. All the same, there is an overall firmness which by the end has built the whole into the large-scale structure that one demands, and the very end is both hectic and thrilling.

On the fourth track (the second of the second tape) you have extracts from the rehearsals for the recorded performance. For the student of conducting Monteux's technique is fascinating, much more closely analytical than many would have inferred from Monteux's deceptively benign manner. For the non-student the voice itself will be astonishing. It is the voice of a young man, not of a man in his late eighties. Like most conductors he illustrates his points amply with sung examples, and again the voice is young, though in truth no more musical than the voices of his younger rivals. At the end in celebration he conducts a rousing performance of the "Marseillaise."

The recording is good (it was made by Westminster originally) but on the review copy there is a curious rapid fluctuation of volume in the slow movement that is probably not a general fault.

BEETHOVEN. Piano Concerto No. 4. Overtures "Ruins of Athens" and "Prometheus." Jacob Gimpel (piano), Berlin Symphony Orchestra conducted by Arthur Rother. WRC (TT 300) 3½ ips, mono. 29s.

Though not so difficult technically as Beethoven's Fifth Concerto "The Emperor," this Fourth Concerto is a most elusive work for any soloist, beginning as it does with a quiet piano entry that must sound as though the music had only just emerged into human hearing. Jacob Gimpel like many virtuosi before him does not quite achieve that magic, but when the piano enters in the conventional way later in the movement he seems completely at home. His is a fairly light-weight style, but by no means too light-weight, for this work in particular flourishes on a crisp, clean-fingered approach, and Gimpel never reduces the music to merely Mozartian prettiness. The brief slow movement, a dialogue between piano and orchestra, is taken very slowly with Gimpel bringing out the thoughtfulness of this hushed music. Unfortunately the orchestra is comparatively flabby, and in the other movements too its contribution hardly matches that of the soloist.

All the same this is a welcome tape-issue as there is no rival version on tape, Arrau's expensive Columbia issue (lumberingly performed) having disappeared from the catalogue last year. The recording, made in Germany by Ariola, favours the piano at the expense of the orchestra. On the review copy there were a couple of examples of intermittent "wow" near the beginning of the second track, particularly intrusive in piano recording. The two brief overtures in their brisk way make a good makeweight.

Memphis

JAZZ

**Slim
takes
a**



gamble

By Mike
J. Gale

MEMPHIS SLIM. WRC (TT 394) 3½ ips, mono. 29s.

Memphis Slim (real name Peter Chatman) was born in Memphis, Tennessee, on September 15, 1915 into a musical family and by the age of 16 he was earning his living as a pianist and vocalist. A few years later he moved to Chicago where he spent the best part of twenty years before being attracted to the European circuits and Paris in particular.

This album is the result of a session held in Paris in July 1961 during the earlier stage of his European phase and perhaps with the enthusiasm of experiment induced by a new environment, he tackled the hardest possible project. Twelve items performed without sidemen is a gamble even with subtle programming and varied material but Memphis Slim is also a great vocalist and he unwisely drops it this time.

In fact the programming is poor and the material depressingly similar while his crippling self-restraint quickly kills any

surge of interest. It is inexpressibly dull. In *Bluesnik*, for example, he submerges himself in paludal indifference and unoriginality yet occasionally *The Hustler* breaks into something approaching his imaginative style.

Every great jazzman is allowed his failures and experiment is the lifeblood of a great jazzman. Memphis Slim belongs in this category but this time he set himself an impossible task.

The remaining items are *Carried Away*, *Panic Street*, *Back Home*, *Olympia Boogie*, *Sonophone Boogie*, *Blue Slim*, *Musing*, *West Side Trot* and *Hofjan's Delight*.

DAVE BRUBECK. Crown (ST 157) 7½ ips, four-track stereo. 55s.

Jazz falls conveniently into a recognised evolutionary cycle with the most recent major development producing a sophisticated and thriving trend known as the West Coast Movement. One of its main disciples and certainly its most successful is Dave Brubeck.

Brubeck was born in California 45 years ago and with the encouragement of his mother, herself a skilled pianist, he started playing at the age of four. By the time he reached his teens all his spare time was spent playing professionally with an assortment of outfits including exponents of Dixieland and Swing. At this stage in his life, the familiar pattern in the development of jazz giants ended, for Brubeck went on to study classical music at Mills College under Darius Milhaud emerging with a M.A. degree and a job teaching at the University of California. At the same time he formed a chamber jazz group and began to develop a jazz style of improvisations based on European classical music.

The formula and correct combination did not come at once by a sudden flash of inspiration but instead grew slowly and firmly established itself so that by 1958 the State Department sponsored an African and Asian tour. Later, of course, a shortened version of *Take Five* went into the "Pop" charts.

Brubeck is held suspect by many and frequently accused of commercialism but without question he does not contrive it in the Dorsey manner and the success of *Take Five* was due in large part to the unflinching plugging techniques used by record companies.

Leaving aside the question of economics (£2 15s. for about 26 minutes of playing time) this album is a superb example of what West Coast jazz really is. Melodic improvisations flow effortlessly and there are at least a dozen phrases which form an integral part of the whole yet stand up brilliantly when considered individually. Brubeck is fantastically good (as indeed they all are) one moment introspective with chords searching neurotically for a way and then subtle harmonies lead into creative fulfilment.

His sidemen contribute greatly to his inspired performances especially with *At a Perfume Counter* which takes up one half of the album yet leaves one gasping for more.

The other items are *Purple Moon* and *Jazz Lating* both collector's gems. A word about the stereophonic reproduction: perfect.

SONG OF THE WANDERER. Personnel: "Kid" Ory, trombone; Darnell Howard, clarinet; Marty Marsala, trumpet; Cedric Haywood, piano; Frank Haggerty, guitar; Earl Watkins, drums. WRC (TT 389) 3½ ips, mono. 29s.

Edward "Kid" Ory was born in Laplace, Louisiana on Christmas day 1886 and until last year he was still playing regularly. With

such a span it is not surprising that he once employed a boy named Louis Armstrong or that he worked with giants like Buddy Bolden in the Storyville days in New Orleans. By 1920 he was in California where he remained for five years until he joined "King" Oliver's Dixie Syncopators in Chicago. Until the Depression he recorded regularly with Oliver, Armstrong, the Dodds Brothers and as one of Jelly Roll Morton's Red Hot Peppers.

The Wall Street crash forced Ory to give up playing professionally and he turned to raising prize chickens. During the War Orson Welles invited Ory, now a successful businessman and a noted horticulturalist, to form a New Orleans type jazz band for his CBS radio show. It was an immediate success and later, he and his band were featured in the Hollywood production "Crossfire" and some of his group, including Ory, appeared in the feature film "New Orleans."

When Ory was nearly 78 the magazine "Gramophone" emphasised that he was the oldest living jazzman still playing and the resulting publicity created new public interest.

This set is far below the standard of his best work recorded in the early 'fifties. Ory's tone varies a good deal from the classic brassy sound to a fog-horn growl and if, at times, the playing is not up to the standard expected, the feeling is. He rejects any subtlety and plays in a loose and occasionally vulgar way exaggerating the melody line and allowing, unlike his earlier work, unnecessary racing by the rhythm section.

The outfit are full-blooded on some tracks like *St. Louis Blues* but the *Sheik of Araby* is almost a caricature. By far the most disappointing feature is Darnell Howard who, at this session anyway, seems extremely limited particularly when compared to the great Omer Simeon.

The set also covers *Song of the Wanderer*, *Tailgate Ramble*, *Mahogany Hall Stomp*, *Baby*, *Won't you please come Home*, *Too Toot Tootsie!*, *Tiger Rag*.

The tapes reviewed this month are issued by the following companies:
 "Crown," Teletape Ltd., 33, Edgware Road, Marble Arch, London, W.2.
 "WRC": World Record Club, Box 11, Parkbridge House, The Little Green, Richmond, Surrey.

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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.

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Hi-Fi for the Music Lover by Edward Greenfield.

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

33. You and Your Tape Recorder by Norman Paul (1962). 4s.
By a past winner of the British Amateur Tape Recording Contest.

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.

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.

10. High Fidelity Pocket Book by W. E. Pannett. 304 pages. 40s.

36. The Grundig Book by Frederick Purves. (Tenth edition). 217 pages. 15s. 6d.

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

Catalogue numbers may be used when ordering.

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.

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.

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.

35. Tape Recording Yearbook 1965. 7s. 6d.

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

39. Tape Recorder Manual by Wallace Sharps. (New cheap edition). 10s. 6d.

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News from the Clubs

BATH

A live recording session was organised for the Bath members at the last of their March meetings, when the Avonmouth beat group "The Dipples" visited the club. "The Dipples" visited the club. The group played until midnight, providing ample opportunity for live music recording. Extracts from the tapes made will be included in "Club Time," the society's hospital broadcast programme.

Earlier in the month, members had produced the first of these new feature programmes. Talks, news, reviews, and musical items are to be included in all future issues, which are to be circulated to the local hospitals. Members are currently occupied indexing the records they have donated to Bath Hospitals Broadcasting Society.

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

BIRMINGHAM

The Birmingham club recently took delivery of a stereo transistorised amplifier. This led to a hectic evening during March trying out all the plugs, holes, and wires in sight. The unit received a thorough testing, and seems to have satisfied even those members not too happy about transistorised circuits.

Later in the month, several members presented a tape/slide show to an audience over a hundred strong, at a local church. The show concerned a trip to Switzerland, and included tape commentary including sound effects recorded during the journey. A home-made synchroniser, working from impulses on the lower track of a stereo recorder, changed the slides at the right time, every time!

A week later, Brian Skinner and his wife Barbara followed a humorous programme on tape with one of their popular quizzes.

Among other recent activities of the club was a visit to the Coventry club, where they joined the Warwickshire members in celebrating their eighth birthday. They enjoyed a hilarious evening and despite teams running in all directions, balloon-fighting, and similar hectic games, at least one member from Birmingham (in true tradition) interviewed most of the guests on his new portable.

Another recent visit concerned the first dinner of the Midlands Association of tape clubs. Held in Birmingham's Imperial Hotel on March 26, this attracted representatives from various clubs throughout the area. Special guest was Mr. R. R. Arthur who spoke about his work with the BBC. After the dinner, John Leedham played the Vibraphone accompanied by his wife at the piano. Needless to say a few microphones suddenly appeared.

The club's AGM was held on April 5. All, save one member of the committee, were re-elected for a further year in office.

Secretary: Mrs. Dawn Knee, 23, Holly Lane, Birmingham 24, Warwickshire.

BOURNEMOUTH

Recent news from the long unheard of Bournemouth tape club necessitates a change in the list of secretaries addresses. The office down there is now filled by Miss Doreen Slack who writes to say visitors and prospective members are welcome to the society's fortnightly meetings.

Meetings are being held on alternate Tuesday evenings at the Pembroke Hotel, Poole Hill, at 8 p.m.

Secretary: Miss Doreen Slack, Studio One, 18, Kingswell Road, Emsbury Park, Winton, Bournemouth.

BRIGHTON

A detailed examination of the battery portable recorders owned by members was the main item on a recent meeting of the Brighton tape club. Each machine was demonstrated for the benefit of those members with only mains recorders, to assist them formulate an opinion on the various models.

For the second March meeting, members were invited to play their favourite musical item on record or tape, for eventual discussion on merit. This was followed by a demonstration of his Sophony Baird tape recorder by Mr. Draper. This full-track machine was one of the first commercial machines made for the domestic market, and is at least twenty years old. The restricted frequency response is said to resemble a telephone, and it incorporates a "crude" head having the dimensions of a box of matches.

This particular evening finished with a few more records played on equipment taken along by Mr. Guile.

A particular invitation is made for prospective members who are invited to visit the club any Wednesday at the Downs School, Grantham Road, Brighton.

Secretary: Keith Upton, 47, Kingsley Road, Brighton, Sussex.

CAMBRIDGE

A change of venue is announced for the Cambridge tape club, which now meets every Wednesday at the East Barnwell Community Centre, Newmarket Road, Cambridge.

Secretary: H. K. Rout, 18, Fendon Road, Cambridge, Cambridgeshire.

DARTFORD

In an effort to obtain live recordings for the Catford society's feature tape "Inter-Club," members of the Dartford society recently went out in the most appalling weather conditions to a house in which was installed a Jennings electronic church organ. Traipsing across snow-covered Dartford Heath with a temperature below freezing level, they arrived to find that a power cut was in danger of preventing a recording session. However, with the help of local organist Mr. Lintell they eventually managed to operate the organ.

The new Revox (reviewed this month) was used with an STC ball and biscuit microphone by Mr. A. G. Wood; while chairman Mr. G. A. Pulham operated his home-built recorder with a Brenell deck and Film Industries ribbon microphone.

At a meeting a week later the tapes were played back, an item selected, and sent off for "Inter-Club." Further location programmes are now being planned.

The club's membership is reported to be on the increase, due mainly to

sterling work on the part of member Mr. Green who designed show cards for distribution to dealers and libraries.

Secretary: E. H. Foreman, 117, Westgate Road, Dartford, Kent.

DUNSTABLE

News of a new club to be formed for enthusiasts in the South Bedfordshire area. Initial plans by the present holding committee include arranging programmes for the aged and hospitalised, which will include recording church services for those unable to attend personally.

Situated close to the M1 Motorway, the club members realised that many of the accidents involve travellers from various parts of the country. The members hope to enlist the assistance of other clubs to co-operate by relaying messages from patients to friends and relations.

One of the local dealers has offered to advertise the existence of the club, and the members also seek contact with clubs and enthusiasts overseas.

Secretary: G. Farnham, 24, Drovers Way, Dunstable, Bedfordshire.

ESPERANTO

Since his letter appeared in our March correspondence column, Mr. G. Stephenson has received numerous inquiries from both home and overseas regarding a club of Esperantists.

As a result the British Esperanto Tape Friends society has been formed on a tape exchange basis. Not restricted to Esperantists, the club follows the usual pattern of international exchange societies, but with the initial advantage of having a universal language as the basis for its existence.

Secretary: G. Stephenson, "Hazelwood," Langshott, Horley, Surrey.

FRIERN BARNET

At the recent AGM of the Friern Barnet tape club, Tony Andrews relinquished his post as secretary. The vacancy was filled by Stephen Robinson.

Among recent ventures of the members was a visit by the nearby club at North London. Their twice monthly meetings are continuing to attract members with such activities as location recording and the occasional constructional work.

Secretary: Stephen P. Robinson, Flat 3, 11, Woodside Avenue, London, N.12.

GLASGOW

The Glasgow club's first attempt at stereo recording was recently organised. An "Any Questions" programme was chosen as the most suitable initial step, and on playback the results appear to have been most pleasing.

During the evening, John Anderson gave a talk and demonstration of "Hi-fi through the Ages," covering the period from 1898. Next, chairman John Wood played the first of a series of programmes he is making called "The story that never ends"—a review of the club's activities since its formation. He was followed by John and Peter Douglas who presented a demonstration of how to obtain echo effects from a recorder. The full programme for the night was concluded by John Knowles who demonstrated recording using 8mm. film on his new sound projector.

Activities outside the club rooms have been just as busy. On a recent Sunday, members visited Renfrew Airport to record the comings and goings of the commercial airliners. From there they visited another nearby airport, this time to record the sounds of radio controlled model aircraft. Continuing their Sunday excursion, they visited a motorcycle scramble meeting. A full day's recording taking into account also the tapes made on the Renfrew Ferry crossings.

A great deal of publicity is currently surrounding the "Maid of the Loch," a paddle steamer plying her trade making pleasure cruises around Loch

Lomond. The steamer has been losing money, and unless a profit is shown this summer will be withdrawn from service. Foreseeing the possibilities the Glaswegian members propose a trip on the "Maid" before the chance to record the gentle thudding of her engines is lost forever.

Secretary: J. A. Douglas, 113, Novar Drive, Hyndland, Glasgow W.3, Scotland.

GLOBAL TAPE EXCHANGES

News of yet another international tape exchange club is received from Roy Patrick, U.K. representative of the Global Tape Recording Exchange Club. The headquarters for GTRE are centred in Wayne, New Jersey. Among their activities are picture postcard shows, accompanied by taped commentaries; round robins, and a special round robin for members interested in short-wave radio.

U.K. Representative: Roy Patrick, 8, Sidney Street, Derby, Derbyshire.

GUERNSEY

The second tape society to be formed in the Channel Islands is announced with the news from Mr. O. Le Vallee that he proposes to start a club on Guernsey, second largest of the islands.

Interested persons are invited to contact Mr. Le Vallee direct. He would also like to hear from the established clubs who can offer advice on suitable programmes for the members.

Secretary: O. Le Vallee, "Janstars," Les Amballes, St. Johns, St. Peter Port, Guernsey, Channel Islands.

STOCKTON

Another new club announced this month is that formed in Stockton-on-Tees. The instigator is J. Flint who has already secured the use of rooms at the Elmwood Community Centre.

A useful start to the club is promised with the possibility of grants being issued for equipment, and the availability of a cine sound projector and slide projector.

Secretary: J. Flint, 45, Millford Road, Norton, Stockton-on-Tees, Co. Durham.

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 208 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.

Burnett, Robert E. (37). 45, Jewel Road, Walthamstow, London, E.17. Esperanto, philosophy, books, music. 7½, 3½, 1½ ips. Seven-inch spool. Brenell Mk 5 Series 2. Male contacts only in UK.

Brudenell, Peter I. (23). 36, Trevor Road, Southsea, Hampshire. Travel, cinema, pop music. 7½, 3½, 1½ ips. Seven-inch spool. Philips EL3542, four-track. Female contacts only in UK, France, USA. Letters first please.

Clark, Brian L. (31). 15, Hayton Grove, North Road, Hull, Yorkshire. Languages. 3½, 1½ ips. Seven-inch spool. Stella ST458. Female contacts preferred in Germany, Sweden, France, Spain, Russia.

Collier, Richard C. (33). 44, Cronage Road, Fulham, London, S.W.6. Photography, humour, golf, hi-fi music. 3½, 1½ ips. 5½-inch spool. Telefunken 76K. Female contacts only.

Collins, Brian (28). 215, North End Road, London, W.14. Humour recording, reading, theatre, music. 7½, 3½, 1½ ips. Seven-inch spool. Grundig TK40, four-track.

(Continued on page 208)

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TAPE EXCHANGES

(Continued from page 207)

Arnold, Richard (30). 24, Cawdor Crescent, Hanwell, London, W.7. Short-wave radio, old time jazz, c/w and folk music. 15, 7½, 3½ ips. Seven-inch spool. Wyndors recorder. Male contacts only.

Bartlett, Anthony (25). 52, Devon Road, Watford, Hertfordshire. 8mm cine photography. 7½, 3½, 1½ ips. Seven-inch spool. Wyndors Victor and Benksom 600. Holland, USA (Watford City).

Barton, Douglas (43). 39, Taybridge Road, London, S.W.11. Travel, Continental films and LP's. 7½, 3½, 1½ ips. Seven-inch spool. National recorder. Europe, USA, South America.

Biermann, Lothar (22). 49, Whitehall Park, London, N.19. German, Italian, Dutch languages, and jazz music. 7½, 3½, 1½ ips. Five-inch spool. Uher 4000 Report-S. Continent, America.

Bird, David (25). Radac House, 92, Gardiner Street, Gillingham, Kent. Photography, electronic organs, music. 3½ ips. Seven-inch spool. Philips EL3514/15B and Unicorder portable. Contemporary male contacts in England (Kent) and Germany.

FAMILY EXCHANGES

Bowers, Mr. and Mrs. D. (43/45). 95, Grenfell Avenue, Saltash, Cornwall. Photography, short-wave radio, Italian language. 3½ ips. 5½-inch spool. Grundig TK20. UK, USA, Europe.

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)

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Jones, Mr. and Mrs. D. E. (35/26). 31, Swallow Dale, Kingswood, Basildon, Essex. 8mm and 35mm photography, geography, art, economics. 7½, 3½, 1½ ips. Seven-inch spool. Robuk RK44. Europe, Australasia, The Americas.

OVERSEAS READERS

Adam, Neil J. (?). Weerona Staff House, Macquarie Street, Woongong, New South Wales, Australia. 35mm photography, coins and rock collecting, all music except jazz and folk. 15, 7½, 3½, 1½, 15/16 ips. Seven-inch spool. Akai Model 44, four-track stereo.

Craig, Mitch (24). PO Box 147, Orange Grove, Johannesburg, South Africa. All music. 1½ ips. Special cartridge with Philips EL3300 battery portable.

Dame, Neil (32). 4332, Palmer Avenue, Jacksonville, Florida, USA. Unusual sounds, music. 7½, 3½, 1½ ips. Seven-inch spool. Philips and Ampex recorders.

Foster, George Iveson (30). 38, Given Street, Havelock North, Hawkes Bay, New Zealand. Amateur dramatic and operatics, travel, maori culture, classical music, and Gilbert and Sullivan. 3½ ips. 5½-inch spool. Dreco Tempo recorder.

Jibril, Tunde (32). C/o Shellhouse, PMB 2052, Lagos, Nigeria. Electronics, discs. 7½, 3½, 1½ ips. Seven-inch spool. National 703. Australia, America, Europe.

Tarino, Giuliano (21). Via Tripoli 41, Biella, Italy. Travel, politics, music. 3½, 1½, 15/16 ips. Five-inch spool. Elpico Geloso 258. UK, esp. London. Letters first please.

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INDEX TO ADVERTISERS

A. Brown & Sons Ltd.	194
Adastra Electronics Ltd.	198
Agfa Ltd.	Back cover
BASF (Chemicals) Ltd.	170
Bang & Olufsen U.K. Sales Division	171
Berean Forward Movement	213
C. Braddock Ltd.	198
Brenell Engineering Co. Ltd.	174
City and Essex Tape Recorder Centres	176 and 204
Cussins & Light Ltd.	202
Daystrom Ltd.	212
Educational Recordings Ltd.	213
Elstone Electronics Ltd.	209
Fairbotham & Co. Ltd.	205
Fi-Cord International	179
Francis of Streatham	206
Global Products	213
Grampian Reproducers Ltd.	194
Grundig (Great Britain) Ltd.	180
Howard Tape Recorders	211
Ilford Ltd.	172 and 173
Kodak Ltd.	210
K.J. Enterprises	196
Lee Electronics	203
Lustraphone Ltd.	196
Magnegraph	203
Mallory Batteries Ltd.	215
Massey's Centre of Sound	204
Mastertape (Magnetics) Ltd.	190
Multicore Solders Ltd.	196
Rapid Recording Service	197
Recording Machines Ltd.	203 and 205
Reslosound Ltd.	175
R.E.W. (Earlsfield) Ltd.	181
Sheen Tape Recorder Centre Ltd.	204
Tape Recorders (Bournemouth) Ltd.	202
Tape Recorder Centre (Blackpool)	202
Tape Recorder Centre (Halifax)	203
Tel-Lee-Radio	204
The Ferrograph Co. Ltd.	200
"The Recorder and Music Magazine"	196
The Recorder Co.	212
Tom Molland Ltd.	205
Truvox Ltd.	178
Tysonic	205
United Technical Supplies Ltd.	213
Wharfedale Wireless Works Ltd.	177
Worthing Tape Recorder Centre	202

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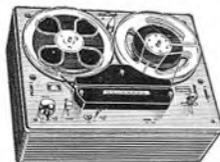


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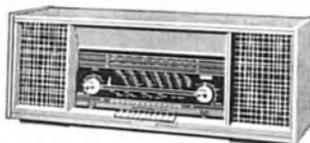
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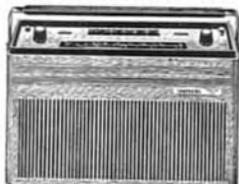
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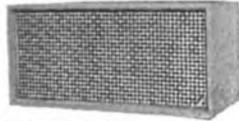
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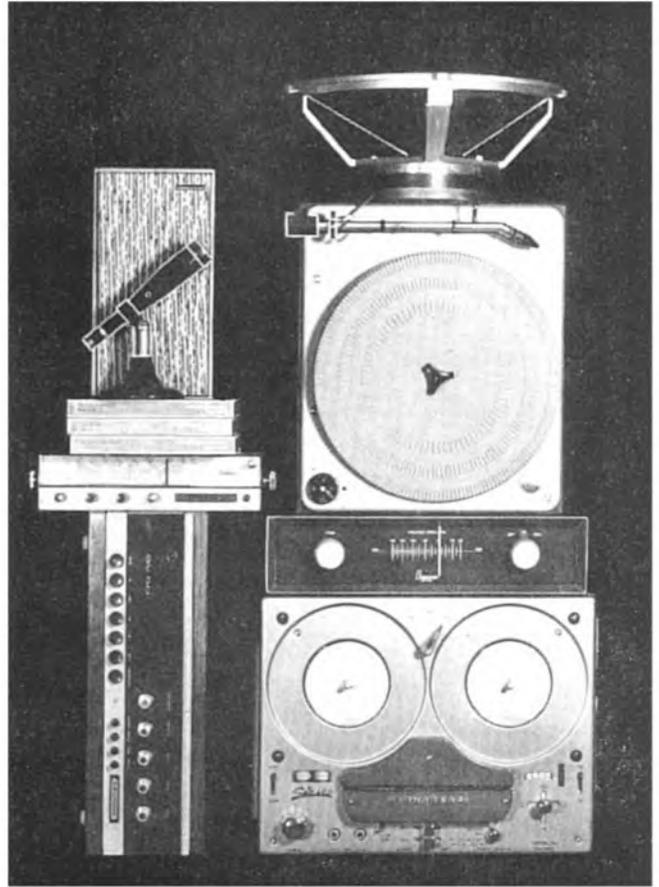
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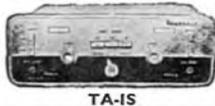
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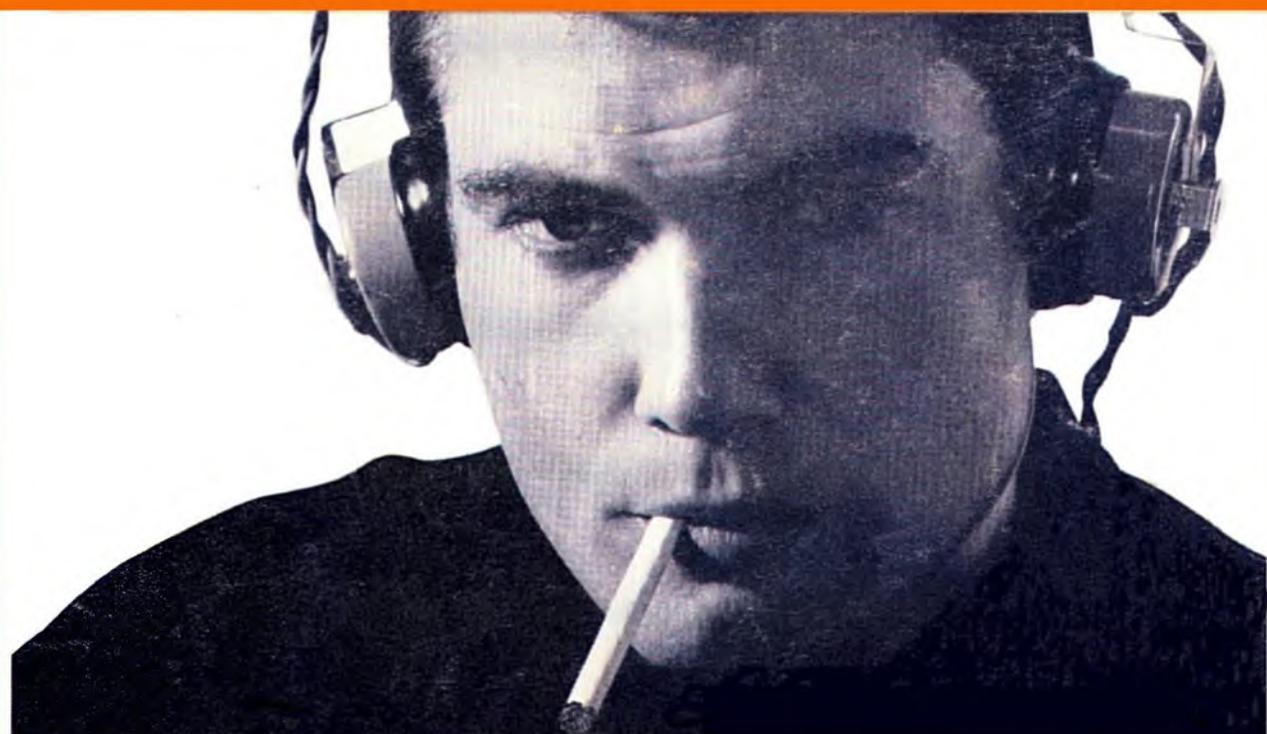
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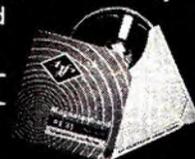
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