

APRIL 1967

TAPE

RECORDING MAGAZINE

2¹/₂

SPECIAL AUDIO FAIR NUMBER

All the News Including
WHAT TO SEE
WHAT TO HEAR
HOW TO JUDGE

**COMPLETE PREVIEW
OF ALL EXHIBITS**

ALSO — TEST BENCH,
RECORD REVIEWS, ETC.

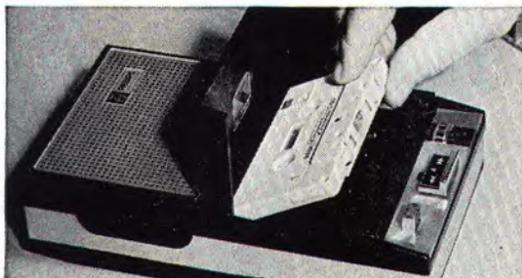
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on your mark



get set



Go!



The BASF Compact Cassette. Off to an instant start!

Now . . . BASF quality tape in cassettes for the Philips system. Quick and neat . . . slip it in and turn it on. No threading, no tangle, no bother. Keep a tape library of your favourite music . . . change the cassette to fit your mood. Handy for taking notes, recording speeches

. . . easy to label and organise. Click-in convenience with BASF quality. The Compact Cassette.

*The C60 . . . 30 minutes on each track . . . 19/6d.
The C90 . . . 45 minutes on each track . . . 27/6d.*

BASF United Kingdom Limited, 5a Gillespie Road, London, N.5. Telephone: Canonbury 2011.



Over 100 different Tape Recorders and Hi-Fi equipments: ONLY ONE IS RIGHT FOR YOU

THEY'RE ALL HERE every kind of Tape Recorder on the market. Nowhere else can you see such an all-embracing display as that which awaits you at NuSound.

As Britain's largest Tape Recorder sales organisation with over 10 years' experience in this specialised field, NuSound have built up a reputation that is "second to none."

Only from NuSound can you obtain the benefits of all these invaluable features—The most comprehensive range of equipment on display in the country, expert staff, free technical advice, immediate demonstration of any model, the finest after-sales servicing available.

Whatever your means of transport or point of arrival, be it Holborn, King's Cross or Liverpool Street Stations there is a NuSound showroom within easy reach. The position of each showroom has been carefully selected to be just a few minutes away from well known Central London landmarks and Main Line Stations.

- UNBEATABLE NO-INTEREST TERMS
- OVER 100 MODELS ON DISPLAY
- EXPERT STAFF EXPERT ADVICE
- GENEROUS PART EXCHANGES
- UP TO TWO YEARS' FREE SERVICING

SHOWROOMS

82 HIGH HOLBORN, W.C.1 (1 minute Holborn Underground)	CHAncery 7401
242/4 PENTONVILLE ROAD, N.1 (3 minutes from King's Cross Station)	TERminus 8200
228 BISHOPSGATE, E.C.2 (1 minute Liverpool Street Station)	BIShopsgate 2609
36 LEWISHAM HIGH STREET, S.E.13 (1 minute Lewisham Station)	LEE Green 2399
2 MARYLAND STATION, STRATFORD, E.15 (adj't Maryland Station)	MARyland 5879
205 HIGH STREET NORTH, E.6 (opposite East Ham Station)	GRAngeWood 6543

UP TO 50% OFF!

We have a fantastic selection of 1967 model tape recorders, new, shopsold and secondhand showing savings on the manufacturer's list price of up to 50%. Our quoted prices are absolutely unbeatable, so why not call into any of our showrooms and see the fantastic savings that we as Britain's largest tape recorder specialist company are able to offer you by virtue of our ability to purchase large quantities and pass the savings thus obtained on to you!

**HURRY
WHILE STOCKS LAST**

NOTE: HOURS OF BUSINESS

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

BISHOPSGATE:
Monday to Friday 9 a.m. to 6 p.m. Closed all day Saturday.
Open Sunday 9-30 a.m. to 2 p.m.

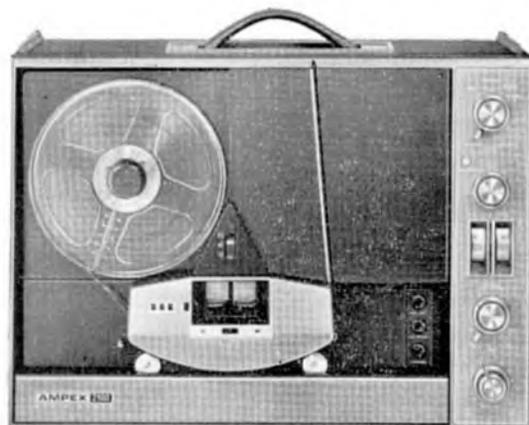
KING'S CROSS, STRATFORD, LEWISHAM, EAST HAM:
Monday to Saturday 9 a.m. to 6 p.m. Halfday Thursday.

NUSOUND TAPE RECORDER CENTRES

HEAD OFFICE: MAGNATAPE HOUSE, 191 PLASHET RD., UPTON PARK, LONDON, E.13 GRANGEWOOD 2185

Even without its bi-directional recording and monophonic mixer, the Ampex 2100 would still be the best recorder in the world

Give it a hearing



If you were to dismantle your new Ampex 2100 (which heaven forbid), you'd find solid state electronics, four exclusive deep cut heads, bi-directional recording, a monophonic mixer, dual capstan drive, automatic threading device, solid-cast aluminium construction etc.

But it's what you get out of your Ampex 2100 that counts.

Ampex have a name to live up to. A name for the finest sound recording. And the new Ampex 2100 gives our best sound yet. There's only one way to prove the Ampex 2100 outperforms any other recorder in its price range. Listen to them all and make up your own mind.

The illustrated Ampex is the standard 2163. But there's also the Ampex 2165-3 in oiled walnut finish or an uncased deck model, the Ampex 2153.

You'd think that with all this the Ampex 2100 would cost over £250. But it doesn't. *Appetite whetter: Wow and flutter at 7½ ips, .08%*

Ampex make the world's best tape recorders. 800 series, 1100 series, 2100 series. Speakers, tapes, accessories. Ask your dealer about our 4-track "Stereo Concert" bonus offer.

AMPEX

Ampex sales and service facilities are conveniently located throughout Europe and the Middle East. For more information write to: Ampex Great Britain Ltd., Acre Road, Reading, Berkshire, England. Telephone: Reading 84411. Ampex S.A., Via Berna 2, Lugano, Switzerland. Telephone: 091/3.81.12. Ampex Europa G.m.b.H., 6 Frankfurt Main, Düsseldorf Strasse 24, Germany. Telephone: 252001-5. Ampex S.A., Nivelles, Belgium. Telephone 067/249.21. Ampex, 41 Avenue Bosquet, Paris 7e, France. Telephone: 705.38.10.

NEW

Be among the first to hear the **Ditton 15**

The Ditton 15 is Celestion's new 3 element compact loudspeaker enclosure. Although only 1 cubic foot in size, this full-range 15 watt system gives improved bass performance over simple closed boxes because of a new concept in design—ABR (Auxiliary Bass Radiator).

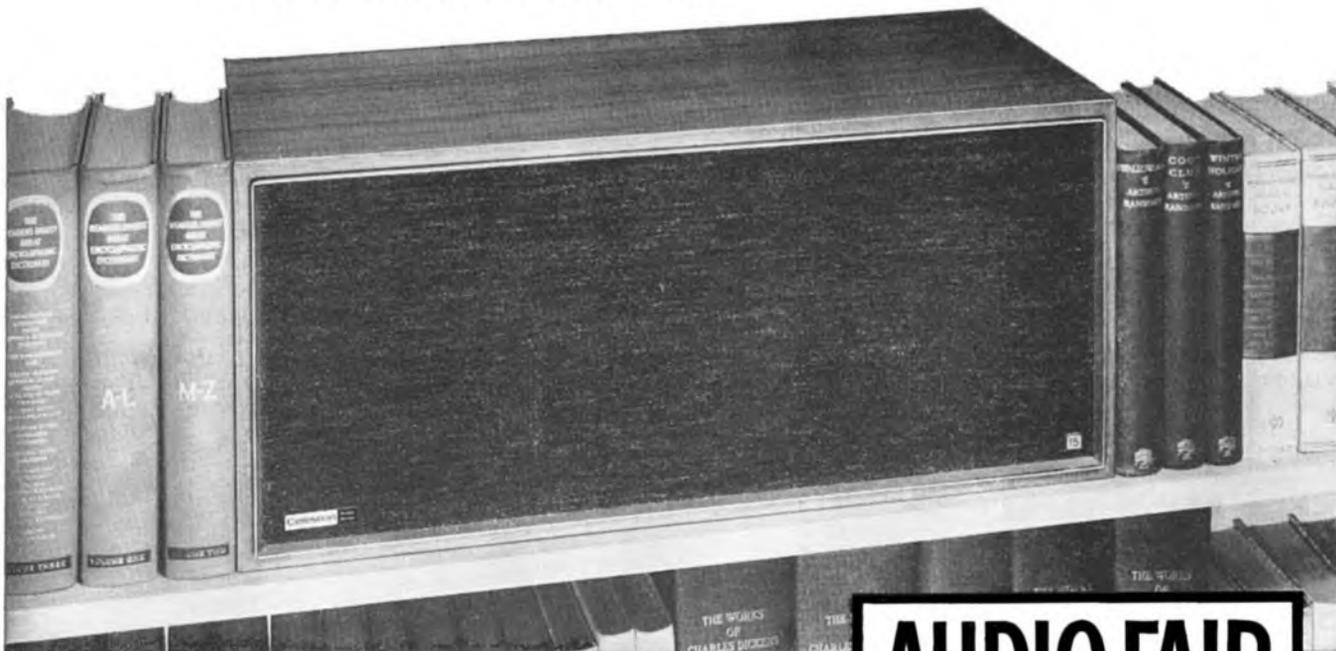
ABR gives the following advantages :

- extended low frequency response down to 30 Hz
- high sensitivity
- lower distortion

In addition, the Ditton 15 employs an entirely new 8" bass unit, plus the famous HF1300 Mark 2 high frequency unit.

Hear the Ditton 15 for yourself in Demonstration room 204 at the Audio Fair and ask as many questions as you like.

—the latest product of Celestion know-how and enthusiasm



AUDIO FAIR

Booth 5

Demonstration room 204

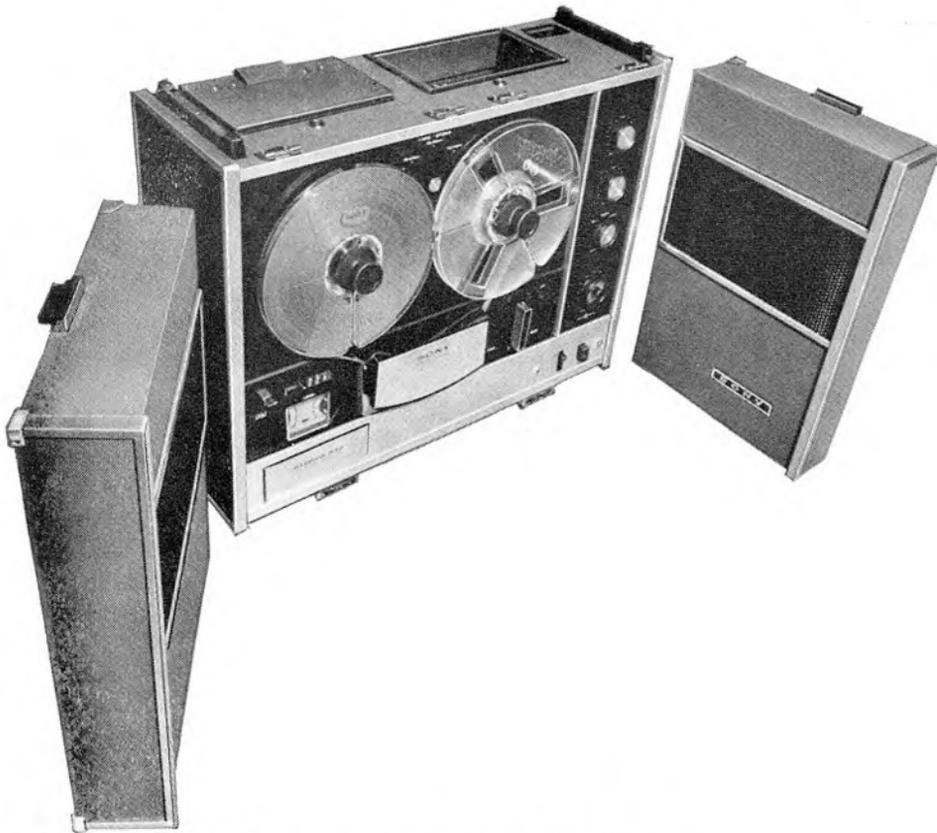
Celestion

Studio
Series

loudspeakers for the perfectionist

Rola Celestion Ltd. FERRY WORKS, THAMES DITTON, SURREY.
TELEPHONE: 01-398 3402

GD723



SONY research makes the difference

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

Specifications:

Power requirements: 65W, 100-125V and 220-240V AC. 50/60 c/s.

Tape speed: 7½ ips., 3¾ ips. and 1¾ ips. instantaneous switching with automatic equalization change.

Reels: 7" diameter or smaller.

Recording system: 4-track stereophonic or monophonic.

Frequency response: 30-20,000 cps. at 7½ ips. (± 3dB 50-15,000 cps. at 7½ ips.) 30-13,000 cps. at 3¾ ips. 30-10,000 cps. at 1¾ ips.

Wow and flutter: Less than 0.17% at

7½ ips. Less than 0.3% at 3¾ ips. Less than 0.4% at 1¾ ips.

Power output: 5W R.M.S. per channel.

Signal-to-noise ratio: Better than 48 dB (at peak record level).

Harmonic distortion: Less than 3% at 0 dB line output.

Level indication: Calibrated VU meter x 2. **Tone controls:** Separate controls for bass and treble.

Inputs: Low impedance microphone inputs: transistorised (will accommodate any microphone from 250 ohms to 1 K ohm impedance). Sensitivity -72 dB (0.19mV) High impedance (100K ohms) Auxiliary: Sensitivity -22dB (0.06V).

Outputs: Line outputs: 0 dB (0.775V), load impedance 100K ohms.

Speaker outputs: load impedance 2 x 8 ohms. Binaural monitor output: will accommodate stereo headset Model DR-3C (10K ohms impedance).

Integrated record/playback connector.

Input: Sensitivity -62 dB (0.6mV) Impedance 10K ohms.

Output: Sensitivity 0dB (0.775V) Impedance 10K ohms.

Dimensions: 19¼" wide x 9½" high x 15¾" deep.

Weight: 41 lbs. 10 ozs.

Accessories: Stereo recorded 5" tape, 7" reel. Two SONY dynamic microphone (F-96). Integrated record replay connector type RK-46 60c/s Motor pulley, Reel cap, Head cleaning ribbon, Splicing Tape.

Recommended retail price 120 gns.

Sony offer the finest range of tape recorders from the battery portable TC 900 to the studio quality TC777.

For further details see your Sony dealer or write to:

Sony U.K. Sales Division,
Eastbrook Road, Gloucester.

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

SONY®
RESEARCH MAKES THE DIFFERENCE

..... one switch to give you two mikes

The Philips P33 is a superb, professional microphone at a medium price, which provides cardioid or omni-directional characteristics — at the click of a switch.

The frequency response is 80 c/s to 15 Kc/s ± 3 db. It is flat over a wide range and remains flat in the low frequency range when used close up. In the cardioid mode sensitivity

at the rear is 17db less than at the front. Impedance is 500 ohms.

The P33 is mounted in a quick-release holder and can instantly be used as a hand-held microphone complete with a detachable, twin screened cable 16 feet in length. In addition an anti-vibration mounting is available, preventing transmission of rumble from the stand.



Modern appearance coupled with high quality make the P33 a must for entertaining, recording and public address. Ask your dealer for details of contact :

PETO SCOTT
sound and vision

PETO SCOTT LIMITED
Addlestone Road, Weybridge, Surrey. Tel : Weybridge 45511

PETO SCOTT for Philips professional sound

CW PS17



sound mixers with details
to your specification

Elcom complete mixing equipment is designed around the well known Elcom Electronic Fader which provides a noise free stepless fade.

A wide range of equipment is available from the transportable four channel Mono/Stereo battery/mains units to large multi-channel studio consoles.

Standard equipment can be provided at low cost with an unlimited combination of facilities to customers specification, and we are pleased to discuss specific requirements and submit quotations.

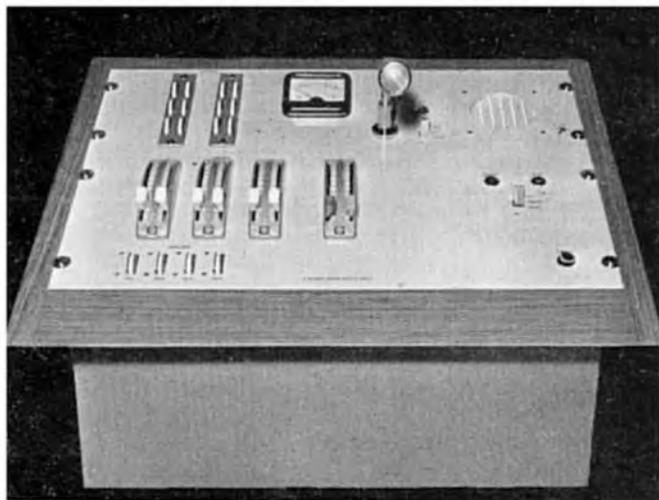
ELCOM

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ELCOM (NORTHAMPTON) LTD.

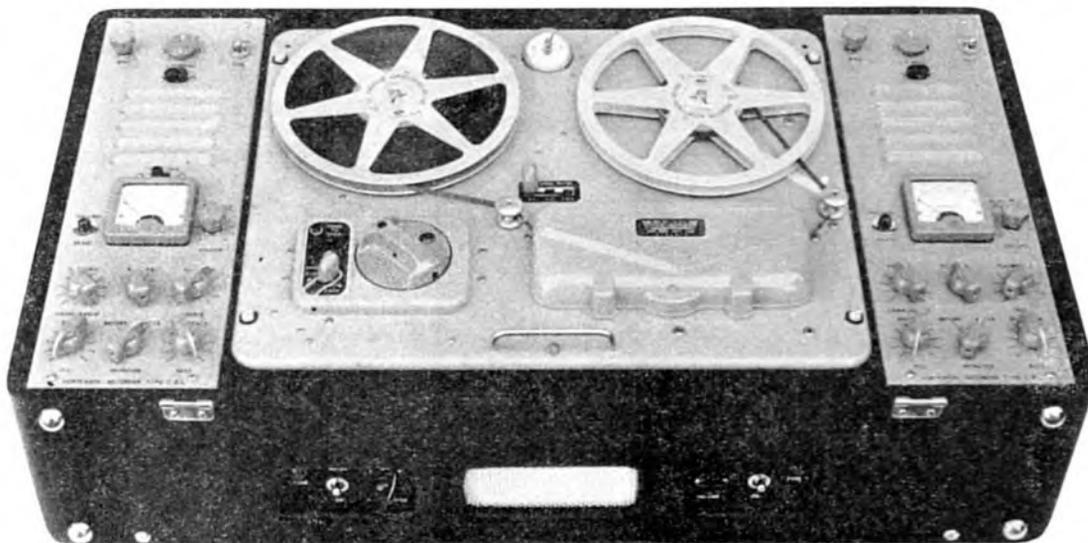
Weedon Road Industrial Estate

A member of the Painton group of Companies Northampton. Tel. Northampton 51873



Vortexion *quality equipment*

TYPE C.B.L. TAPE RECORDER



Here is a versatile stereophonic recorder which has no equal in its price group.

IT CAN record monaurally or stereophonically with its own mixed inputs from Gram, Radio or other sources and from high grade low impedance balanced line microphones. With good microphones, etc., the result is a suitable master for disc manufacturers. " Before and After " monitoring is provided together with adjustable metered bias for perfection.

IT CAN also make a recording on one track and then transfer it to the other track while measuring and listening to it and adding one or two more signals also metered. A special PPM type meter is now used.

IT CAN repeat the process and transfer this combined signal to the first track with one or two more signals. Composers use it for this purpose. One track may have music or commentary and the other cueing signals or commentary and either may be altered without the other.

IT CAN playback stereophonically or monaurally with its own amplifiers of $3\frac{1}{2}$ watts each.

Speeds $1\frac{7}{8}/3\frac{3}{4}/7\frac{1}{2}$ i.p.s. Price **£172 0s. 0d.**

Speeds $3\frac{3}{4}/7\frac{1}{2}/15$ i.p.s. Price **£180 0s. 0d.**

The Vortexion W.V.B. is a high quality monaural machine with " Before and After " monitoring. The recording inputs are a high sensitivity socket for moving coil or ribbon microphone and a high impedance socket for radio, etc., either of which can be selected by a switch. Superimposing and echo work can be done and the playback has reserve gain for abnormal requirements. This model cannot be converted for stereo playback, but it is a thoroughly reliable machine for the engineer specialising on monaural work.

Speeds $1\frac{7}{8}/3\frac{3}{4}/7\frac{1}{2}$ i.p.s. Price **£115 10s. 0d.**

Speeds $3\frac{3}{4}/7\frac{1}{2}/15$ i.p.s. Price **£128 0s. 0d.**

The Vortexion W.V.A. is a monaural machine which has a performance equal in sound quality to the other models. It possesses all the features of the W.V.B. except for " Before and After " monitoring, Dubbing and Echoes. The recording being made can be heard on the internal loudspeaker as in the W.V.B. and C.B.L. The controls are uncomplicated.

Speeds $1\frac{7}{8}/3\frac{3}{4}/7\frac{1}{2}$ i.p.s. Price **£96 7s. 0d.**

Speeds $3\frac{3}{4}/7\frac{1}{2}/15$ i.p.s. Price **£107 3s. 0d.**

All tape recorders have adjustable bias controls, low impedance mic. inputs for unlimited lengths of cable, highly accurate position indicators and meters to measure recording level and bias.

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

Telephone: L1Berty 2814 and 6242-3-4

Telegrams: " Vortexion London S.W.19 "

99

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

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

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

Three other high quality grades are in the Emitape range:

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

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

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



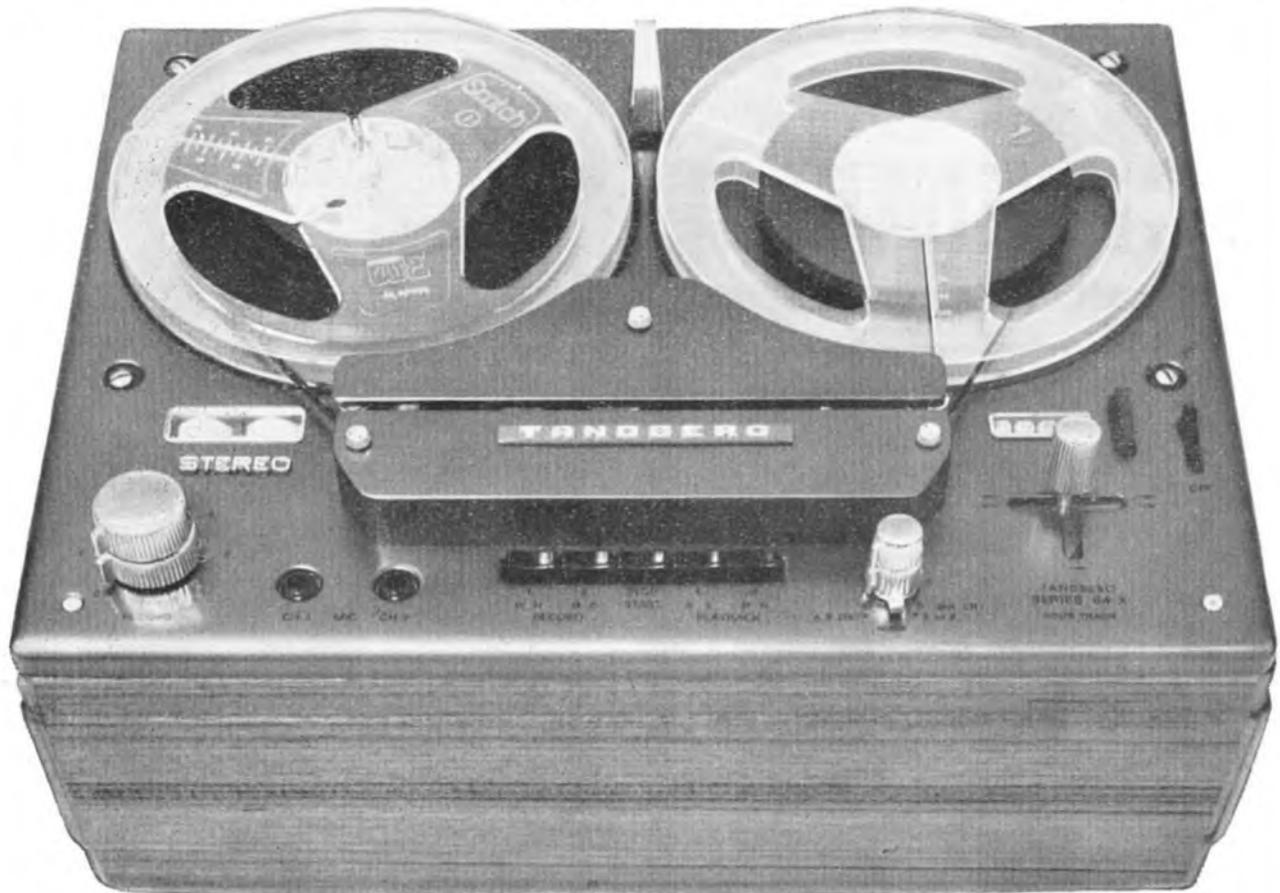
EMITAPE

THE MOST ADVANCED MAGNETIC RECORDING TAPE IN THE WORLD



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

The outstanding new Tandberg 6x



The world's best stereo tape deck plus new bias head for guaranteed frequency response and unbeatable signal to noise ratio

Tandberg have taken their finest tape deck, added a Bias head and refined the circuitry. The result is the Tandberg Model 64X.

Frequency Response:

7½" per sec: 20-25,000 c/s

(± 2 dB 30-20,000 c/s).

3¾" per sec: 20-18,000 c/s

(± 2 dB 30-15,000 c/s).

1⅝" per sec: 30-12,000 c/s

(± 2 dB 40-8,000 c/s).

Signal to noise ratio:

7½" per sec: 62 dB. 3¾" per sec: 59 dB.

1⅝" per sec: 56 dB.

* Also incorporates Multiplex Filters (for stereo radio recording).

* A centre channel amplifier for simultaneous playback of two tracks into mono headphones.

* A fully transistorised oscillator circuit.

* Cathode follower outputs.

* 'On and off the tape' monitoring.

* 'Sound on sound' facilities.

* Superb teak and stove enamel finish.

The Tandberg 2 or 4 track, 3 speed Series 6X. 115 Gns.

Please send me full details on the Tandberg

SERIES 6X

Also full details on the Series

8 9 12

tick as appropriate

Name

Address

Post to Dept. **TRM9**
Elstone Electronics Limited,
Hereford House, North Court,
off Vicar Lane, Leeds, 2.

SEE AND HEAR US AT THE 1967
AUDIO FESTIVAL AND FAIR
STAND NO. 17
DEMONSTRATION ROOM 212

Tandberg

Philips Cassette Recorders: excitingly easy new way to play music and record sound

Suddenly, it's fantastically easy to play music - anywhere. And to record sound. Because Philips Cassette Recorders are so simple that you can use them with your eyes shut! Their tape comes loaded in special cassettes that just snap in for instant use. And you get superb pre-recorded music on fabulous new Musicassettes - in a wide range of titles. You have three Philips Cassette Recorders to choose from.

Model EL3301T is a 27 gn play-anywhere battery portable that travels in a carrying case, has simple controls including a remote stop/start switch, and can even be mounted in your car. The 35 gn Mains/Mono Model EL3310 has a teak-finished cabinet, exclusive hinged 'Sound Mirror', Automatic Recording Control

for perfect recordings, and push-button cassette ejection.

Model EL3312 is a superb

Mains/Stereo recorder at 48 gns, with two Hi-Fi speakers extra at 10 gns plus 3/1 P.T. surcharge each. All prices cover many useful accessories.

Model EL3312



Model EL3310



Model EL3301T



See your Philips Dealer or write for free brochure to Philips Electrical Ltd., Century House, Shaftesbury Avenue, London W.C.2.



PHILIPS - the friend of the family

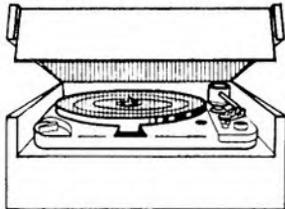
THIS IS IT!



system 20 by Wharfedale

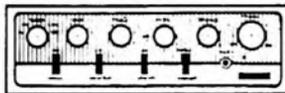
System 20 is the brilliant new High Fidelity system by Wharfedale the system by which all others will be judged.

For the first time ever



Wharfedale—makers of the world's finest loudspeakers—offer a complete High Fid-

elity system. This is built to extremely high performance



standards that will satisfy the most critical professional but it is simplicity itself to operate.

SYSTEM 20 comprises:

Wharfedale WHF-20 transistorized stereo amplifier (20 watts per channel).

Wharfedale WFM-1 High Fidelity transistorized stereo tuner and two alter-

native transcription turntables—the WTT1 & WTT2 containing the THORENS TD124 and the GARRARD LAB80' respectively.

There is a choice of two housings—the elegant Howard console and the



modern as tomorrow Selby lowboy.

Alternatively Matched Units are available as illustrated.



For 24 page colour folder giving full details and specifications of this exciting new High Fidelity development complete the coupon now.

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TOWN

COUNTY

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RANK WHARFEDALE LTD. IDLE BRADFORD YORKSHIRE

Get the most out of your Tape Recorder buy . . .

Choose from the widest range—British, American, Japanese, Continental—every model backed by R.E.W. technical knowhow and Advisory Service and the unrivalled after-sales facilities provided by Britain's largest Mail Order Tape Recorder specialists and stockists. When you've selected the machine you want, R.E.W. interest free, no-fuss purchase terms, lowest possible deposits, free insurance, carriage and packing make purchase a pleasure.

Always at least 400 machines in stock—including an ever-changing selection of high quality used machines for the beginner or the professional at sensible prices!

BATTERY TAPE RECORDERS

	PRICE	DEPOSIT	12 P'M'T's	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Philips 3301 ...	27 gns.	8 6 0	1 13 4	
Grundig TK6/L ...	73 gns.	26 13 0	4 3 4	
Grundig C-100 ...	39½ gns.	13 9 6	2 6 8	
Uher 4000 S ...	99 gns.	34 19 0	5 15 0	
Philips EL 3586 ...	27 gns.	8 6 0	1 13 4	
Akai X-4 Stereo ...	99 gns.	34 19 0	5 15 0	
Uher 4000 L ...	103 gns.	36 3 0	6 0 0	

MONO TAPE RECORDERS

	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brenell Mk. 5 Series 3 ...	74 gns.	25 18 0	4 6 4	
Brenell M Series 3 ...	93 gns.	33 3 0	5 7 6	
Ferrograph 631 ...	95 gns.	33 5 0	5 10 0	
Grundig T.K. 23L ...	54 gns.	18 18 0	3 3 0	
Philips EL 3558 ...	42 gns.	15 2 0	2 8 4	
Philips EL 3556 ...	62 gns.	22 2 0	3 11 8	
Akai 910 ...	62 gns.	22 2 0	3 11 8	
Sony T.C.—357-4 ...	49 gns.	17 3 0	7 1 6	
Truvox R.102 ...	89 gns.	31 3 0	5 3 10	
Truvox R.104 ...	89 gns.	31 3 0	5 3 10	
Vortexion V.V.A. Mk. 6.	£96.7.0	32 7 0	5 6 8	
Wyndson Vanguard ...	59 gns.	20 19 0	3 8 4	

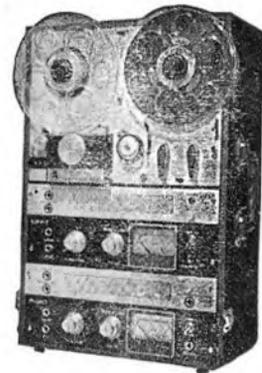
STEREO TAPE RECORDERS

	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Akai 1710 ...	79 gns.	27 19 0	4 11 8	
Akai MB ...	136 gns.	47 16 0	7 18 4	
Akai 335 ...	239 gns.	83 19 0	13 18 4	
Brenell STB 3 ...	£150	50 0 0	8 6 8	
B. & O. 2000 De Luxe K	125 gns.	43 15 0	7 5 10	
B. & O. 2000 De Luxe P.	129 gns.	45 9 0	7 10 0	
Revox 736 ...	£130	44 0 0	8 0 0	
Sony T.C. 260 ...	97 gns.	34 17 0	5 11 8	
Truvox P.D. 102-4 ...	93 gns.	33 3 0	5 7 6	
Tandberg Series 6 ...	110 gns.	38 10 0	3 4 2	
Tandberg Series 12 ...	105 gns.	37 5 0	6 1 0	
Ferrograph 632 ...	132 gns.	46 12 0	7 13 4	
Sony T.C. 250 Deck ...	57 gns.	19 19 0	3 6 6	

and don't miss the opportunity to see the fabulous AKAI range

Specially comprehensive demonstration facilities for these superb machines, are a star feature of the R.E.W. Service. We carry the full range, all on display and readily available for comparative demonstration. Visit our showroom now. See hear, and buy the model of your choice with all the advantages of dealing with Britain's Largest Hi-Fi and Tape Specialists.

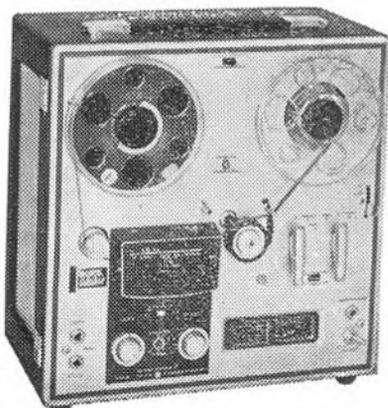
If you are unable to call, use our fast and friendly mail order service with absolute confidence.



AKAI M8

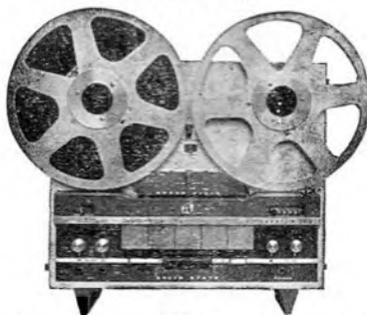
High quality 4-speed, 4-track stereo mono recorder featuring Cross-field head. Vertical or horizontal operation. 4 hours' stereo recording on 1,200 ft. standard tape. 2 stereo fill-in speakers. Sound-on-sound. 6 watts per channel. 136 gns. Interest Free Terms. Deposit £52.16.0 and 12 monthly payments of £7.10.0.

AKAI 1710



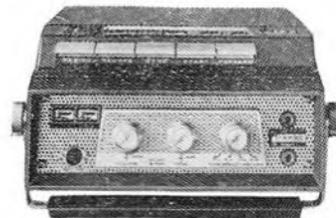
A completely self-contained, 3-speed, 4-track stereo mono recorder. Two 7 in. x 5 in. built-in speakers. 3 watts per channel. Attractive styling and AKAI precision finish. Takes up to 7 in. reels. 79 gns. Interest Free Terms. Deposit £27.19.0 and 12 monthly payments of £4.11.8.

AKAI X300



A studio type 3-speed 4-track stereo mono recorder of professional quality. Fully solid state, 20 watts per channel amplifier. Crossfield heads; 10½ in. reels; keyboard controls, and many other features. 190 gns. Interest Free Terms. Deposit £66.10.0 and 12 monthly payments of £11.1.8.

AKAI X4



Fully transistorised stereo mono, battery mains portable recorder. 4-track; 4-speeds; Cross-field heads; superb low-speed frequency response. Mains-rechargeable battery 5 in. reels. Weighs only 11.2 lb. 131 gns. Interest Free Terms. Deposit £47.11.0 and 12 monthly payments of £7.10.0.



R.E.W. (Earlsfield) Ltd., Dept. T.R.M., 266/8 Upper Tooting Road, London, S.W.17.
Telephone: (01) 672/8267 or BAL 9175

9 a.m. — 6 p.m. weekdays. Closed 1 p.m. Wednesdays. — **EASY PARKING ALWAYS.**



SPEAKER SENSE FROM **Lowther**

HEAR THE DIFFERENCE FOR YOURSELF
at the Audio Fair

VERY FEW PEOPLE are able to reproduce and enjoy fully the quality of their recordings. Because of its conversion efficiency Lowther's specialised drive unit/folded horn combination gives full frequency and power range from a modest output stage.

Lowthers have always been the champion of the one high flux drive unit reproducer system, and are proving beyond doubt that this theory is correct. The P.M. 7 drive unit is the result of 10 years study and development — always aimed "towards perfection".

Why not judge for yourself by listening to our demonstrations in **Rooms 404 and 439**? And if you need information or advice our qualified staff will be only too pleased to help.

★ ★ ★

We shall be looking forward to seeing you there, but if you can't make it please write for full details to:

THE LOWTHER MANUFACTURING CO. St. Mark's Road, Bromley, Kent

LOWTHER  *towards perfection*

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

Compare any Heathkit model for price, performance, quality

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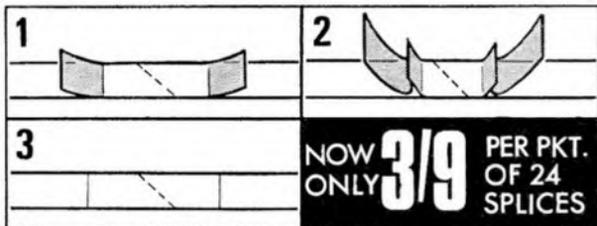
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Mark 5 Series 3

Mono; half-track; two heads; magic eye.
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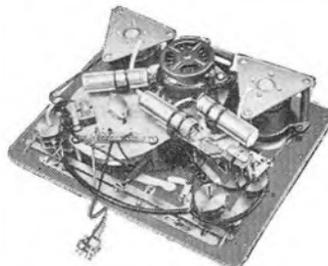
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Standard equipment on all Brenell recorders, this deck incorporates all the features demanded by the enthusiast who prefers to assemble his own equipment. Prices from £38.



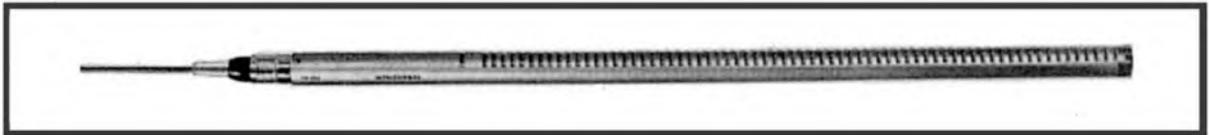
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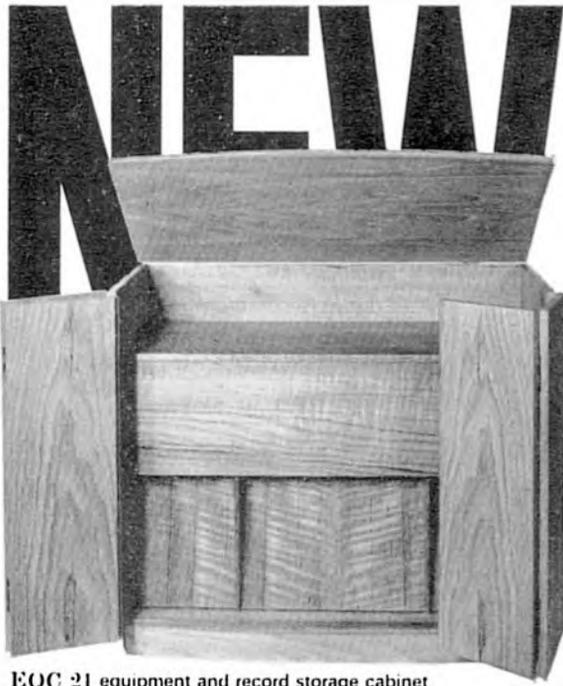
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Do you know the rest of the Sennheiser range or products? RF. condenser microphones (like the 'gun mic.' shown above) Radio microphones, Miniature magnetic microphones and earphones, Hi-Fi reproducers, Audio test equipment.

Audio Engineering Ltd

33 Endell Street London WC2 TEM 0033



EQC 21 equipment and record storage cabinet



EQC 20 equipment and record storage cabinet with tambour doors

Audio Fair ROOM 104

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CALTHORPE MANOR · BANBURY · OXON

TAPE

RECORDING
MAGAZINE

Vol. 11

No. 4

April 1967

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Our comprehensive coverage of the 1967 Audio Fair has meant that some of our regular features have had to be held over until next month, when they will appear together with new, exclusive items of great interest to all enthusiasts.

FRONT COVER: The attractive lady is none other than ballerina Amina Hanafy. Well known for her work with Covent Garden Opera, Sadlers Wells and Carl Rosa Opera, she listens attentively with professional interest to the sound produced by one of the latest cassette machines, the Sonic 8.

Designed and made in this country by Van der Molen, it is based on the Philips Compact Cassette mechanism and offers full stereo record and play-back facilities. The left-hand speaker can be stored within the cabinet when not in use, but is provided with a long extension cable to ensure adequate separation from the right-hand channel for stereo reproduction.

Impressed by the smart, modern appearance of the equipment, Amina loves the simplicity of cassettes.

"TAPE Recording Magazine" is published on the third Wednesday in the month, by Print and Press Services Ltd., from Prestige House, 14/18 Holborn, London, E.C.1.

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

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WHAT TO LOOK FOR STAND-BY-STAND AT THE

AUDIO FAIR '67

RUSSELL HOTEL, LONDON, MAR. 30/APR. 2

ACOS (Stand 43, Demonstration Room 449).

Cosmocord Limited, Eleanor Cross Road, Waltham Cross, Hertfordshire. Waltham Cross 27331.

The main items on display will be the Acos "Ninety" family of cartridges which have been designed to suit all reproducing equipment, from a simple record player to a hi-fi installation. The series includes crystal and ceramic cartridges in both mono and stereo models.

* * *

AGFA-GEVAERT (Stand 40).

Agfa-Gevaert Limited, Magnetic Tape Division, Great West Road, Brentford, Middlesex. Isleworth 2131.

Agfa Magnetone tape in cassettes will be on show for the first time. Two cassettes are offered, the Agfa C 60 giving a total of 60 minutes playing time and suitable for the Philips type mechanism, and the Agfa DC 90 giving a total of 90 minutes playing time and suitable for the DC type mechanisms as used by Grundig and Telefunken.

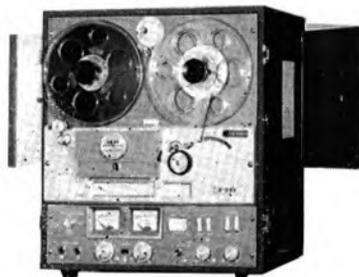
Yet another idea inspired by the popularity of cassettes is the development of the Agfa Magnetone Universal-Cassette. Designed for those who use conventional 3-inch tape spools it is made of unbreakable plastic in conformity with all international regulations and is intended for sending through the post. In future, all 3-inch spools of PE 31, PE 41 and PE 65 tapes will be supplied in Universal-Cassettes, each with a spare Phonopost label.

Also on show will be Agfa "Novodur" plastic library boxes for various reel sizes, Magnetone Video Recording Tape, PEV 385 and professional sound recording tapes PER 525 and PER 555.

AKAI (Stand k, Demonstration Room 319, Office 324).

Pullin Photographic Ltd., The Rank Organisation, 11, Aintree Road, Perivale, Greenford, Middlesex. Alperton 1541.

The full range of Akai professional and amateur stereo/mono tape recorders, hi-fi amplifiers and tuners, accessories and speakers will be on show. Akai tape recorders now extend from a 79 guineas stereo model to a £500 Studio Console unit. All are designed for stereo/mono operation and are "FM multiplex biased."



Akai 355

Attention is specially drawn to the Akai X-2000 recorder operating four-track, stereo/mono with an extremely comprehensive specification. Employing the well-known Akai Crossfield Head system the machine has 20 watts output per channel, four recording speeds, 1½ to 15 ips, and facility for recording and playing back in both directions. Complete with automatic control dial, which can be pre-set for automatic shut-off, automatic stop or reverse operation whilst recording or playing back, the price will be approximately 150 guineas.

THE 1967 CONTEST

THE 1967 British Amateur Tape Recording Contest takes a major stride forward. With the agreement of the former Organising Committee, which was representative of a number of leading firms in the industry, an entirely new committee has been formed to replace it.

The new Organising Committee consists of Mr. C. Rex Hassan, Director of the International Audio Festival, as Chairman; Miss Brenda Marriott, of Grundig (Gt. Britain) Ltd., as Vice-Chairman and Treasurer; Mr. John Bradley, of the Federation of British Tape Recording Clubs, as Hon. Secretary; and the following well-known audio journalists: Donald Aldous, of Audio Record Review, John Borwick, of The Gramophone, John Crabbe, of The Tape Recorder, Fred Judd, of Amateur Tape Recording, and Douglas Brown, of "TAPE Recording Magazine."

This new arrangement has been made possible by "TAPE Recording Magazine's" agreement to assign the copyright of the Contest—which it established ten years ago—to the new Committee for a term of years. The intention is to

ensure the Contest wider sponsorship and publicity.

The new Committee has decided that the Contest should revert to its earlier form, with a number of categories corresponding approximately to those of the International Recording Contest (CIMES). The CIMES classes are Composition, Documentary, Music, Actuality, Technical Experiment and Schools. The British Contest may be divided into classes under slightly different titles, but they will match conveniently to the International classifications. There will be an additional class for tapes dealing with a set subject.

The first prize in the 1967 Contest will be cash or equipment of a minimum value of £100—the exact details of the prize list will be announced later.

It is hoped that entry forms for the 1967 Contest will be available at the International Audio Festival at the end of March. The closing date will be December 31 and prizes will be presented at the 1968 Audio Festival.

Fuller information will be published here, with an entry form and the full rules, at a later date.

A limited number of complimentary tickets for the 1967 International Audio Festival and Fair are available to readers of "TAPE Recording Magazine." Each ticket admits two. Please apply by letter, enclosing a stamped and addressed envelope to:

TAPE RECORDING MAGAZINE,
Dept. A.F., Prestige House,
14/18, Holborn, E.C.1.

Please do not include any other communications in the same envelope.

AKG (Stand 14, Demonstration Room 302, Office 301).

Politechna (London) Limited, Eardley House, 182/4 Camden Hill Road, Kensington, London, W.8. Park 0711.

The full range of AKG microphones will be on show, from the aristocratic, professional condensers to the high quality amateur moving coil models, together with stands and fittings.

Two popular microphones introduced for the first time last year, the D109 lavalier and the D202 cardioid moving coil, will again be present, together with some interesting new models based upon the separate moving coil systems of the D202. These will be the D200, a new and less expensive two-way, cardioid, dynamic microphone, similar in performance to the D202, and the D224, a top professional two-way cardioid with condenser quality. Other new models to look out for are D707, D112, D110, and C401 condenser microphone using field effect transistors in place of conventional thermionic valves, D11D, a new, inexpensive cardioid microphone of the stick type that will sell at approximately £6, D11D Stereo Twin, comprising a pair of D11D's with the necessary double stand mounting brackets and various gadgets for stereo use. Headphones will include the K60, acoustically better and rather more expensive than the well-known K50, and also the K68 head set which uses the new K50 headphone and a close talk microphone mounted on a swivel boom.

* * *

RICHARD ALLAN (Stand i, Demonstration Room 548, Office 544).

Richard Allan Radio Limited, Bradford Road, Gomersal, Nr. Leeds, Yorkshire. Cleckheaton 2442.

New to the range of high fidelity loudspeakers from Richard Allan is the Sarabande, a complete, medium sized, wide range, triple speaker assembly. The Sarabande incorporates another new development, a mid-range and tweeter module which follows the same general pattern as the very successful high fidelity module in that both 4 in. and 5 in. units are mounted on an aluminium plate, 11 x 6½ x ½ in., the 5 in. unit being an integral part of the plate. Different cone and magnet assemblies are utilised to suit the specialised purpose for which it is intended.

The mid-range module is available separately, either in chassis form or complete in cabinet. It is recommended as ideal for adding to existing systems for extra sparkle, for filling in the "hole in the middle" and for a multitude of other applications. It is supplied complete with cross-over network and sensitivity control for ease of matching to existing loudspeakers.

In addition, the popular Richard Allan high fidelity module will be shown and demonstrated.

AMATEUR TAPE RECORDING (Stand 39).

Haymarket Press Ltd., 9, Harrow Road, W.2. Ambassador 3200.

* * *

AMPEX (Stand a, Demonstration Room 536, Office 505).

Ampex International, 72 Berkeley Avenue, Reading, Berkshire. Reading 55341.

A new series of professional quality stereo tape recorders for home use, featuring "bi-directional recording" and sound mixing in addition to automatic reversing and threading will be shown. The new Ampex 2100 series is designed to record and play in both directions, providing up to four hours of high quality stereo recording without changing reels. It also incorporates the highly successful automatic reversing and simplified threading features previously introduced with the Ampex 2000 series.

Solid state electronics, vu meters, three speed operation and dual capstan drive are other features. A fourth head has been included, permitting "bi-directional" recording. A single jack stereohead plug is front mounted for easy access. Sound mixing is possible with the 2100 series in the monaural mode. The 2100 series is available in two models, 2153 as an uncased deck with stereo pre-amplifiers, or model 2163 as a portable recorder with stereo pre-amplifiers and power amplifiers, complete with one Ampex 2001 dynamic microphone and dust cover.



Ampex 2163

Ampex will also show the 1100 series solid state stereo tape recorder system and the 800 solid state stereo recorder which offers 3-speed operation and several advanced features in head and deck design.

Completing the Ampex exhibits will be a variety of speakers, microphones and other accessories, together with Ampex pre-recorded and professional quality audio tapes.

* * *

ARENA (Stand 7, Demonstration Room 215, Office 216).

Highgate Acoustics, 71/73, Great Portland Street, W.1. Museum 2901.

The Scandinavian origin of the Arena range of audio equipment will only be too evident from its clean lines and contemporary styling. To meet the enormous interest in stereophonic broadcasts and the reproduction of stereo records a new range of Arena equipment will be demonstrated. The T2500H stereo radio with pre-selection FM tuner, the T2500F stereo tuner amplifier with pre-selection FM tuner, T2400 stereo FM tuner only with automatic scanning (2 x 15 watt) and pre-selector, and the F210

stereo amplifier (2 x 10 watt). The construction of the pre-amplifier is of considerable interest as it is composed of Arena's totally enclosed modules. Each module is the size of a pocket match-box and has 9 plugs which plug into a miniature valve socket. Qualified staff will be available to discuss both these and all other models in the Arena catalogue.

* * *

ARMSTRONG (Stand 45, Demonstration Room 538, Office 539).

Armstrong Audio Limited, Warlters Road, London, N.7. North 3213.

Details of new products in the Armstrong range to be shown for the first time will not be available until immediately before the Fair. A full report on these will appear in our May edition.

Included in the display will be the well-known 127 stereo tuner amplifier, the 127M mono tuner amplifier and the higher powered 227M mono tuner amplifier. Featuring optional shelf mounting cases which enable individual items to be used in a "unit hi-fi" system, prices range from £29 18s. 9d. for the 127M to £40 1s. 6d. for the 127 stereo and 227M mono tuner amplifiers.

* * *

AUDIO & DESIGN (Stand 64, Demonstration Room 121).

Audio & Design Ltd., 40, Queen Street, Maidenhead, Berks. Maidenhead 25204.

* * *

AUDIO & RECORD REVIEW (Lounge 155).

Audio & Record Review, 4, Mill Street, London, W.1. Hyde Park 0479.

* * *

AUDIO TECHNICA (Stand 26, Demonstration Room 318).

Shi-ro (U.K.) Ltd., 5, Queen Street, E.C.4. Avenue 6421.

* * *

BASF (Stand 33, Demonstration Room 234, Office 233).

BASF United Kingdom Limited, 5a Gillespie Road, London, N.5. Canonbury 2011.

The BASF stand will feature two completely new products. The swivel plastic box for tapes has been specially designed to fit neatly into a tape library or bookshelf (in fact it resembles a book in appearance) and the new compact cassette is being introduced at the same time.

The cassette is for use with the Philips cassette tape machines or other models fitted with the Philips mechanism. It will be available in two sizes, the C60 and C90, giving respectively 30 and 45 minutes programme time on each side.

* * *

BBC (Ground Floor Display).

British Broadcasting Corporation, Portland Place, London, W.1. Langham 4468.

Staff will be available to answer visitors' inquiries on all aspects of BBC programmes, including the VHF multiplex stereo service.

* * *

BEYER (Stand 65, Demonstration Room 313).

Fi-Cord International, Charlwoods Road, East Grinstead, Sussex. East Grinstead 21351.

A full range of Beyer ribbon and moving coil microphones will be on show, together with accessories, including transformers, stands, booms and clamps. Beyer microphones suitable for all applications from broadcast to domestic quality are available.

B.K.S.T.S. (Demonstration Room 343).

B.K.S.T.S., 164, Shaftesbury Avenue, W.C.2. Temple Bar 8915.

A demonstration tape will be reproduced so that visitors can judge for themselves the high quality standard that may be attained in recorded sound. Comprising a number of musical excerpts, the emphasis will be on quality of recording rather than quality of musical performance.

* * *

B. & O. (Stand 54, Demonstration Room 322, Office 323).

Bang & Olufsen U.K. Sales Division, Mercia Road, Gloucester. Gloucester 26841.

This will be the first occasion on which Bang & Olufsen have exhibited, and arrangements are being made to meet the popular interest which it is anticipated will be shown in their products.



Beocord 2000

A static display of the full Bang & Olufsen range will be exhibited on Stand No. 54, which will be manned at all times, and visitors may obtain information, brochures and prices from here. Continual demonstrations at half-hourly intervals will be given on all items of equipment in Room 322. Technical staff will also be in attendance in Room 322 to answer queries from visitors.

The equipment being shown and demonstrated will include not only the Beocord 1500 and Beocord 2000 tape recorders, but also the full range of radio tuners and high fidelity equipment.

* * *

BRAUN (Stand 63, Demonstration Room 312, Office 326).

Fi-Cord International, Charlwoods Road, East Grinstead, Sussex. East Grinstead 21351.

Braun claim that their Hi-Fi range, some of which has never been seen in this country before, is produced with meticulous precision and the most advanced engineering techniques. The variety of units include a portable radio receiver, radiogram, tape recorder deck, amplifiers, loudspeakers etc. Released at the Fair for the first time in this country is the Braun 1000 range—claimed by the manufacturers to be the most exclusive Hi-Fi music system in the world.

* * *

BRENELL (Stand 30, Demonstration Room 304, Office 340).

Brenell Engineering Co. Ltd., 231-235 Liverpool Road, London, N.1. North 8721.

A full range of mono and stereo tape recording equipment will be exhibited and demonstrated by Brenell Engineering Co. Ltd. Recording enthusiasts will undoubtedly pay much attention to the design de-

tails of the latest Brenell deck which has three outer rotor motors, a self-compensating braking system, large balanced flywheel, and a capacity to accommodate up to four heads. A stereo version of the Brenell deck and the new "hi-fi tape link" will be shown and demonstrated.

The wow and flutter figures for the Mk 5 series 3 deck are quoted as less than 0.05 per cent at 15 ips, 0.1 per cent at 7½ ips, 0.15 per cent at 3¼ ips, and 0.25 per cent at 1½ ips.

Of particular interest will be the Brenell STB 2/5/2 stereo unit which incorporates separate record and playback pre-amplifiers. Designed for the hi-fi enthusiast who wishes to add really high quality mono/stereo recording facilities to his present installation, the four-speed deck has four heads offering half track stereo recording, together with a playback facility for reproducing quarter-track commercial stereo tapes. It has a variable bias facility and mixing for four input signals. Monitoring is both before or after record, and the cathode follower outputs are designed to suit any external amplifier.

BROWN (Stand 46, Demonstration Room 317, Office 327).

S. G. Brown Limited, King George's Avenue, Watford, Hertfordshire. Watford 23301.

S. G. Brown Limited (a Hawker-Siddeley company) are exhibiting a representative range of their high quality head sets, including models for amateurs and professionals.

The Dynamic is recommended for audio applications, having exceptional noise exclusion characteristics and the capability of providing high fidelity mono or stereo reproduction at all sound levels up to 120 dB over a range of frequencies from 20 to 20,000 Hz.

For the professional user the Canada HA10 has circumaural earpieces featuring liquid-seal earpads, a special design of cavity cup divider in hf-damping material, and by the use of moving coil insets is said to provide genuinely true-to-life reproduction and an outstanding performance.

In addition to these head sets there will be shown other models from their extensive range, including the Freelance for use with inductive loop audio systems and the Dynaflex featuring a flexible boom for its microphone.

BSR (Stand No. 70, Demonstration Room 218, Office 225).

BSR Limited, Monarch Works, Old Hill, Staffordshire. Cradley Heath 69272.



BSR TD20 Deck

On show in Booth No. 70 will be the newest three-speed BSR tape deck, the TD20. Introduced shortly before Christmas, it is available in both stereo and monaural versions with two or four-track BSR

heads. Features of its modern styling are the advanced design of the control linkage so that only the lightest finger tip pressure is required to engage the direct action keys. The UA65 turntable unit will be seen at the Fair for the first time. Of sophisticated design, the unit incorporates a stylus pressure control and integral mechanical cueing device, an extra light-weight cartridge shell with finger lift, a tubular pick-up arm with automatic lock, and 11 in. diameter, deep rim turntable. Also on show for the first time will be a new feature in the UA70 record changer, comprising a special anti-skate device which minimises tracking error and thus prevents damage to records or sound distortion.

Continuous sound demonstrations of the UA70 will be given throughout the day in Demonstration Room 218.

CELESTION (Stand 5, Demonstration Room 204, Office 240).

Rola Celestion Limited, Ferry Works, Thames Ditton, Surrey. 01-398 3402.

This year Celestion are demonstrating for the first time something new and different in compact (1 cubic ft.) loudspeaker enclosures—the Ditton 15.



Ditton 15

The Ditton 15 is a 3 element, 15 watt system, incorporating a new type of ultra-low frequency unit, the Auxiliary Bass Radiator. This is said to give deeper, cleaner bass within the range of 30–60 Hz than is ordinarily obtained from simple, closed boxes of comparable size. Other benefits are said to include lower distortion and higher sensitivity. The other two units employed are the entirely new 8 in. long throw bass and middle speaker and the already well-established HF 1300 Mk 2 high frequency unit.

Also being demonstrated will be the popular Ditton 10, which is outstanding in design and performance amongst the truly miniature systems. The full range of Celestion high fidelity loudspeakers will be on view at Stand 5.

CONNOISSEUR (Stand 71, Demonstration Room 145, Office 162).

A. R. Sugden & Co. Ltd., Market Street, Brighouse, Yorks. Brighouse 2142.

The Connoisseur exhibit will comprise transcription turntables, arms and cartridges. Both the Craftsman and the Classic turntables have earned an enviable reputation, the latter bringing a new approach to turntable and pick-up design. Mounted on a shallow wooden plinth only 1½ ins. deep, the Classic uses two slow speed synchronous motors, one for 33½ and the other for 45 rpm.

DECCA (Stand j, Demonstration Rooms 235 and 236, Office 205).

Decca Record Co. Ltd., Ingate Place, Queenstown Road S.W.8. Macaulay 6677.

For two years the Decca FFSS Mark IV Series heads and cartridges have been reserved for export, but as from 1st April a small quantity will be available for the home market. These entirely new products, representing a complete break with tradition, will be demonstrated in Room 236; in Room 235 the more conventional Deram range will be shown, together with loudspeaker enclosures.

DESIGN FURNITURE (Stand e, Demonstration Room 104, Office 138).

Design Furniture Limited, Calthorpe Manor, Banbury, Oxfordshire. Banbury 4726.

Design Furniture Limited will again be showing an extensive range of enclosures designed to house hi-fi equipment, record cabinets and speaker enclosures.

Four equipment cabinets will be making their debut at the Fair, the elegant EQC18, inspired by their design competition which was successfully launched last autumn, and the new Sheraton style reproduction cabinet. EQC20, based on a very popular record cabinet in the Design Furniture range, is primarily intended for the growing choice of shelf unit amplifiers and tuners. EQC21 is a new equipment cabinet for those who wish to have both a transcription unit and tape deck, but do not have the space required for the popular, long, low cabinet, EQC14. Below the adjustable and divisible motor board is a generous amount of space for amplifiers and tuners, some of which can be used for record storage.

ELCOM (Stand 56, Demonstration Room 249).

Elcom (Northampton) Ltd., Weedon Road Industrial Estate, Northampton. Northampton 51873.

Amongst the range of sound equipment shown by Elcom (Northampton) Ltd. will be several of the new modules developed by the laboratories of the Painton Group of Companies. The main feature of the display is a control console suitable for adaptation to many applications, including local broadcasting and audio visual aids.

Of great interest to recording enthusiasts will be a new portable mixer built into a suitcase style housing. This is a four channel unit with built-in talk-back and inputs suitable for four microphones plus tape recorder. Because of its compact design and complete versatility it is ideal for location work.

Amongst the modules on show is the EP51 tone unit, one of the several completely new items added to the already comprehensive range. This unit is of the front of panel, plug-in type, incorporating passive equalisation circuitry backed by a transistorised amplifier.

E.M.I. (Stand 32, Demonstration Room 147, Office 148).

E.M.I. Limited, Blyth Road, Hayes, Middlesex. Hayes 3888.

Catering for the enthusiast who wishes to build his own loudspeaker enclosure, E.M.I. will be showing a completely new range of seven matched loudspeaker sets, each set complete with crossover unit. These sets are intended for building into enclosures with capacities of from .4 to 4 cubic feet. To demonstrate the capabilities of the new loudspeaker sets tapes will be played back on an E.M.I. BTR4 machine. The BTR4 has been acknowledged as one of the leading professional recorders.

Please turn to page 140

FAIR TOPICS

HOW TO JUDGE—HOW TO ASSESS

THE annual Audio Fair at the Russell Hotel has acquired an almost religious significance. Devotees pass from shrine to shrine; the glazed eye of the mystic can be seen in every temple of sound. As the pilgrims make their way home do they feel uplifted, or are they disillusioned? Are the miracles they have heard accepted, or do they remain sceptical?

The idea of the Fair is a brilliant conception, appreciated by trade and public alike. The choice of venue is excellent—only in an hotel with its large number of small, completely separate, rooms could audio equipment be properly demonstrated. And yet it is difficult to say just how the visiting public should assess what they see and hear.



Behind the scenes. Bob Fisher, of S.T.C., plans the series of piano recital recording sessions to be given as microphone demonstrations at the Fair with pianists Jane Parker and Ronald Young of the Trinity College of Music, London

From the manufacturers' point of view it is obvious that all their equipment will be demonstrated under the most advantageous possible conditions. It costs a great deal of money to exhibit at the Russell Hotel, and every firm naturally wishes to show its products in the best possible light. In theory the visitor should be able to walk from room to room and form opinions based on comparison. In practice this is almost impossible.

Remember that whatever equipment is being demonstrated, whether it be a tape recorder, a gramophone transcription unit, a pick-up cartridge or a microphone it will be judged by the sound heard at the loudspeaker. All too often the demonstration is more a comment on the loudspeaker than on the associated equipment. It would only be possible to overcome this problem if all exhibitors were to use the same make and type loudspeaker equipment; even then the differing acoustics in the listening rooms would still cloud the issue. For obvious reasons this just can't be done, but it's the first thing to bear in mind when walking from room to room.

Since most of us will be interested in the Fair from a recording point of view we shall be paying special attention to the demonstrations of recorders, microphones and tape. In the demonstration of a tape recorder it is not sufficient to merely hear music of uncertain origin being reproduced. I would want to hear recordings that have actually been made on that kind of equipment—preferably live recordings at that. Too often the visitor is so thrilled with the sound that he forgets to investigate the elementary functioning

Please turn to page 141

631

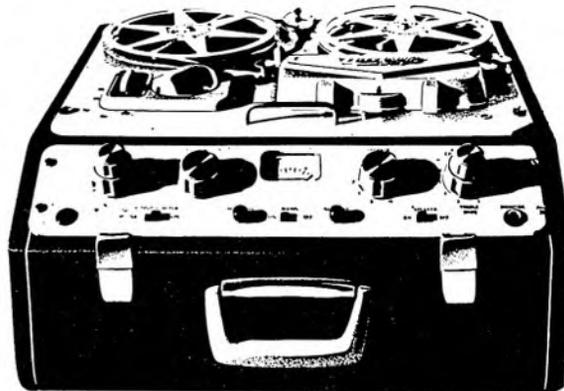
the incomparable

Ferrograph

The Ferrograph is truly British, built affectionately with finely engineered components mostly of our own manufacture and containing only 2% imported materials. Every component is part of the Ferrograph master plan to make high fidelity in recording an enduring quality. You'll enjoy moving up into the Ferrograph class.

MODEL 631. Mono recorder/reproducer with additional plug-in head position for stereo playback of pre-recorded tapes, monitoring and other purposes. 95 gns.

Other models: 632 126 gns., 633 120 gns., 634 132 gns. All models available with alternative teak sides for in-building.



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Please let me have full details of Ferrograph Tape Recorders,

Name _____

Address _____



TM 9

Continued from page 138

The transistorised battery portable recorder model L4, will again be on show, but this year a version with a synch pulse facility for cine application will be available.

Other E.M.I. products, recording tape, tape records, and accessories will be displayed and qualified staff will be only too pleased to answer visitors' inquiries.

* * *

FANE (Stand 21, Demonstration Room 113).

Fane Acoustics Limited, Hick Lane, Batley, Yorkshire. Batley 2114.

The principal item in the Fane demonstration will be the new loudspeaker assembly, model 604. Using the Ionic high frequency unit, the Ionofane, the 604 is housed in a teak veneered cabinet measuring 31 x 17 x 12 in. The Ionofane itself is mounted in a well-ventilated compartment at the top of the cabinet, below which is a new 12 in. unit in a sealed enclosure. Full details of this unit were given in our New Products section last month.

Fane have given a special treatment to the conventional type cone of the new 12 in. unit which is said to result in a true piston action throughout the middle frequencies without break-up or colouration. A level response is claimed up to 15 kHz. It is said that listening to good stereo records in a normal living room it is easier than ever before to forget the speaker altogether.

* * *

FEDERATION OF BRITISH TAPE RECORDING CLUBS (Room 344).

Federation of British Tape Recording Clubs, 33, Fairlawnes, Maldon Road, Wallington, Surrey. Franklyn 2982.

Having their own room at the Fair this year, Federation officials will be available to talk to all visitors on topics of mutual interest. They would particularly like to contact members of existing recording clubs, and also any enthusiasts who might be considering forming a club in their own locality in the future.

The Federation will also have available details of the next British Amateur Tape Recording Contest, and it is hoped that all visitors will call at Room 344 to obtain their entry forms.

* * *

FERRANTI (Stand 59, Demonstration Room 120).

Ferranti Limited, Gem Mill, Oldham, Lancashire. Tel.: Main 6661.

The applications laboratory of the Ferranti Electronics Department will be exhibiting and demonstrating audio equipment using silicon planar transistors which permit flexibility of design not always available with germanium devices. A comprehensive book of audio circuits of interest to both professional and amateur high fidelity enthusiasts will be available.

* * *

FERROGRAPH (Stand 38, Demonstration Room 134).

The Ferrograph Co. Ltd., 84 Blackfriars Road, London, S.E.1. Waterloo 1981.

The main items of the Ferrograph display will comprise the 631, 632, 633, and 634 tape recorders, together with high speed and teak sided versions of these instruments. All are quality machines to the highest Ferrograph standards.

The teak sided models are an interesting development designed to meet the demand for either building into an existing cabinet or for free standing "unit hi-fi" applications. The high speeded versions omit the

low speed of 1½ ips but include for top quality work the professional speed of 15 ips.

Continuous monitoring off the tape, echo effects and multiplex are available on the half-track model 632. Model 634 has a similar specification but 4-track operation with provision to adjust replay head to replay half-track stereo tapes.

All machines have the well-known Ferrograph features, including synchronous capstan motor, azimuth adjustment of record/playback head by a single screw, illuminated record level meter, pause control, angled tape indexing counter, etc., etc.

* * *

FIDELA (Stand 24).

Denham & Morley Limited, Denmore House, 173/175, Cleveland Street, W.1. Euston 3656.

A number of items in the Fidela range of tape recorders are said to be of professional quality with a claimed frequency response of from 30 to 22,000 Hz. All operating on four tracks, they are suitable for horizontal or vertical operation. Model 707 incorporates three heads, has separate record and playback amplifiers and three speeds, yet measures only 11½ x 8½ x 6 inches and weighs 16 lb.

On Stand 24 we shall also see fully transistorised stereo amplifiers with a claimed power output of up to 110 watts and response from 20 to 35,000 Hz ± 1 dB, and cabinet loudspeakers of attractive design and performance.

* * *

FISHER (Stand d, Demonstration Room 115, Office 116).

Getz Bros. & Co. Inc., 2 Harewood Place, London, W.1. Grosvenor 6901-5.

As one of the most prominent American manufacturers of high fidelity equipment, Fisher will be showing a complete range of reproducing systems. These will include the 700-T 120 watt solid state FM stereo receiver with field effect transistors. This equipment, selling at 239 guineas, is said to incorporate every known and desirable engineering advancement in transistor design. The control panel features a 24 carat gold plated casting with contrasting walnut texture and anodised panel sections. The Fisher Stereo Beacon automatically signals a stereo broadcast and also automatically switches to or from the mono or stereo mode.

At the lower price of 173 guineas is the Fisher 220-T 55 watt AM/FM stereo receiver also with field effect transistor circuitry. Incorporating a full range of facilities, including an "after record" monitor switch, it measures only 15½ in. wide, 4 13/16 in. high and 11 in. deep. Also on show will be a wide range of loudspeaker systems.

* * *

FERGUSON (Stand 20, Demonstration Room 222).

British Radio Corporation Limited, 284, Southbury Road, Enfield, Middlesex. Howard 2477.

Ferguson "Unit Audio," as it is called, will comprise the main exhibit. Unit Audio consists of completely separate items of audio equipment, specially designed to offer the most versatile facilities for interconnection and also to match in style and finish. Amongst the items available in this series is an integrated tuner stereo amplifier, a record player unit, a floor standing speaker unit, a shelf mounted speaker unit, and a 3-speed, four-track tape recorder. A stereo amplifier is also available without tuner for use with an existing tuner or radio receiver.

All the units are sold separately and enable the user to build up a whole series of variations for radio reproduction and mono and stereo record reproduction. Stereo tape can be reproduced with the addition of the Thorn TA/01 Syncroamp unit. From the selection of six basic units 26 combinations are possible. Design consistency will be maintained for several years so that users will be able to obtain other matching units if they wish to extend their installation in the future.

* * *

GARRARD (Stand 48, Demonstration Room 247, Office 250 and 251).

Garrard Engineering Limited, Newcastle Street, Swindon. Swindon 5381.

A number of new models will be displayed and demonstrated by Garrard. The Mk II Series of gramophone transcription units embody many new features.

The Mk II version of the well-known LAB80 has an automatic play facility for single records, together with a record repeat adaptor which allows a disc to be repeated as often as required.

Model AT60 Mk II now has a cueing and pause control allowing the pick-up arm to be lowered on to a record at any position, reducing the possibility of damage to either record or stylus. The pause facility can be used at any point while playing a stack of records and will hold the pick-up arm above a record until resumption of playing is desired. An easy setting stylus force adjustment is provided by means of a calibrated rotating knob control.

Model SB25 has been designed to meet the demand for high quality, single record playing unit at moderate cost. The loaded turntable is provided with a mat fitted with a brushed aluminium trim ring and an integral cueing device is included. Model 3000 features a low mass tubular pick-up arm designed for use with high compliance pick-up cartridges.

These and many other models can be seen and heard in Room 247.

* * *

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

Goldring Manufacturing Co. (Gt. Britain) Ltd., 486/488 High Road, Leytonstone, London, E.11. Leytonstone 8343.

The full range of Goldring/Lenco transcription turntable units will be on show, all featuring infinitely variable speed adjustment. These famous units can now be supplied complete in attractive cabinets.

Goldring pick-up cartridges will be both shown and demonstrated, and it is hoped that several new items will be ready for showing to the public for the very first time.

* * *

GOODMANS (Stand 49, Demonstration Room 434, Office 405, Extra Rooms 432/433).

Goodman Industries Limited, Axiom Works, Lancelot Road, Wembley, Middlesex. Wembley 1200.

New at the festival and on demonstration in room 434 will be the Goodman's high fidelity AM/FM stereo tuner, Stereomax. Designed to complement the Maxamp 30 in performance, styling and technical excellence, Stereomax is only 10½ x 5½ x 7½ in. deep. Finishes available are teak or walnut to order. The polished wood cabinets are particularly suitable for unobtrusive shelf mounting. If flush panel mounting is preferred the cabinets are easily removable.

Maxamp 30, the first British, all-silicon, transistorised stereo hi-fi amplifier, will be demonstrated together with the famous

Please turn to page 142

of the machine. Imagine yourself taking this recorder out on a recording job or using it within your own home. Are the controls accessible? What type of plugs and sockets are used, are they sensible connectors or nasty little miniatures that will give rise to endless trouble? Are all the facilities required available on this particular machine? What is the power and impedance at the external speaker sockets? But above all else, is it a machine that one could feel happy about using under practical recording conditions?

If it is difficult to form a judgment about tape recorders, then it is even more difficult when we come to consider microphones. The proof of the pudding is very much in the eating. Even the most experienced professional can form no opinion about a microphone by merely looking at it; he can get some idea by carefully studying the specification, but what he really wants is to hear the actual results it will produce.

In this respect our sympathy must go out to the microphone manufacturers, because this is a very difficult demonstration to arrange. At least one firm is going the whole hog and recording live in his demonstration room at the Fair so that visitors can make an immediate comparison between the actual and reproduced sound. All congratulations to this company for arranging such an imaginative demonstration. It takes courage to do that, because such demonstrations are notorious for going wrong; this would not be a reflection on the equipment but the result of the appalling difficulties under which the engineering staff will have to work.

Do also pay particular attention to other demonstrations where live recordings taken using microphone equipment over a broad price range can be heard. This is a wonderful opportunity to form one's own conclusions as to the variation in quality that might be expected at different price levels. You might be surprised to note how closely modern microphones in the £10 to £15 group do approach, in terms of quality, to other models costing nearly ten times as much.

Demonstrating the qualities of recording tape is probably one of the most difficult tasks of all. How is a manufacturer to show that his tape has any advantage over a competitor's?

There has recently been a tendency amongst the larger manufacturers to produce tape having roughly the same bias requirement. This simplifies matters enormously as tape recorder manufacturers (who want their own equipment to be used under the best possible conditions) will be inclined to set bias values to suit the general average level.

Too often we tend to buy one particular brand of tape for no other reason than it is the kind that we have always used. Try shopping around a little to find out just what the different manufacturers are offering. A change of tape *could* produce a dramatic quality improvement, and so it might be well worth trying.

None of us would record anything at all if it were not for the sound that we anticipate hearing. So last of all we have to form some opinion about loudspeakers. The layman might imagine that having heard sound reproduced in one room he could then walk down the corridor into another demonstration and form some sensible conclusion as to the comparison between the two. Unfortunately this is not true; the ear very quickly accepts the sound presented to it, and the sound just heard is forgotten within seconds. You know how difficult it is to precisely remember a particular shade of colour; it is as equally difficult to remember sound quality.

It is easier to say what we don't want from a loudspeaker than what we do. We don't want "screeching hi-fi." This is a hard, false brilliance to the high frequency content that at one time passed for true high fidelity reproduction. In fact it is so unpleasant as to quickly tire the listener. If you find yourself suffering from "listener fatigue" you can bet your life there's something wrong with the speaker producing the sound.

A good quality speaker will produce a melodious sound quality that imposes no strain at all on the listener. Note the small differences between various models of the same make. Note how quickly those differences tend to be forgotten. Go from room to room, doubling back on your tracks if necessary, to confirm your conclusions. Finally, do remember that what matters is how a loudspeaker will sound under operating conditions in your own home—this may be very different to the impression received under the necessarily false conditions of the Audio Fair.

If, as you walk away from the Fair, you are left with a feeling that good quality sound is only for millionaires and that your own equipment should be dumped in the dustbin, then your pilgrimage will have been in vain. Maligned though the term might be, hi-fi is as necessary a part of modern living as television, refrigerators and motor cars. Without it one is missing one of the greatest benefits of modern civilised life. Use the Fair to assess your own level of interest; keep your feet firmly on the ground and don't be ashamed to admit to modest needs. But above all enjoy the world's finest audio exhibition.

632

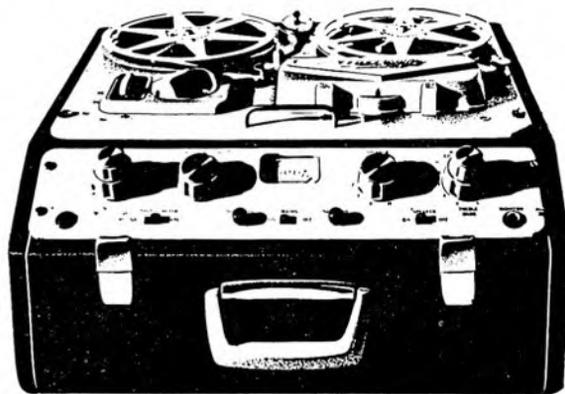
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Ferrograph

The Ferrograph is an instrument of impressive excellence—impressive in the high quality of its recording, and in its reliability through years of exacting use. That's the way we build it. The way we always have built it! You'll enjoy moving up into the Ferrograph class.

MODEL 632. Stereophonic, with separate record, replay heads and amplifier systems (2 record amplifiers and 2 playback pre-amplifiers) and an output monitor stage with built-in speaker. 126 gns.

Other models: 631 95 gns., 633 120 gns., 634 132 gns. All models available with alternative teak sides for in-building.



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Name _____	
Address _____	

Continued from page 140

Goodman M range loudspeaker systems. The baby Maxim was the first tiny loudspeaker system to give true, high fidelity reproduction. Also in the range is the Magnum 3 studio quality reproducer, and the Mezzo 2, the up-to-the-minute bookcase speaker system incorporating several new refinements, among them a flush fitted attenuator allowing fine adjustments to suit the individual requirements of both the listener and the listening room.

In room 433 the Goodman products will be shown arranged in an attractive domestic setting to demonstrate how handsome and compact hi-fi of to-day really can be.

* * *

THE GRAMOPHONE (Lounge 153).

General Gramophone Publications Ltd.,
739, Kenton Road, Harrow, Middx.
Wordsworth 2010.

* * *

GRAMPIAN (Stand 58, Demonstration Room 151).

Grampian Reproducers Ltd., Hanworth
Trading Estate, Feltham, Middx.
Feltham 2657.

Manufacturing an extremely wide range of audio equipment, Grampian will be showing microphones, together with stands and accessories, mixers, amplifiers, speakers and, of course, the well known Reverberation and Ambiphonic units.

The Ambiphonic unit is designed to "tailor" the acoustics of any listening room to suit the requirements of the music being reproduced. With its help we can change the resonance of the room at will, simulating at one time the feeling of the concert hall at the next the reverberant conditions of a cathedral.

* * *

GRUNDIG (Stand 19, Demonstration Room 534, Office 533).

Grundig (Gt. Britain) Ltd., Newlands
Park, Sydenham, London, S.E.26. Syd-
enham 2211.

Grundig are exhibiting a wide range of high quality tape recorders, audio and hi-fi equipment. Pioneers in the tape recorder industry, Grundig now introduce the first automatic stereophonic tape recorder, the TK245. This is a two speed, four-track machine with both an automatic and manual record level control. Mechanically similar is the two-track TK220, also on show for the first time.



Grundig TK245

In addition to these two new items the entire series of Grundig machines will be on show, from the studio class, fully stereophonic TK340 and TS340 to the C100 battery-operated, and the C110 mains-operated, cassette recorders.

Pride of place in the Grundig demonstrations will be given to the fine new range of audio and hi-fi equipment recently introduced. This includes the SV80 and SV40

integrated stereo pre-amplifiers and power amplifiers, both fully transistorised, mains powered and with transformerless output stages. The RT40 tuner unit, specially designed to work in conjunction with either of these amplifiers, will also be a feature of the demonstrations. Of particular interest to those with limited space will be the Studio 40M and the Studio 80 control consoles incorporating a tuner unit, amplifier and transcription auto-changer attractively contained in a compact, contemporary cabinet in natural matt or oiled teak finish. There will also be a wide choice of loudspeaker combinations to give the highest quality stereo sound reproduction to suit all acoustic conditions and every type of room design.

* * *

HI-FI NEWS/TAPE RECORDER (Stand 35, Lounge 152).

Link House Publications Ltd., Link House,
Dingwall Avenue, Croydon, Surrey.
Municipal 2599.

* * *

HIGH FIDELITY MAGAZINE (Stand 60).

Billboard Publishing Co., 7, Welbeck
Street, W.1. 01-486 5971.

* * *

HMV (Stand 27).

British Radio Corporation Limited, 284,
Southbury Road, Enfield, Middlesex.
Howard 2477.

Labelled "the most deceptive piece of stereo equipment ever made," the HMV Stereomaster Series of record playing equipment will be on show on Stand 27. Model 2026, which includes four built-in speakers, costs 59 guineas plus 17s. 2d. purchase tax surcharge, and model 2328, which includes VHF radio, is 69 guineas plus 20s. purchase tax surcharge.

* * *

JORDAN-WATTS (Stand 25, Demonstration Room 221).

Boosey & Hawkes (Sales) Limited,
Sonorous Works, Deansbrook Road,
Edgware, Middlesex. 01-952 7711.

The basis of the Jordan-Watts' display and demonstrations will be the remarkable loudspeaker module, which is only 6 inches square. It is claimed to have a performance superior to complex multi-speaker systems and can be housed in an enclosure small enough to get into a briefcase.

This is the building brick for their well-known range of high fidelity loudspeaker systems, including infinite baffle, reflex, folded column, folded horn, and line source types. It has also made practical the successful development of a compact sized, one-piece Stereophonic Loudspeaker system, the Jordan-Watts' Stereola, being demonstrated for the first time.

This model makes use of both directional and omni-directional loudspeaker properties to achieve a room filling, mobile, stereophonic effect. In order to demonstrate this, a continuous programme will be provided enabling visitors to move about in the demonstration room and to hear the Stereola from several positions.

On the stand will be examples of the Jordan-Watts range high fidelity systems, together with the module itself, which can of course be purchased separately by the home constructor.

* * *

KEF (Stand 31, Demonstration Room 442, Office 443/444).

KEF Electronics Limited, Tovil, Maid-
stone, Kent. Maidstone 58361.

New items within the KEF range of

loudspeakers will include the Carlton three-way system of professional quality, based on a mid-range unit of fundamentally different design, and the Cresta ultra-compact, two-way system.



KEF Cresta

The Carlton has been developed to meet the critical requirements of the middle frequency range from 250 to 4,000 Hz. It is claimed that over these four octaves the ear can detect differences of less than 1 dB between two loudspeakers, as well as quite small amounts of colouration. For this reason a completely new M70 mid-range unit, utilising a 2 1/4-inch diameter hemispherical diaphragm made from Acoustilene, was evolved. Coupled with the new T27 tweeter the range is extended right up to 30,000 Hz without directional effects to produce realistic, fatigue-free, reproduction of an exceptionally high standard. The woofer is an up-dated version of the well-known B1814. Every Carlton is specially tested and individually auditioned to ensure agreement with a master sample.

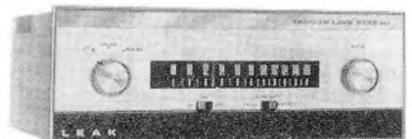
The Cresta is regarded as a significant step forward in ultra-compact systems, since it is claimed to cover the full frequency range with low distortion and achieve superior balance in a diminutive cabinet.

* * *

LEAK (Stand 34, Demonstration Rooms 347, 348).

H. J. Leak & Co. Limited, Brunel Road,
Westway Factory Estate, London, W.3.
Shepherds Bush 1173.

New at the Audio Fair will be the Trough Line Stereo Tuner. Designed to enable listeners to obtain first-class reception of FM stereo broadcasts, the dimensions and basic design are those of the Trough Line 3 Tuner but with the addition of a transistorised decoder built into the chassis, and manual switching for stereo or mono operation. The cost will be £39 10s. plus purchase tax £7 12s. 1d.



Leak Trough Line Stereo.

As a logical progression from the famous Leak Sandwich speaker, the Mini-sandwich will be shown for the first time. The design objective was to produce a superlative, small loudspeaker for those who cannot spare the space for the standard Sandwich. Virtually a smaller replica of the larger

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TECHNIQUES

DENYS KILLICK ON QUALITY

LAST month we dealt with the originality of a recording; this month we deal with an equally elusive attribute, that of quality. The concept of originality is so abstract as to be difficult to discuss in concrete terms, whereas quality is something about which we can be more definite.

First of all, what is meant by quality in a recording? I hope I will be forgiven by the Acoustical Manufacturing Company Limited, of Huntingdon, if I quote the phrase they attach to their Quad equipment: "The closest approach to the original sound." In this very clever sales phrase they admit a fundamental truth—exact and precise reproduction of the original sound is just not possible. So I would like to equate quality with "the closest approach to the original."

Now it is at this very point that the recording and Hi-fi enthusiasts' different points of view merge into one single objective. The only further difference between them is that the Hi-fi man will be content to merely reproduce commercial recordings, whereas we take pride in producing the recordings ourselves.

But having referred to the original sound as a yardstick by which to measure the quality of a recording, we at once meet an insuperable difficulty. How are we to judge precisely the quality of original sound, since the recording might have been taken in Paris, New York, Berlin or any other city? And, furthermore, upon what basis do we form an opinion? We must be very careful indeed not to think only in terms of the recording without taking into account the reproducing equipment. The same recording reproduced under different circumstances with different chains of playback equipment can undergo vast changes. So any assessment of quality must always be related to the playback equipment used.

Let us assume an interest in orchestral work. As we have just pointed out, direct comparisons between recorded and original sound are virtually impossible. So what do we do? The answer, I am afraid, is to stop reading specifications of equipment and to start going as frequently as possible to concert halls. Since direct comparison between original and recorded sound is not possible, a sensible judgment can only be formed by the cultivation of an "educated ear." In other words a considerable experience of listening to live sound is the only way of forming any intelligent judgment basis for the critical listening to recorded sound.

To get the best quality from radio transmissions one must have some means of receiving the VHF frequency modulated broadcasts. Although a number of conventional radio sets equipped for reception of the VHF band are now readily available, these are likely to be inferior in terms of quality, to the specially designed Hi-fi tuning units that have been developed for audio enthusiasts.

Radio tuners can be bought within the very broad price range of from approximately £15 to approximately £100. We need from a tuner a strong, clean, undistorted signal. We also need freedom from "drift". Some VHF receiver circuits tune in strongly to the station, but after a short time the broadcast literally drifts out of tune. This results in a sharp increase in background noise and a marked deterioration in frequency response.

VHF is described by the BBC as "noise free" radio. This, like many other commercial statements, is not quite true. Under ideal conditions of reception a VHF broadcast will contain only a suggestion of background hiss and no other noise at all. Under less ideal conditions, which might be caused either by the inadequacy of the receiving tuner unit, the inadequacy of the receiving aerial or even by the geographic position of your home in relation to the nearest VHF transmitter, background noise is liable to increase considerably. VHF is notoriously susceptible to interference produced by aircraft flying overhead, which is heard as a drifting of the signal, and the irritating tick-tick-tick of unsuppressed ignition from passing motor vehicles. In both cases the better quality tuners will suffer less because their circuitry enables them to lock on to a station, to hold that station at constant strength, and to reject all signals that are not precisely on that wave-length.

The commonest form of dissatisfaction with VHF reception is almost certainly due to using a poor aerial. This arises because almost any piece of wire plugged into the aerial socket will give reception of a sort. If an indoor aerial is used the signal is likely to come and go like a yo-yo as people move about in the room. This is hopeless for quality recording. Consult an aerial specialist and have a proper roof aerial fixed. The type and design will depend upon the location of the house.

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B33

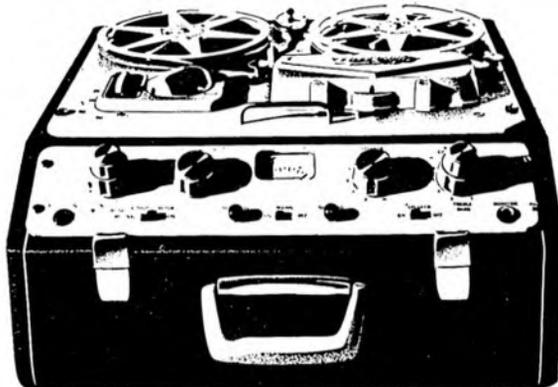
the incomparable

Ferrograph

We have never claimed perfection for the Ferrograph, but we believe it comes nearest of all to the unattainable. Superbly engineered, with a specification that will withstand any test or evaluation, the Ferrograph adds enduring reliability to faithful recording. **You'll enjoy moving up into the Ferrograph class.**

MODEL 633. A monophonic recorder made, in limited numbers, for the connoisseur and professional. Guaranteed for 3 years and carrying a test certificate covering all important specification measurements. 120 gns.

Other models: 631 95 gns., 632 126 gns., 634 132 gns. All models available with alternative teak sides for in-building.



Newport, Mon:

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GWENT AUDIO LIMITED

153 Commercial Road, Newport.

Free demonstration in your home without obligation.

The coupon will bring you details of all models.

GWENT AUDIO LIMITED

153 Commercial Road, Newport, Mon.

Please let me have full details
of Ferrograph Tape Recorders.

Name _____

Address _____



Continued from page 142

model, the performance is said to be indistinguishable except for the lowest octave. Retail price £27 10s.

For the convenience of visitors demonstrations have been arranged in two rooms. In room 347 the Trough Line Stereo Tuner, the Leak Stereo Pick-up, and Stereo 30 Transistor Integrated Amplifier—will be demonstrated with the Sandwich loudspeakers. In room 348 the same basic equipment can be heard using the Mini-sandwich loudspeakers.

* * *

LINEAR (Stand 19a).

Linear Products Ltd., Electron Works, Armley, Leeds. Leeds 630126.

* * *

LOWTHER (Stand h, Demonstration Rooms 404 & 439, Office 440).

Lowther Manufacturing Co., Lowther House, St. Marks Road, Bromley, Kent. Ravensbourne 5225.

Following the pattern of previous years, Lowther will be offering a continuous demonstration which will allow visitors to assess the comparative qualities of their different speaker enclosures. Pride of place will go to the Corner Reproducer T.P.1, a unit which has established itself over the years as being second to none. Interesting comparisons can be made with the Audio-vector and Acousta enclosures and the very original Acousta Twin which is said to reverse the accepted Blumlein principle for stereophonic recordings. This one-piece stereo reproducer allows the listener complete freedom of position without imposing false directional effects.

The complete range of Lowther amplifiers, tuners and associated Hi-Fi equipment will also be on show, and qualified staff will be available to advise visitors.

* * *

LUGTON & CO. (Lounge 246).

Lugton & Co. Ltd., 209-212, Tottenham Court Road, London, W.1. Museum 3261.

Lugton & Co. Ltd. will be pleased to welcome their trade customers in Room 246 where specialised staff will be available to assist and advise.

* * *

LUSTRAPHONE (Stand 15, Demonstration Room 342).

Lustraphone Limited, St. George's Works, Regent's Park Road, London, N.W.1. Primrose 8844.

British in both design and manufacture, the Lustraphone range of microphones, instruments, stands and numerous accessories are built to a high degree of operational efficiency. The latest developments will be on show, including the "Radiomic" System which comprises a Transistorised Transmitter, a Transistorised Receiver, and a Lavalier Microphone. The system permits lecturers, speakers and artists to move freely among audiences without the encumbrance of long, trailing cables.

As with other electronic equipment, miniaturisation of microphones is now regarded as important. Consequently Lustraphone now produce a complete new range based on the model VR70/I, sub-miniature, ultra-lightweight, ribbon unit, the first of its kind employing ceramic magnets. Only 1½ inches long and weighing ¾ oz. it will be available in five different models to cover a wide range of application.

M. B. MIKROFONBAU (Stand 37, Demonstration Room 217, Office 223).

Denham & Morley Limited, Denmore House, 173/175, Cleveland Street, W.1. Euston 3656.

Manufactured in West Germany, the M.B. range of ribbon and moving coil microphones are suitable for broadcasting, recording studio, public address and domestic applications. Gaining increasing popularity on the Continent amongst professionals and amateurs alike, the directional characteristics of these microphones suit them to many diverse uses.

M.B. mono or stereo headsets will be on show, with or without boom microphones, together with telescopic floor stands, table stands and accessories.

* * *

MINICONIC (Stand 17).

A. C. Farnell Limited, 81, Kirkstall Road, Leeds 3. Leeds 35111.

The Miniconic pick-up cartridge involves one of the most drastic innovations of operating principle to have been seen for many years. Silicon semi-conductor elements are used within the cartridge construction permitting a radical reduction in the mass of the moving system; thus stylus groove contact is maintained under severe conditions. The advantages are said to be smooth, wide range music reproduction with unparalleled transient response—clean, clear highs and lows all the way down to 1 Hz!

* * *

MULLARD (Demonstration Room 211, Office 209).

Mullard Limited, Mullard House, Torrington Place, London, W.C.1. 01-580-6633.

Mullard Limited will be pleased to welcome trade visitors to their suite (rooms 209/211) on the first floor. Here the company's latest semiconductors, valves and passive components for use in audio equipment will be displayed, together with circuit design information for hi-fi equipment, tape recorders and public address amplifiers.

* * *

ORTOFON (Stand 22, Demonstration Room 117).

Metro-Sound (Sales) Limited, Bridge Works, Wallace Road, Canonbury, London, N.1. Canonbury 8641.

Last year the S15 Series Ortofon cartridges was introduced for the first time. The research and technological developments resulting in the production of that model has made it possible to further improve the already established SPU Series, resulting in even better performance at a lower price.

Ortofon pick-up arms cater for all possible requirements, and the introduction of a newly-styled SMG212 with bias adjuster enhances the range still further. In Room 117 the Ortofon loudspeaker, noted for its outstanding quality of reproduction, will be demonstrated.

* * *

PARMEKO (Stand 51, Demonstration Room 219, Office 224).

Parmeko Ltd., Percy Road, Aylestone Park, Leicester. Leicester 32287.

* * *

PHILIPS (Stand 10, Demonstration Room 336, Joint Display Room 337).

Philips Hi-Fi Limited, Century House, Shaftesbury Avenue, W.C.2. Gerrard 7777.

Philips Audio Plan, styled with the "Furniture Look" to match Philips tape recor-

ders, is being nationally introduced at the Fair.

The units, all in natural teak cabinets with black and silver trim, include three record players, three amplifiers, three tuner units, one integrated tuner amplifier and four types of loudspeaker enclosures. Impedances and sensitivities are compatible throughout, and as all units are supplied with interconnecting leads and plugs ready wired a complete system can be built up, stage by stage, to suit the user's personal needs. Either spool-to spool or cassette type recorders can be used with all the equipment.

Audio Plan systems, from the simplest costing less than 60 guineas to more advanced combinations up to £240, will be demonstrated in Room 336 and will be on display together with Philips tape recorders in Room 337.

* * *

PHILIPS (Stand 11, Demonstration Room 335).

Philips Electrical Ltd., Century House, Shaftesbury Avenue, W.C.2. Gerrard 7777.

Several new tape recorders will be introduced at the Fair for the first time, and these will all be in the new Philips styling, having a black finish with silver trim and teak cabinets for the standard models.

Of particular interest is the 3302, a new battery portable cassette machine with external speaker socket and 4200, a new upright battery portable. Many accessories will be on show, including a slide synch. unit, E.L. 1995, which operates on six U 11 batteries and a mains supply unit costing £5 12s., the EL 1998, designed to give 7½ or 9 volts from AC mains.

* * *

PIONEER (Stand g, Demonstration Room 111).

Swisstone Ltd., 26, Leigh Place, Cobham, Surrey. Cobham 4214.

* * *

QUAD (Stand 67, Demonstration Room 504, Office 540).

Acoustical Manufacturing Co., Ltd., St. Peter's Road, Huntingdon, Hunts. Huntingdon 2561.

The entire range of Quad domestic equipment will be shown and demonstrated. Manufactured in their own works at Huntingdon, Quad equipment has long been accepted as synonymous with quality. The products will include Quad amplifiers, the famous Quad Electrostatic Speaker, Quad tuners in both AM and FM models, and multiplex decoders. Demonstrations, each lasting about 15 minutes, will be held at regular intervals in room 504 and qualified staff will be pleased to answer all inquiries both there and on Stand 67.

* * *

RADFORD (Stand f, Demonstration Room 448).

Radford Electronics Limited, Ashton Vale Estate, Bristol, 3. Bristol 662301.

* * *

RECORD HOUSING (Stand 62, Demonstration Room 140).

N. & S. B. Field & Co. Ltd., Brook Road, N.22. Bowes Park 7487.

Please turn to page 146

Look at radio tuners in the same way as you should regard all other items of Hi-fi equipment; don't go for the cheapest, congratulating yourself upon how much you have saved; don't go for the dearest under the impression that it must be best. There are a few firms in this field who have established enviable reputations for excellent quality products. Start your investigations with them.

Having acquired a good quality tuner the only other piece of equipment needed to take a recording is the tape recorder itself. If quality is the only consideration, what equipment should we use and how should we use it? If we were to answer that question literally we could say, without fear of contradiction, the finest recorder available, the fastest speed and the very best tape. In practice this is just not possible. The machine we use will probably be the machine we already own. To get the best possible quality out of it we should start off by considering the recording tape itself.

Advice has been given in these pages in the past about methods of investigating different kinds or brands of tape to select those that are most suited to individual machines. I cannot stress too strongly the specific relationship between the record head and the tape which is going to pass over it. With some kinds of tape widely differing bias values will result in widely differing standards of quality. This has nothing whatever to do with intrinsic value, but everything to do with the magnetic properties of the oxide on the tape. I am completely in favour of using low-cost tape for creative experiment—one can chop away with a razor blade without feeling that pound notes are being carved up. But for quality work only the best tape is admissible.

Next we consider the matching of the output of the tuner to the appropriate input on the recorder. Most recorders have an input labelled radio, tuner, pick-up or diode. The first requirement is to match in terms of sensitivity, so that the recorder can be comfortably operated with the record level control in a fairly central, or even rather less than central, position. Too much output from the tuner will result in premature overload of the record amplifier before the gain control has been advanced very far; too little output would need recording at maximum, or near maximum, level to obtain an adequate signal. In the latter case the resultant recording is likely to be spoiled by the increase in background noise from the recorder amplifier, and in the former distortion will almost certainly occur on the peaks.

Tactfully I have refrained from saying anything at all about the recorder itself! Perhaps that is cheating. I am old-fashioned enough to believe in recording full-track at 15 ips. Quite honestly only a few fanatics would agree. With the increasing popularity of stereo we are seeing more and more quarter-track machines on the market. We have now reached the stage where some quarter-track machines are capable of giving better quality than older half-track models. It doesn't alter the fact that a good half-track is always better than a good quarter-track. The wider the track the better will be the signal-to-noise ratio. The wider the track the less will be the danger of drop-outs. And last but not least the wider the track the easier it will be to find any given recording on a length of tape.

Lastly we must relate quality to live recording. Here we find ourselves treading on very dangerous ground. Most tape recorders are capable of recording within a reasonably wide frequency range. This frequency range is all too often beyond the scope of the microphone.

If you could take any medium-priced machine—say in the £50 price bracket—and couple a top quality microphone to it, you would be amazed at the improvement in quality. Naturally, the over-all quality would not be quite so good as it would have been if we had used a more professional recorder; nevertheless, whatever the quality standard of the recording equipment the old adage holds good; "You won't get out any better quality than you put in."

If I may borrow another advertiser's slogan (these sales people are so good at saying just the right thing in just the right way) one firm has adopted as its caption; "Your tape recorder is only as good as your microphone." When recording live this is the whole crux of the matter. I have no patience at all with people who invest about £100 in a tape recorder, use a cheap microphone and then lose interest because of the poor quality of their live recording work. No photographer in his right mind would buy a Leica camera and expect to take good photographs using bottle glass instead of a lens.

We could easily write a book on the involved subject of quality in audio. Don't let the complexity frighten you; it all boils down to making sensible purchases of reliable equipment and using it in the most advantageous way. The more money you have to play with the better should be the end product, but even on a limited budget the right purchase of the right equipment will make all the difference in the world.

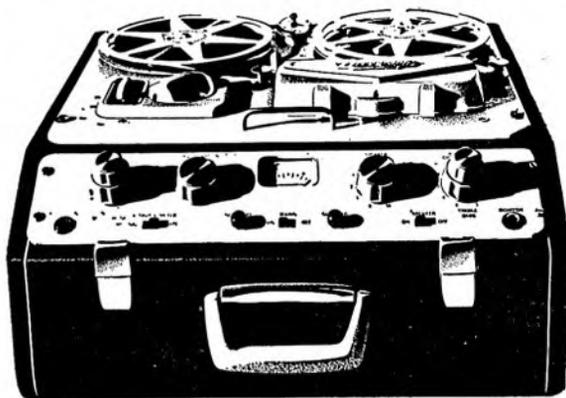
634

the incomparable

Ferrograph

For the true and serious amateurs of sound recording the Ferrograph is an instrument of outstanding excellence—not just for the exciting months when it is still new, but for many years to come. You'll enjoy moving up into the Ferrograph class.

MODEL 634 Facilities for twin quarter track recording and playback. Layout and controls similar to other stereo Ferrographs. 132 gns. Other models: 631 95 gns., 632 126 gns., 633 120 gns. All models available with alternative teak sides for in-building.



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See the World-renowned Ferrograph at:

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This coupon will bring you details of all models.

TOM MOLLAND LTD.
102 Cornwall Street, Plymouth.
Please let me have full details
of Ferrograph Tape Recorders

Name _____

Address _____



RADIONETTE (Stand 36).

Denham & Morley Limited, Denmore House, 173/175, Cleveland Street, W.1. Euston 3656.

A unique portable battery/mains recorder using only one 5-inch spool will be on show. Known as the Multicorder it provides up to 12 hours playing time, yet weighs only 6½ lb. Operating on four tracks it has two speeds, record level meter, 6 x 4 inch speaker, tone control and wooden cabinet. Frequency response is said to be up to 10,000 Hz, wow 0.2 per cent and output 1.3 watts. The cost is 49 guineas.

The Symfoni, a 5-waveband, 20 watt, stereo tuner amplifier will be shown, together with Duet, a mono tuner amplifier and other radio and radiogram equipment.

* * *

RECORDS & RECORDING (Stand 50).

Hansom Books Ltd., 16, Buckingham Palace Road, S.W.1. Victoria 3571.

* * *

RECTAVOX (Stand 13, Demonstration Room 349).

The Rectavox Co., Central Buildings, Station Road, Wallsend, Northumberland. Wallsend 624845.

Once seen, the design and shape of Rectavox loudspeakers is not likely to be forgotten. All visitors to the Fair are cordially invited to attend the demonstration in Room 349, after which the manufacturers are quite sure that the sound will be remembered equally as well as the shape!

* * *

REVOX-STUDER (Stand 42, Demonstration Room 118).

C. E. Hammond & Co. Ltd., 90, High Street, Eton, Windsor, Berks. Windsor 63388.

Revox tape recorders and the Hammond condenser microphone will be on show on the stand and an imaginative demonstration—details of which are top secret at the time of going to press—is planned for Room 118. Emphasis in the demonstration will be on what both the machine and the microphone can do under practical conditions.

Professional Studer equipment will also be on show, including the C 37 mono or stereo recorder. Costing just over £1,000 and weighing 172 lb., the speeds are 15 and 7½ ips. Amongst the many facilities on this very professional machine are built-in automatic scissors for editing and switchable equalisation for both C.C.I.R. and N.A.B.

* * *

ROGERS (Stand 38, Demonstration Room 402, Office 401).

Rogers Developments (Electronics) Limited, 4/14, Barmston Road, Catford, London, S.E.6. Hither Green 7424.

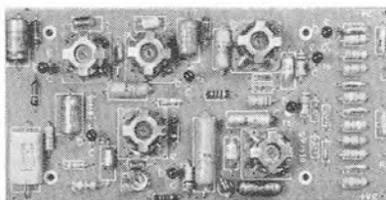
The complete Rogers range of stereo amplifiers and associated equipment will be on display. Demonstrations will be given from disc, tape and stereo radio.

The Cadet III is the most popular amplifier in the range, rated at 10 watts per channel with a range of input control facilities for home stereo systems. The HG88 III has 15 watts output per channel and a greater range of input and control facilities. Master II is a high-powered amplifier rated at 35 watts per channel, incorporating an advanced control unit featuring every conceivable facility designed for the discriminating enthusiast and the professional user.

FM tuning units, both switched and variable, will be demonstrated together with

the new Mk II stereo decoder. This is of advanced design and is capable of a very high standard of performance.

The wafer and compact speaker systems will be demonstrated in conjunction with the other audio equipment and a new 12-page colour leaflet will be available on request. Qualified staff will be pleased to answer problems and give advice relating to the use of Rogers equipment.



Rogers Decoder Printed Circuit Board, unpowered model

Rogers make a point of stating that the units used for demonstration and static displays are standard production models in every respect and have not in any way been modified or specially prepared for exhibition purposes. This also applies to the standard of wiring to be seen on the equipment used for static display.

* * *

SANSUI (Stand 73, Demonstration Room 314).

Technical Ceramics Limited, New Lane, Havant, Hampshire. Havant 6344.

We shall be seeing for the first time a complete range of Sansui products, designed for outstanding performance at low cost. There will be two types of stereo control amplifiers, an AM/FM multiplex tuner, an AM/FM stereo tuner amplifier and five different types of multiplex stereo tuner amplifiers including two solid state units. A hi-fi speaker system and stereo headphones set are also available. The model AU11 stereo control amplifier provides 40 watts power on each channel at .3 per cent distortion. Model AU70 has the same output. A noise component eliminator circuit built into model TU70 AM/FM multiplex tuner shuts out violent noises caused by motor ignition, television and other sources of interference. Other models offer delicate tuning facilities, super sensitivity and the elimination of hum and extraneous noise.

Model 3000 solid state AM/FM multiplex stereo tuner amplifier incorporates the latest output circuit for IHFM music power of 110 watts with harmonic distortion less than .8 per cent and a power band width from 20 to 20,000 Hertz.

* * *

SCOPETRONICS (Demonstration Room 363).

Scopetronics Limited, Crown Works, Church Road, Kingston-upon-Thames, Surrey. Kingston 4135.

This will be the second year that Scopetronics have exhibited, and once more they will be showing precision tape heads and tape transport systems. The Series 825 tape transport takes up to 8½-inch spools, employs three motors and mechanical wraparound, selfaligning brakes. The controls are interlocking and four head positions are available.

Series 1150 professional tape transport for ¼-inch tape takes up to 11½-inch spools. Designed for standard 19-inch rack mounting it has variable spooling, three motors and mechanical wraparound, selfaligning, fail-safe brakes. Stop and start is instan-

aneous. Three heads are mounted on interchangeable head bridges and loading is drop in.

Associated electronics for the 1150 transport system are also available. Comprising record drive amplifier and playback pre-amplifier, the equipment is provided with a peak programme meter for monitoring.

* * *

SCOTCH (Stand 23, Demonstration Room 242, Office 243).

Minnesota Mining & Manufacturing Co. Ltd., 3, M House, Wigmore Street, London, W.1. Hunter 5522.

On show for the first time will be the Scotch magnetic tape C60 Compact Cassette loaded with Superlife-coated tape which promises reduced oxide rub-off, improved frequency response and increased tape life.

Also on show will be the full range of low noise Dynarange Scotch magnetic tape, introduced for the first time at the 1966 Audio Fair. Coated with a unique low-noise oxide to reduce inherent background noise, Dynarange tape has been developed to bring recording even closer to original sound. There is a claimed improvement of signal-to-noise ratio of between three to five dB and a consequent increase in dynamic range. Clarity of reproduction, particularly in the critical high frequency area, is ensured by an improved frequency response.

A self-threading reel will be displayed in 5½-inch and 7-inch reel sizes. This reel, which utilises centrifugal force, grips the end of a length of tape, which is taken up smoothly, quickly and without wear.

The well-established Scotch magnetic tape will be shown, together with many accessories for the hi-fi enthusiast. Leatherette bound albums are available to solve storage problems, each being complete with one reel of tape and space for a second. Self-adhesive labels for easy spine and spool identification are included.

* * *

SENNHEISER (Stand 29, Demonstration Room 114).

Audio Engineering Limited, 33, Endell Street, London, W.C.2. Temple Bar 0033.

Once again Sennheiser Electronic will be exhibiting their full range of professional and domestic microphones of outstanding quality.



Sennheiser MD420 Close-talk Hypercardioid

The radio frequency transistorised condenser microphones which are so famous on the continent and in the USA have now been welcomed enthusiastically by broadcasting and film companies in Great Britain. Of particular interest is the condenser "gun" microphone, which is unique in being the only microphone in the world that combines the directional properties of a gun microphone with the superb quality of the condenser. A unique version of the RF condenser microphone is the MKH110 with a flat response from 0.1 Hertz to 20,000 Hertz. Obviously this is designed for scientific measurements rather than recording superlow bass!

New to the British market is the MD411 hypercardioid, dynamic microphone. Designed especially for domestic use, it sells at £13 9s.

Please turn to page 148



**You wouldn't teach Music
with an out-of-tune piano**

(So why use anything but Ilford Zonatape on your tape recorder?)

The tape recorder is fast becoming commonplace in many schools as a teaching aid. But a lot of schools, though they are very careful about what tape recorder they buy, don't seem to bother about the *tape*. They buy just any old stuff.

One tape—Ilford Zonatape—is, however, specially made for schools and anyone else who wants an utterly reliable tape. Not only specially made, but specially *tested*.

Next time you buy tape for your recorder, buy Ilford Zonatape.

ILFORD 

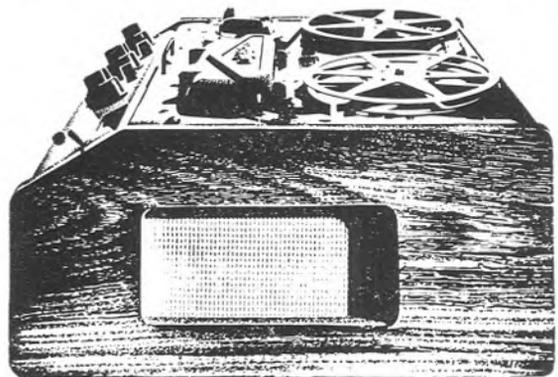
Ilford Limited, Motion Pictures & Magnetic Products Division
201-203 Wardour Street, London W.1. REGen 8731

The incomparable
Ferrograph
now with
teak trim

All Ferrograph tape recorders are available with a graceful and strong teak-sided housing. This pleasing variation from the standard finish—at no extra cost—is particularly suitable as a component in a hi-fi installation or free-standing as a complete unit.

You'll enjoy moving up into the Ferrograph class!

MODELS: 631 95 gns., 632 126 gns., 633 120 gns., 634 132 gns.



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For all Hi-Fi products—particularly Ferrograph.

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of Ferrograph Tape Recorders.

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TM 9



For the first time in Britain the Sennheiser range of audio test equipment will be on show, and in demonstration room 114 mono and stereo recordings made under domestic conditions with microphones such as the MD411, used in conjunction with a good domestic recorder, will be played back. These are described as "recordings that any amateur can obtain when using a microphone which matches the quality of his tape recorder."

SGS-FAIRCHILD (Stand 52, Demonstration Room 220, Office 226).

S. G. S. Fairchild Limited, Planar House, Walton Street, Aylesbury, Bucks. Aylesbury 5977.

SHURE (Stand 44, Demonstration Room 447, Office 446 and 462).

Shure Electronics Limited, 84, Blackfriars Road, London, S.E.1. Waterloo 6361.

The highlight of the Shure display will be the new V-15 Type II supertrack stereo cartridge, designed with the aid of an analogue computer following a detailed analysis of the characteristics of many high-level, stereo records. The V-15 II will track at a pressure of less than 1½ grams the highest recorded velocities likely to be encountered on a modern record, thus eliminating distortion due to imperfect tracking.

Also to be introduced is the M75 series, "Hi-Track" cartridges which provide high trackability at modest price.

New microphones, the Unisphere series, will also be on show. Based on the renowned Unidyne dynamic cardioid microphone, Unisphere models have a strong, built-in wire mesh spherical front that provides protection from wind and "pop" noises, and are thus particularly suitable for close speaking use.

SME (Stand 57).

SME Limited, Steyning, Sussex. Steyning 2228.

The well-known SME Series II precision pick-up arms and accessories will be on show. Since both arms continue to meet the requirements of the best present-day cartridges no changes have been made in their specification. Staff will be available on stand 57 to advise and assist.

SONOTONE (Stand 8, Demonstration Room 321).

Technical Ceramics Limited, New Lane, Havant, Hampshire. Havant 6344.

Designed specifically for the critical enthusiast, the Solent bookshelf speaker measures only 14 x 9 x 8½ inches, weighs 10 lb. and costs £18. The suspension of the bass unit incorporated in this enclosure has received special attention to achieve a bass response free from resonances and other tonal colourations.

Also on show will be the internationally known Sonotone range of ceramic and crystal pick-up cartridges. These include the 9T AHC which features the unique "Flexi-Stylus," making accidental damage virtually impossible.

SONY (Stand 74, Demonstration Room 112, Office 307).

Sony UK Sales Division, Mercia Road, Gloucester. Gloucester 26841.

Together with their successfully established products in the tape recording field, Sony will be demonstrating for the first time in the UK their new range of superior hi-fi

and audio equipment, including amplifiers, transcription units and tone arms.



Sony TC260

In order to meet the interest anticipated in these products a static display will be exhibited on stand 74 and will be manned throughout the day. Brochures, prices and information can be obtained from here. Continual demonstrations will be given in room 112 at fifteen minutes to the hour, and technical staff will be in attendance at all times to answer queries.

STC (Stand b, Demonstration Room 202, Office 201).

Standard Telephones and Cables Limited, Acoustic Sub-division, West Road, Harlow, Essex. Harlow 26811.

In order to demonstrate the performance of its microphones, Standard Telephones and Cables Limited is undertaking a series of piano recital recording sessions in their demonstration room at the Russell Hotel under conditions very similar to those encountered by most amateur music recording enthusiasts. Microphones from the lower, medium and upper price levels will be used, and the music has carefully been chosen to test their capability. Both recording and playback will be in the same room, 202, thus approximating the difficult conditions often encountered by amateur recording enthusiasts.

The latest and most expensive of the three units is a new, high quality, cardioid condenser microphone, Model 4136, costing about £100 including its associated combined battery/mains power pack. This is a development of the 4126 microphone shown last year, and has a higher output and frequency response extending to 20,000 Hz without falloff.

Another microphone that will be used in the demonstration is the new model 4119. This hyper-cardioid, ribbon model is within the medium-price bracket, costing £26, and has a clean, crisp sound not normally associated with ribbon microphones. Model 4113 cardioid ribbon is now well established as an excellent, inexpensive microphone costing only £11 11s.

STEREOSOUND (Stand 9, Demonstration Room 214).

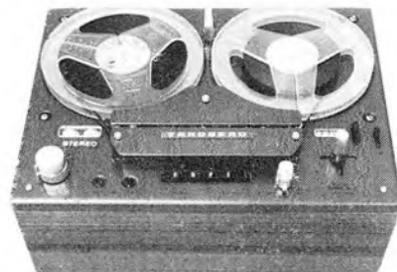
Stereosound Productions Limited, Capital Works, 12/14, Wakefield Road, Brighouse, Yorks. Brighouse 1755.

TANDBERG (Stand 17, Demonstration Room 212, Office 227).

Elstone Electronics Limited, Hereford House, North Court, off Vicar Lane, Leeds 2. Leeds 39834.

In addition to the Series 12 Tandberg tape recorder, which has now been acknowledged as one of the leaders in its class throughout the world, we shall be able to see for the first time the Tandberg Series 6X

models employing an extra bias head. Designated 62X and 64X, denoting the ½-track and 4-track versions, the Series 6X machines are claimed to set a completely new high standard for domestic recorders, particularly when operating at slow speeds. At 3½ ips the claimed specification is 20 to 18,000 Hz (± 2 dB 30-15,000 Hz), signal to noise ratio - 59 dB, wow better than 0.15 per cent. A special, fully transistorised, oscillator circuit has been incorporated, but the rest of the electronics is valve operated in line with Tandberg's declared policy to strive for the ultimate in performance rather than slavishly bow to the fashionable demand for complete transistorisation.



Tandberg 6X

All the other models in the Tandberg range will be available, together with qualified staff to help with visitors' inquiries.

TANNOY (Stand 68, Demonstration Room 547, Office 546).

Tannoy Products Limited, Norwood Road, West Norwood, London, S.E.27. Gipsy Hill 1131.

The complete range of Tannoy Dual Concentrics and Audiometric loudspeakers will be on view. In addition the complete range of enclosures will also be demonstrated, including the Autograph, the G.R.F., the York, the Lancaster, the 111LZ and the Audiometric.

Members of the Tannoy laboratory and sales department will be available in both the demonstration room and on the stand to answer visitors' questions and give advice on the building of enclosures, etc.

TAPE RECORDER SPARES (Stand 69, Demonstration Room 315, Office 316).

Tape Recorder Spares Limited, 323, Kennington Road, S.E.11. Reliance 5252.

Once again Tape Recorder Spares will be showing a profusion of pre-packed spares which are available at home and also exported to seven different countries. This firm has something to interest all equipment owners, whether they solder their own connections or not.

TAPE RECORDING MAGAZINE (Lounge 154).

Print & Press Services Limited, Prestige House 14/18, Holborn, E.C.1. 01-242-4742.

The Editor and Staff will be available during the show to welcome readers and other friends and to give advice wherever possible.

Current and back copies of *TAPE Recording Magazine* will be on sale, together with *Tape Recording Year Book*, our own series of *Tape Recording Handbooks* and special Binders for the protection of your file copies of the Magazine.

Please turn to page 150

MUCH TOO IMPORTANT NOT TO SEE

From the biggest crescendo to the smallest whisper, Truvox means supremacy in sound. A perfect combination of beautiful design and faithful reproduction. Recorders, Tape units, Amplifiers, Tuners and Speakers – no other machines can match them at their price.



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Continued from page 148

We shall look forward to seeing you in Lounge 154, and would ask you to please sign our visitors' book before leaving. Appointments can be made if the person you wish to see is not in the room when you happen to call.

TELEFUNKEN (Stand 16, Demonstration Room 542, Office 543).

A.E.G. G.m.b.h., Lonsdale Chambers, 27, Chancery Lane, W.C.2. Chancery 9944.

New for 1967 is the Telefunken Unit Plan equipment, comprising the T101 Stereo Tuner and V101 Stereo Amplifier. The tuner has four wave bands, including VHF/FM, built-in Multiplex Decoder and stereo indicator and is fully transistorised throughout. The amplifier has a claimed output of 50 watts (100 watts peak) with a response from 20 to 30,000 Hz \pm 3 dB.

The successful Telefunken Magnetophon 200 series of tape recorders, introduced for the first time last year, will again be featured. Prices are from 32 gns. for the M200 $\frac{1}{2}$ -track mono machine to 106 gns. for the versatile M204 $\frac{1}{4}$ -track stereo model. The latter machine has a claimed frequency response of from 40 to 18,000 Hz, can be used in vertical or horizontal positions and has a wide range of facilities.

THORENS (Stand 28).

Metro-Sound (Sales) Limited, Bridge Works, Wallace Road, Canonbury, London, N.1. Canonbury 8641.

For many years Thorens has been one of the most distinguished names in the world of transcription motors, turntables and units. This year not only have existing models been re-styled without in any way impairing their standards of efficiency, but a new series, the TD150, has been introduced with critical acclaim.

This series incorporates a transcription two-speed motor, available with or without a plinth, also combined with the TP13 pick-up arm, again with or without plinth. The most famous of all Thorens transcription motors, the TD124 is now available in its new styling and with improved motor suspension to accommodate the most modern pick-up arm requirements.

TRD (Stand 53, Demonstration Room 320).

Tape Recorder Developments Limited, 7, King George Avenue, Bushey, Herts.

TRUVOX (Stand 12, Demonstration Room 248, Office 262).

Truvox Limited, Neasden Lane, London, N.W.10. Dollis Hill 8011.

In Demonstration Room 248 the complete Truvox stereo tape system will be operating. Featuring Series 100 equipment, stereo broadcasts will be received using the FM 100 tuner and the MPX100 multiplex decoder. Before and after record monitoring will enable comparisons to be made between the quality of the signal fed into the equipment and the sound coming off the tape.

A wide selection of Series 100 models will be on show, including both half-track and four track stereo and mono versions. Newest in the range is the Belgravia, specially styled in teak to suit contemporary decor. All Series 100 models employ solid state, silicon circuitry.

UHER (Stand 47, Demonstration Room 122).

Bosch Limited, 205 Great Portland Street, London, W.1. Langham 1809.

The complete range of Uher tape recor-

ders will be on show. Star of the display will be the newly introduced 1000 Report Pilot, a machine specially produced for professional use with which it is possible to synchronise sound and film, as well as for reporting under professional conditions.

The 1000 Report Pilot can be used on many voltages and is an ideal size and weight, which, together with its recording quality, makes it a professional tape recorder of the highest standard.

VORTEXION (Stand c, Demonstration Room 149, Office 150).

Vortexion Limited, 257/263, The Broadway, London, S.W.19. Liberty 2814.

The complete range of Vortexion tape recorders will be on show, every one of which is available in either a high speed, or a low speed, version. Employing the Wearite Series 6 tape deck, the speeds offered are 1 $\frac{1}{2}$, 3 $\frac{1}{4}$ and 7 $\frac{1}{2}$ ips, or 3 $\frac{1}{2}$, 7 $\frac{1}{2}$ and 15 ips.

Model A is a high quality, monaural machine as used in recording studios, for radio and television programmes, and other professional applications. A peak programme type meter is used both for monitoring recording level and also for setting the value of the variable bias to suit the tape. Microphone input is low impedance, 15 to 50 ohms, and a power output of 3 $\frac{1}{2}$ watts is available at 15 ohms from the extension speaker socket.

The model WVB is similar in specification to the WVA but includes a separate playback head and amplifier, thus permitting "after record" monitoring. The stereo model is the CBL, an exceptionally versatile twin channel instrument designed to meet almost any recording requirement.

The full range of Vortexion mixers, mixer amplifiers, fader controls, etc., will also be on show, and technical staff will be available to answer questions and to assist.

WHARFEDALE (Stand 72, Demonstration Rooms 501 and 502, Offices 562 and 563).

Rank Wharfedale Limited, Idle, Bradford. Bradford 612552.

Renowned for the quality of their loudspeakers, Wharfedale are now introducing their new "System 20" high fidelity equipment. This will be on display for the first time in this country, and visitors will be invited to hear it demonstrated in conjunction with a range of Wharfedale loudspeakers.

"System 20" comprises a high quality, fully integrated, stereo amplifier with an output of 20 watts rms per channel, and an FM stereo tuner. Both these units are available in matching teak veneered cabinets, together with a choice of two gramophone

transcription units mounted on matching plinths.

Although these matched units are designed to be free standing or to be built into the owners' own cabinet, Wharfedale have produced as part of the System 20 range two complete unit sets of equipment in specially designed cabinets known as the Selby and the Howard. The Selby is in the form of a long, low table of contemporary design, the Howard is more conventional and houses the amplifier and tuner on a pull-out mounting. The two alternative transcription units that may be fitted are the Thorens TD124 or the Garrard LAB80, each fitted with an appropriate Shure cartridge.

WHITELEY (Stand 6, Demonstration Room 237, Office 239).

Whiteley Electrical Radio Co. Ltd., Radio Works, Victoria Street, Mansfield, Notts. Mansfield 24762.

A wide range of products will be displayed, comprising loudspeaker units and systems enclosures and matching equipment cabinets. The whole range of sound reproducing equipment is manufactured within the Whiteley organisation.

Stentorian loudspeakers are available in sizes from 2-inch diameter up to 18 inches, and these units are available with a variety of cone construction, speech coil impedance and magnet strength to suit all requirements. Three new additions to the range of high-quality loudspeaker systems will be exhibited; the LC93 the LC94 and LC95.

WILLIMAN (Office, 244).

K. H. Williman & Co. Limited, Blackford House, Sutton, Surrey. Melville 1491.

As exclusive exporters of a comprehensive range of audio equipment, K. H. Williman & Co. Ltd. look forward to greeting customers and friends from the four corners of the earth in room 244.

WILMEX (Office 346).

Wilmex Limited, Compton House, Malden Road, New Malden, Surrey. Malden 9566.

The export office of Wilmex Limited will be located in room 346 and their display will feature the current Series 6 range of Ferrograph tape recorders as well as the stereo systems and equipment made by Stereosound Products Ltd.

WIRELESS WORLD/ELECTRICAL & ELECTRONIC TRADER (Stand 55).

Iliffe Electrical Publications Ltd., Dorset House, Stamford Street, S.E.1. Waterloo 3333.

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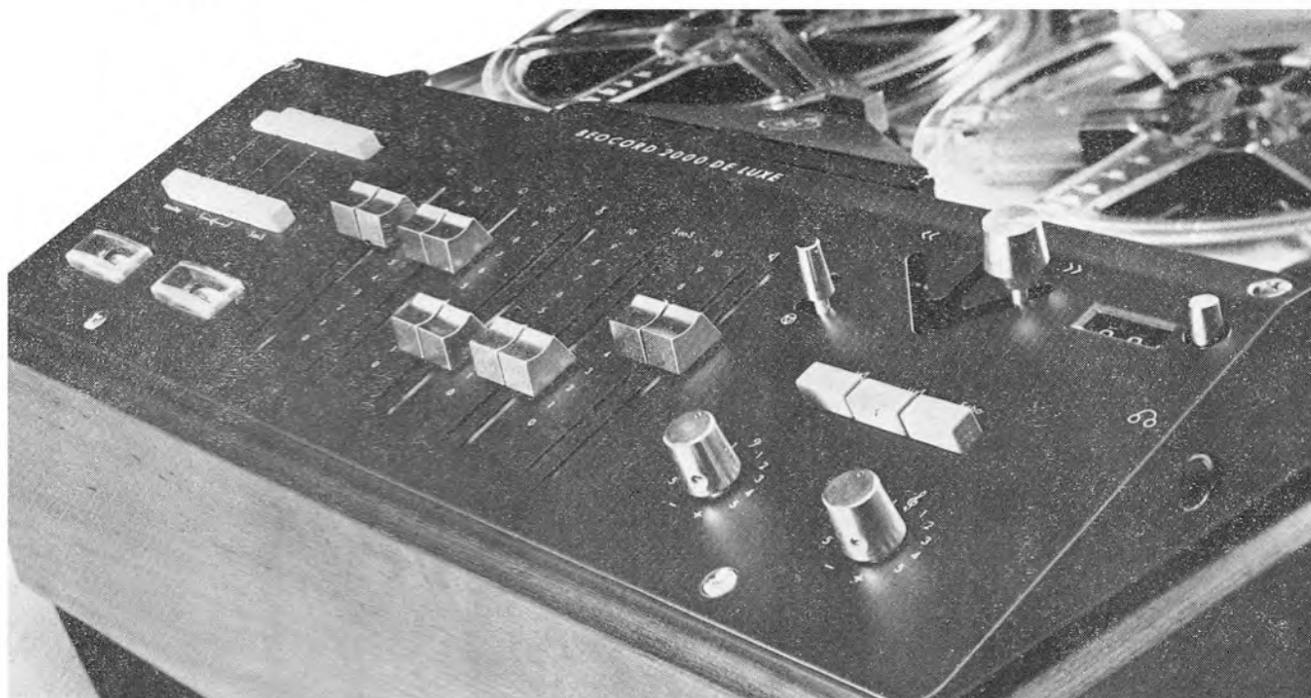
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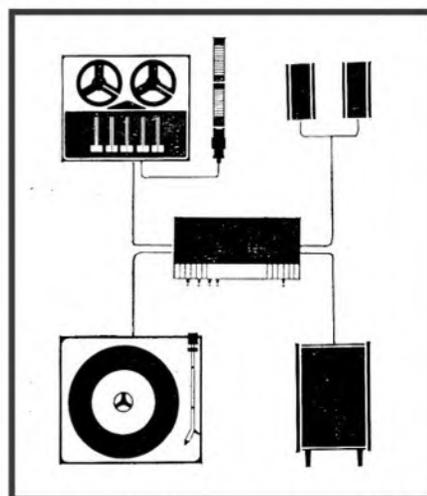
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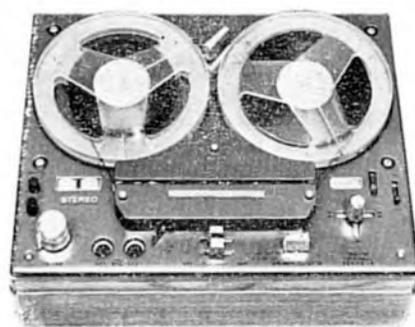
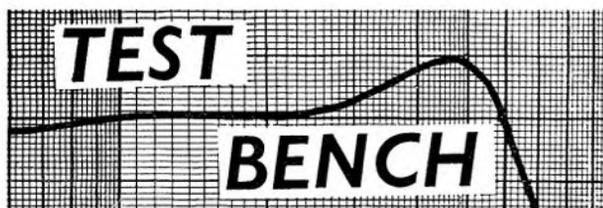


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TANDBERG 12/4

INVESTIGATED BY R. HIRST AND D. KILLICK

Manufacturer's Specification

Tandberg 12/4

Mains voltage: 220 volts 50 Hz AC.

Power consumption: 100 watts at 2 x 10 watts output power.

Tape speeds: 1 7/8, 3 3/4 and 7 1/2 ips. Speed can be changed whilst the tape is in motion.

Speed tolerance: ± 2 per cent, absolute tolerance.

Rewind time: Approximately 2 minutes for 1,200 feet without head wear.

Transistors: 35; diodes: 3; bridge rectifiers: 2.

Heads: 1 quadruple erase, 1 quadruple record/playback.

Record level indicators: 2 electronic beams, 1 each channel.

Distortion from tape: 5 per cent with indicator eyes just closed.

Inputs: 2 x microphone, 200 ohm unbalanced, 5-pin DIN, 2 x high level line 1 Mohm 75 mV, 2 x low level line 100 Kohm 7.5 mV.

FM-Mx filter: 19 kHz, switchable.

Signal/noise: - 55 dB at full modulation.

External speaker: 2 x 10 watts, 4 ohms.

Playback preamp. output: 2 x 5 Kohm, open circuit 0.75 volt independent of deck controls.

Centre channel output: In record mode, 0.75 volts open circuit, 82 ohms from each amplifier. Playback 3 volts, open circuit.

Frequency response:

7 1/2 ips 40-20,000 Hz (± 2 dB 40-16,000 Hz).
3 3/4 ips 40-12,000 Hz (± 2 dB 60-10,000 Hz).
1 7/8 ips 40- 7,000 Hz (± 2 dB 80- 5,000 Hz).

Wow: 1 7/8 ips better than 0.3 per cent, 3 3/4 ips better than 0.2 per cent, 7 1/2 ips better than 0.15 per cent.

Bass control: Continuously variable, giving up to 12 dB boost at 80 Hz, playback or amplifier modes.

Treble control: Continuously variable, giving up to 15 dB cut at 15 kHz, playback or amplifier modes.

Internal speakers: 2, 4 x 7 inches.

Dimensions: 15 3/8 inches long x 11 13/16 inches wide x 6 7/8 inches high. Teak cabinet.

Weight: Approximately 23 lb.

Price: 105 guineas.

TANDBERG 12/4 TEST CHART

Frequency Hz	Overall Response dB			Playback Only dB	Signal/Noise Ratio dB	Distortion
	7 1/2 i.p.s.	3 3/4 i.p.s.	1 7/8 i.p.s.	7 1/2 i.p.s.		
40	-0.8	-2.8	-5.9	-0.7	-57	4.8%
50	+0.3	-2.1	-2.4	+0.3		
60	+0.3	-2.0	-0.7	+0.5		
100	-2.1	-0.1	-0.7	-2.2		
250	-0.1	-0.5	-0.7	-0.1		
500	-0.8	0	-0.7	-0.9		
1000	0	0	0	+1.0		
2000	+0.5	+1.6	+1.5	+0.5		
4000	+2.6	+1.6	+2.5	+1.5		
6000	+2.8	+1.6	-0.4	+1.7		
8000	+2.6	+0.7	-0.6	+1.5		
10000	+2.4	+0.7		+1.3		
12000	+2.0	+0.8		+1.0		
14000	+2.2			+1.1		
16000	+2.4			+1.3		
18000	+1.8					
Wow and Flutter	0.07%	0.12%	0.25%			

NOTES.—The Overall Response figures relate to record and playback. Playback Only relates to the reproduction of a 70 microsecond test tape at 7 1/2 i.p.s. (C.C.I.R.).

For Signal-to-Noise Ratio the tape was recorded at peak level and then the input signal was removed from the record amplifier. By reference to the signal level recorded and the resultant tape noise, the noise voltage was read off, with the tape still in motion. Distortion is quoted against a 1,000 Hz signal recorded at the correct maximum level as indicated by the manufacturers, and the figure is an R.M.S. value.

Wow and Flutter is also R.M.S., the test frequency being 3,000 Hz. Test equipment used includes: Bruel and Kjaer Signal Generator, B. & K. Frequency Analyser Type 2107, B & K. Level Recorder Type 2305, Marconi Distortion Factor Analyser and W.H.M. Wow and Flutter Meter, Model III.

VERY occasionally it happens that reviewers receive a machine that they at once feel to be both mechanically and electronically "right"; such a machine is the Tandberg 1-track stereo 12/4. This is in spite of the fact that the model delivered had a minor, intermittent, mechanical fault—the transport system showed a reluctance to start during initial laboratory tests, although during user tests it behaved perfectly.

In view of this fault a second machine was examined in this respect only and found to be completely satisfactory. The first had probably received some rough handling by carriers and was in need of adjustment. We feel it is a great pity this little incident should have occurred, since it is our agreed opinion that the engineering precision is worthy of the highest praise. Controlled by

the movement of a single joy-stick, the deck emits only the quietest whisper to reveal that the tape is in motion. Our only real criticism is that the braking could be more positive; there was an occasional tendency to "wrap-round" when stopping from fast-wind, but there was certainly not the slightest chance of tape stretch.

Following the modern "furniture style" trend, the machine is enclosed in a smart teak case but without dust cover or carrying container. Both these items are available as extras. We did feel that the dust cover should have been included in the basic price.

Our findings from the laboratory tests are set out above in tabular form by the side of the maker's specification. In particular we would like to clarify the frequency response figures. One decibel is regarded as the smallest audible difference in sound

level, therefore fractions of a dB are of no more than academic interest since they will not be heard. With equipment in the upper price bracket, however, it is our intention to quote figures correct to the first decimal place as this is not only more interesting for the reader but is also more fair to the manufacturer.

Unfortunately, there is no information provided with the Tandberg to indicate what kind of tape is most suited to the bias setting of the recorder, although on subsequent inquiry we were told that Scotch type 150 is recommended. Lacking this information at the time, our tests were carried out using Agfa PE65 tape, for which the bias was not set. It is for this reason that the frequency response is slightly outside specification at 7½ ips, although it will be noted that this deviation is less than 1 dB. The overall frequency response at all speeds was very creditable, closely approaching that attained in professional recording studios.

Crosstalk is not quoted in our table above. As this could be neither measured nor heard at 1 kHz no further comment is necessary.

With regard to distortion, it must be pointed out that this is a function of the bias adjustment and level of signal. Using Agfa PE65 tape (for which, as we have already mentioned, the bias was not set) full modulation of a 1 kHz signal produced a total rms harmonic distortion of 4.8 per cent across the amplifier output socket. Whilst this figure is acceptable it is felt that for an instrument of this quality the level should not be in excess of 3 per cent. It must be stressed that the distortion content would probably improve by the use of the recommended tape, that the measured level is nevertheless within specification, and the criticism is a purely personal one.

The performance indicated by the above figures places the Tandberg 12/4 in the very

top class of domestic tape recorders, and the user tests confirmed this conclusion. Firstly, we were impressed by the provision of alternative connection sockets for both inputs and outputs. The convenience of having both 5-pin DIN sockets and phono sockets wired in parallel (external speaker sockets are jack and 2-pin DIN) is delightful. This shows a real consideration for the user by the manufacturer.

The deck has a pair of 3-position control levers, centrally placed, and these select the functions, Record, Playback and Amplifier. Setting the control to its Amplifier condition we fed in a number of sound sources, including FM radio mono and stereo, another tape recorder and the output from a ceramic cartridge. A pair of full-range speakers were driven from the two, 10-watt, external speaker sockets. The impedance is 4 ohms, which is fashionable today. Quality was first class. The pair of sensibly large level controls enable accurate setting and the sound quality at the speakers was to Hi-Fi standards with virtually no amplifier noise at all. Although tone controls offer facilities for only top cut and bass boost we feel that in its Amplifier function the Tandberg could well be used as the nucleus of a stereo Hi-Fi system if quality of sound is more important than wide range of tonal control.

When we came to record we particularly noted the two "magic eye" type level indicators. These are brilliantly lit, easy to use and so precise that the level may be set correct to within 2 dB in any repetitive recording, and the level between tracks may also be held to this figure. A very positive pause control is provided so that levels can be set before recording starts.

Although this pause control separates the pinch wheel from the capstan, these two members are left in contact when the automatic stop (microswitch) operates with

the joy-stick in the run position, and they would also be left in contact if the power supply were to be disconnected with the joy-stick in this function. The owner should exercise great care to return the joy-stick to its neutral position, as otherwise a flat might appear on the rubber pinch wheel and this would spoil the very good wow and flutter figures. Insufficient attention is drawn to this point in the instruction book.

All recordings undertaken were highly successful, including an FM Multiplex transmission. 19 kHz switchable filters are incorporated in the FM input sockets. Quality was excellent again when fed through external speakers, and remarkably good through the pair of small, monitoring speakers provided internally, although when using these output power must naturally be kept to a reasonable level. The speaker selection control on the deck provides for switching almost every possible speaker combination, internal and external, on the two channels.

Recordings of music were taken on each of the three speeds, 1½, 3½ and 7½ ips. Apart from a small increase in background noise there was no obvious difference when dubbing off the air between 3½ and 7½ ips. At the slowest speed, 1½ ips, intelligibility of speech was good but there was naturally a loss of top. Even with the Tandberg we cannot yet achieve Hi-Fi quality at 1½!

Reproduction of tape records was excellent as might be expected from the CCIR response figures. Dispensing with an additional amplifier we powered speakers direct from the external speaker sockets and played back some favourite tapes of established quality. We had certainly never heard them reproduced better. Our final conclusion was that the Tandberg 12/4 is an outstanding machine that can only enhance the already established reputation of its makers.

FOR THE FIRST TIME . . .

MUSICASSETTE REVIEWS

THIS month sees an innovation in the pages of *TAPE Recording Magazine*. For the very first time we are reviewing pre-recorded music in cassette form—"Musicassettes," as they are called. We believe that we have an obligation to our readers to keep them abreast of all the latest developments in the world of recorded sound. Cassette type machines will not disappear if we close our eyes to them; in fact we would forecast an ever-increasing growth in their popularity and in the public interest in them.

The cassette machine does not pretend to compete in the hi-fi market as we know it today. What it does do is to offer at low cost, and in the most convenient form yet devised, a standard of quality that will be found to be wholly acceptable to a very large number of people.

The cassette mechanism is a compromise, and as such is inadmissible to the dedicated hi-fi enthusiast. But on the other side of the coin the cassette offers a means of reproducing music to a far higher standard than that enjoyed in

many homes today—and let us stress again that it does this at relatively low cost. True recorders, they are also capable of producing their own recordings to an equally high standard.

Do not be led astray by the inadequacy of the amplifier and loudspeaker built into the smaller cassette machines. These are notorious for producing nothing more than a feeble, "transistor radio" sound. This is entirely due to the inadequacy of the machine itself, and not to either the cassette or the cassette mechanism. If the output from that little battery machine were to be fed, via an amplifier, to a full range speaker, we should really hear what is on the tape.

It is quite impossible to satisfy all the people all the time. We shall, of course, continue to review high quality, spool-to-spool tape records, but we feel quite sure that an increasing number of people are going to obtain enjoyment and satisfaction from cassette equipments, and for those people we now offer our first reviews of Musicassettes.

I COULDN'T LIVE WITHOUT YOUR LOVE. Petula Clark. Pye CYP 150. 40s.

There's just no comparison between Petula Clark and some of the latter day, popular female vocalists. Did I say vocalists? Apologies to Petula!

Always the nice girl, who could as easily be my sweetheart as yours, Petula Clark offers on this recording a selection of some of our best popular songs which she performs with accomplished ease. Side one gives us *Strangers in the night*, *A groovy kind of love*, *Rain*, *Wasn't it you*, *There goes my love there goes my life*; *Monday Monday*. On side two the collection includes *Bang bang*, *Homeward bound*, *Two rivers*, *Come rain or come shine*, *Elusive butterfly* and *I couldn't live without your love*. What a collection of rattling good tunes!

Well recorded, with plenty of presence in the voice, this cassette is pure entertainment of the very best kind. Pet Clark's rendering of *Strangers in the Night* comes over exceedingly well, perhaps surpassed only by her final item, *I Couldn't Live without your Love*. A thoroughly good tape to be strongly recommended.

Please turn to page 156

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MUSICASSETTES

(Continued from page 154)

GOING PLACES!! Herb Alpert and the Tijuana Brass. Pye CYP 156. 40s.

We might be excused for thinking that the brass and percussion of Herb Alpert would strain the system to its utmost. In fact this is a delightful recording with a sound quality to please exacting listeners. Instrumentation is clean and clear. This is not a cassette, it is Herb Alpert. The items include *Walk, don't run, Spanish flea, And the angels sing, Cinco de Mayo, A walk in the Black Forest, Zorba the Greek, Tijuana taxi, I'm getting sentimental over you, More and more amor, Felicia, Mae, Third Man theme*. If this is your kind of music, then this is for you. As for me, I am chasing a Spanish flea into a Tijuana taxi.

HI-FI IN HAWAII. The Hawaiian Hula Boys. Columbia TC-SCX 3258. 40s.

What's all this about? Surely we can't have hi-fi on a cassette? Are we being sold a pup, or what?

Well, I reckon my fi is pretty high, and this recording measures up to it extremely well. So it's not quite the ultimate—so what? Take it from me, it's not a second-rate substitute for the real thing. I am left wondering at the wizardry that has put such excellent sound on such a narrow, slow moving, band of tape. The numbers are *Moonlight and roses, To you sweetheart, When you dream about Hawaii, Sing me a song of the islands, Moonlight Bay, Aloha Oe, Honolulu, Blue Hawaii, Trade Winds, Hawaiian war chant, Pagan love song and Blue Tahitian moon*. Recording is brilliant, performance is good, and the sound is very much further up the hi-fi scale than some might care to admit. Another rattling good cassette.

TCHAIKOVSKY. The Swan Lake. Lon- don Symphony Orchestra conducted by Pierre Monteux. Philips CPC 0003. 45s.

We're on tricky ground here. Classics on cassettes, what next? Let's face it, as compared to the conventional spool-to-spool tape records we are going to have to put up with a restricted frequency response in the cassette system. This can be an obvious deficiency to the trained ear, but to me it is more surprising to note how much we've got rather than how much we have lost.

Ever popular, this recording of *Swan Lake* will be enjoyed by many who are content to accept the inevitable, minor quality restrictions. What is left is well worth listening to, and what is lost is insignificant to most.

MOONLIGHT CONCERTO. The Mela- chrino Orchestra conducted by George Melachrino. HMV TC-CSD 1276. 40s.

The items in this popular collection include *Theme from the Grieg Piano Concerto, Theme from the Tchaikovsky Piano Concerto, Theme from the Rachmaninoff Piano Concerto, Concerto in Jazz, Slaughter on Tenth Avenue, Copper Concerto and Concerto for Clarinet*.

The long, sustained piano notes in the concerto extracts on side one are really asking for trouble. If we can get away with this at 1½ ips we can get away with anything!

How does the cassette face up to this most gruelling test? To be absolutely fair I took the precaution of playing back this cassette

to a number of people to assess different opinions. Wow and flutter can be more offensive to some than others. To my ear the speed instability caused pitch variation beyond the limits of acceptability. But mine was a minority opinion and others found the recording acceptable in this respect. All were agreed that the overall quality was far better than had been thought possible. The moral is to steer well clear of this cassette if your sensitivity to speed variations is greater than your love of the popular items in the programme; if it isn't you're lucky because you can then enjoy some very pleasant music.

STRANGER ON THE SHORE. Acker Bilk. Columbia TC-SCX 3434. 40s.

On the label this record is described as by Acker Bilk Esquire with the Splendid Assistance of the Leon Young String Chorale. Splendid is right. We could also refer to the splendid recording, the splendid sound quality and the splendid performance.

For Acker Bilk fans this cassette is a must. The items are *Take my lips, Is this the blues, Cielito Lindo, Deep Purple, I can't get started, Carolina Moon*, and on side two *Stranger on the shore, Lullaby, Mean to me, Greensleeves, Nobody knows, Sentimental Journey*. I would hesitate to recommend a "best buy," but of the cassettes reviewed this month my favourite is undoubtedly this Acker Bilk album. Poor recording would have ruined my enjoyment of the famous Acker Bilk blend of sound. As it is I enjoyed the tape thoroughly, and I hope you will too.

BERLIOZ. Symphonie Fantastique. Lon- don Symphony Orchestra conducted by Colin Davis. Philips CPC 0004. 45s.

Once again the cassette is subjected to the full weight of the symphony orchestra performing one of the most dramatic works in the repertoire. Ranging from the subtle tonal gradations of pianissimo passages to the brilliant brass and percussion of the fourth and fifth movements, the weakest sections of the recording are in the slow, quiet passages. This is compensated by a very surprising brilliance later in the work. Offered complete with copious, well-written programme notes I regard this cassette as something of an enigma. Perhaps it was published to test reaction. Although it could not be universally recommended without some qualification I regard it as a very interesting example of what the system can do under the most testing conditions. Given the right reproducing equipment only the most bigoted could deny the value of this recording.



Tape records reviewed

SIBELIUS. Symphony No. 4 in A minor, Opus 63. The Swan of Tuonela, Opus 22, No. 3. Symphony No. 5 in E flat major, Opus 82. Tapiola, Opus 112. Berlin Philharmonic Orchestra conducted by Herbert Von Karajan. Ampex DKG 8974, four-track stereo, 7½ ips. 119s. 4d.

As strongly individualistic as he is nationalistic, Sibelius in his Fourth Symphony presented a work of unusual construction, far in advance of the year of its composition, 1911. The influence of Sibelius upon contemporary composition has been more significant than many appreciate. He is the supreme example of the nationalistic composer whose art has transcended the narrow confines of mere patriotism into the realms of universal nature.

Of the Sibelius symphonies, No. 4 is probably the most difficult to understand. Melancholic in tone, never depressive in feeling, it contains a strange and yet fascinating medley of sound. It was said to be the composer's own favourite symphony, and this would indeed be within the nature of the man himself.

Here is no light trifle; here is no facile work that may be listened to or not as one wishes. The Sibelius Fourth demands attention, just as it demands, from me at least, an ungrudging admiration for the musical expression of one of the greatest figures to pass across the musical stage of recent years.

There can be, to my mind, no more sweet, no more haunting, no more beautiful melody than that expressed by Sibelius in the Swan of Tuonela. As was so much of Sibelius' work, it is based upon Finnish mythology. No one who has not heard this tone poem could possibly appreciate the vast depth of descriptive writing it contains. Famous for its cor anglais solo, the melody of The Swan of Tuonela brings to the mind of the listener visions of great northern landscapes—lands of sublime beauty but utter desolation.

Perhaps that subjective image is wrong. It actually tells the story of Tuonela, the land of the dead, upon whose waters the swan is gently borne.

Dismissed by some as no more than a mythological picture, the Swan of Tuonela is to me one of the most beautifully descriptive works ever written. It never fails to profoundly move me whenever I hear it, almost as though it had some personal message for me alone. Strange, but this personal contact between the music and the listener is experienced when this work is heard even by someone possessing no musical feeling at all. Of all too brief duration, it can be thoroughly commended to all, whatever their tastes might be.

The Fifth Symphony is truly pastoral. Sibelius never moved far in musical thought from the elemental beauty of his rugged homeland. The Fifth Symphony is an expression of rural tranquility, the peace of the lakes and the mountains. Composed in 1915, the influence of the first world war invades the symphony itself as it works up to a dramatic climax at the end of the Fourth movement.

Disillusioned by world events, it was in keeping with his character that Sibelius should have been dissatisfied with this work,

constantly revising it until 1919, the year after the war ended. Perhaps he could not reconcile his own conflicting emotions to the expression of his music until the great conflict had subsided.

The final item in this album is again based upon northern mythology. Tapiola is the legendary home of the forest god, Tapio. Of all his works perhaps this is the most expressive of primitive, mysterious force. Whilst the Swan of Tuonela is one of the most relaxing and beautiful works ever written, Tapiola is by contrast one of the most disturbing. Here we do not have a calm appreciation of natural beauty, but rather an apprehension of dark forces far beyond our understanding.

I find I have said rather a lot about the works in this album. May I add that both the recording and the performance are of as high a standard as the programme content. With a total playing time of some 96 minutes, this record would be a superb addition to any thinking man's music collection. And to those who prefer not to think on deeper things I also recommend it strongly, because I have yet to meet a single person who, having heard these works of Sibelius, has not expressed appreciation of at least one of them.

BEETHOVEN. Middle String Quartets Opus 59 (Rasumowsky), Opus 74, Opus 95. Amadeus Quartet. Ampex DGG 8536 four-track stereo, 7½ ips. 179s. 4d.

This set comprises two spools, the first with a playing time of 70 minutes, the second 75. It is an exquisite recording of the five string quartets of the Beethoven middle period.

I have now listened to these records many times, and thought very deeply on what to say about them. Whenever I started to write, the words seemed to be so hopelessly inadequate that I threw the paper away and postponed the job to another day.

It would be absurd for me to attempt to "sell" the idea of the Beethoven String Quartets to you, the reader. Either you have an appreciation of music in this form, or you do not. If you do not I sincerely hope you one day will, because then you will find as I did, this album to be one of the most thrilling you have ever experienced.

Is "thrilling" the right word? Surely these string quartets should appeal, not to the emotion, but to the intellect? So be it; perhaps I can extricate myself from that position by claiming that my intellect was thrilled by the sound of the Amadeus Quartet in their performance of these great works. This I do indeed find to be a thrilling sound—and if I claim to have smelt the rosin on the bows of the instrumentalists I feel sure I will be forgiven for a minor exaggeration. The sweet concord of noble sound produced by this famous quartet requires no endorsement from me, but only a confirmation that it has not been lost in this particular recording. As indeed it most definitely has not.

There is little need for me to say very much about the quartets themselves, since an excellent, twelve-page booklet is enclosed with the set. If only more companies would be as liberal with their programme notes. Each work is set in its historic and musical context by Heinz Becker, who guides the listener through the period 1806 to 1810.

It is unlikely that this album will be purchased as a passing whim. One cannot relate its value to its cost, as the answer is going to depend entirely upon the prospective purchaser's own standard of values.

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In the perfect society such a work of art would be made freely available to all, as it is we must either pay up or go without. Since under modern conditions the obvious tendency is to go without those things that are apparently not necessities, do I dare suggest that this album could make a most delightful wedding, or twenty-first birthday present? To the right person such a gift would be appreciated all their lives, long after the mass-produced trivia have been broken and forgotten.

By the way, with uncommercial modesty Ampex do not mention the fact that they also publish both the early and the later quartets as separate albums. What a magnificent collection they would all make!

* * *

PROKOFIEV. Symphony No. 5, Op. 100.
The Cleveland Orchestra, conducted by George Szell. Epic EC 819 four-track stereo 7½ ips. 75s.

The Prokofiev Fifth is not a work that can be dismissed lightly. We find within the box containing the tape a four-page leaflet which not only gives copious notes on the four movements of the symphony but also some biographical background to the composer.

For twenty years before the war Prokofiev toured the world performing and conducting his own music. During that time his homeland, Russia, was suffering the pangs of revolution. Appalled by the senseless carnage of world conflict he returned to Russia and his Fifth Symphony was the first major work he produced as a Soviet citizen. Writing the entire score of the Fifth in one month in the summer of 1944 he spent another month orchestrating it—and in between wrote the score for Eisenstein's film "Ivan the Terrible." This is surely a measure of his greatness as a composer.

The precise period in time when the symphony was written is highly significant. Prokofiev was not merely writing a piece of music but was expressing in musical terms his faith in humanity and the inevitable triumph of good over evil. He had seen the Soviet Union almost brought to its knees a couple of years earlier and he had witnessed the miraculous recovery as the tide of battle turned. In the summer of 1944 Prokofiev, like most of us, was filled with optimism for the future. The war once so nearly lost was now about to be won. In the music of the Fifth Symphony he expressed not merely the narrow patriotic rejoicing of a citizen of a victorious country but he epitomised the aspirations of the free world.

Since that summer of 1944 we have all been disillusioned; but none more cruelly than Prokofiev. In 1948 he was denounced by the Stalin regime along with a host of other intellectuals as decadent. In 1958, after Stalin's death, he was officially rehabilitated, but this was no more than a post-humous gesture—he had died himself on 5th March, 1953, the very same day as Stalin.

Such is the background to the Fifth Symphony. What of the work itself? Unlike so many contemporary works the Symphony is not a break with tradition, but rather a modification of the classical approach. It is a work that cannot be either heard or understood by superficial listening. It is a

work that may be heard over and over again, always telling the listener something new and never tiring with repetition. Every time I have heard this Symphony I have been left with a strange, uneasy feeling of having looked deeply into a disturbing vision too profound for comprehension. Here is an exposition of what life is really all about—and such a close look at reality can be a very salutary experience.

I have purposely refrained from mentioning the recording quality until last because this is somewhat enigmatic. There is a very definite increase in background noise as the master tape is faded in. There is also an unusually "toppy" colouration to the sound. Judicious application of top cut at the amplifier both reduced the level of background noise and removed the rather harsh quality of the sound. Having made these criticisms I must in fairness add that in all other respects the recording was excellent, with a very full frequency range and delightfully melodic quality to the sound.

To summarise, this is an excellent recording of a great work, the grandeur of which is likely to secure for it a permanent place in the hearts of music lovers for as long as music survives.

* * *

TRUMPET CONCERTO. Vienna State Opera Orchestra, Conductor Herman Scherchen. Telemann Concerto for three Trumpets, Stoezel Concerto Grosso for six Trumpets, Corelli Concertino for two Trumpets, Manfredini Concerto for two Trumpets, L. Mozart Concerto in D Major. Westminster WT 502, four-track stereo, 7½ ips. 75s.

Of all the instruments of the orchestra none is more beautiful and none has suffered greater abuse than the trumpet. Enduring the indignity of a multitude of artificial mutes, its sound is commonly twisted and wracked out of all recognition. But here we have the pure, orchestral sound of the trumpet as it was intended to be heard. In all the works on this recording the trumpets fulfil the dominant role of soloists, thus giving them full range of expression and tonal quality.

The choice of items is interesting, particularly the last, Concerto in D Major for Trumpet by L. Mozart. The name of Mozart is so indissolubly linked to the Christian name of Wolfgang that one tends to overlook the fact that the great genius not only had a father but that this father was no mean musician in his own right. Comparisons with his son's work are inevitable, and indeed revealing.

Recording quality leaves nothing to be desired. In particular the opening of the Manfredini on side two has a clarity and brilliance that will delight and thrill the listener. This is a most delightful tape, offering the authentic 18th Century sound in an imaginative selection of compositions. Desirable for most to own, I would regard it as "obligatory listening" for any who might play the instrument themselves.

Opening with the Telemann Concerto in D Major, we have a work so logical in construction that it will sound very familiar to the listener even though he might never have heard it before. The Stoezel Concerto Grosso for six Trumpets impressed me less than the other items. Notoriously difficult to play in this exacting work, there are rather more "humanities" in this performance than I would care to hear. Both the Manfredini Concerto for two Trumpets and the Corelli Concertino for two Trumpets are magnificently performed and offer the most pleasant listening one could wish for.

NEW PRODUCTS

PRO RECORDER FROM AUSTRALIA

THE Rola division of the Plessey Components Group, Australia, have produced the first of a new generation of solid state magnetic tape recorders to be manufactured in Australia.

Designated model 707, the console's electronics, which include replay line and monitoring amplifiers, are completely transistorised. The horizontal tape deck is of advanced design. Facilities include an accurate tape footage indicator, single-switch change for motor speed and amplifier equalisation, smooth, stable speed in less than 0.5 seconds, continuously variable spooling, precision capstan drive motor and complete electro-magnetic press button operation. Full remote control facilities are provided.



The equipment is particularly suitable for tape editing purposes, operators having free access to tape passing over the playback head so that accurate editing can be achieved. The model 707 console is housed in an attractive cabinet and is equipped with a Rola 12 in. dual cone, high fidelity loudspeaker, vented for quality sound reproduction. The price is available on application.

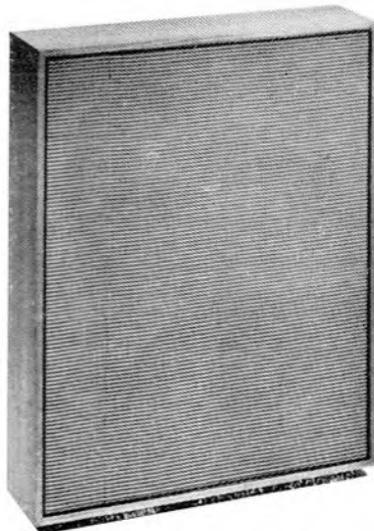
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The power handling capacity is stated as 10 watts, impedance 15 ohms. Measurements are 19 x 12½ x 8½ inches, weight 20 lb. and cost 13 gns. in teak or 14 gns. in rosewood.

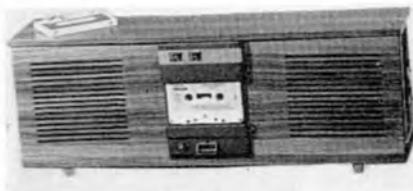


The LC94 acoustic labyrinth enclosure is fitted with an acoustic resistance and houses the new 9 in. graded cone drive unit as used in the LC93. Power handling capacity is 10 watts at 15 ohms, and the cabinet dimensions are 29½ x 23½ x 6½ inches. This unit is available in teak at £21 or rosewood at £22 10s. 6d.

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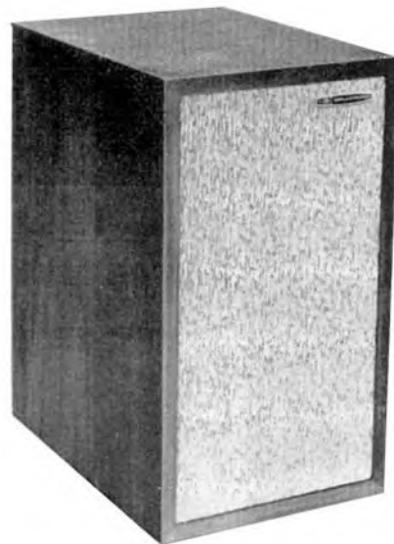
The quality obtainable from this equipment is worthy of full range extension speakers, outlets for which have been provided giving a quoted 4 watts of power per channel, 15 ohms. The Sonic 8 has a claimed playback response of from 60 to 10,000 Hz ± 3 dB, and a signal-to-noise ratio better than 40 dB. Record level indicators are in the form of two meters and separate amplifier controls are available for channel 1 and channel 2, together with tone controls. Inputs are provided for two microphones and auxiliary inputs for tuner or pick-up.

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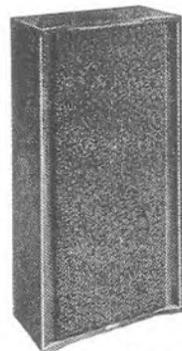
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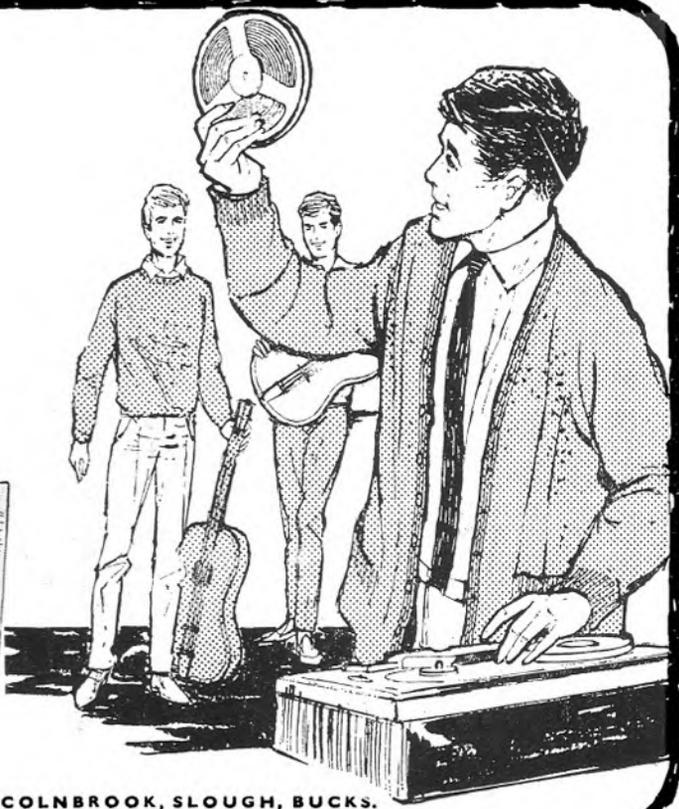


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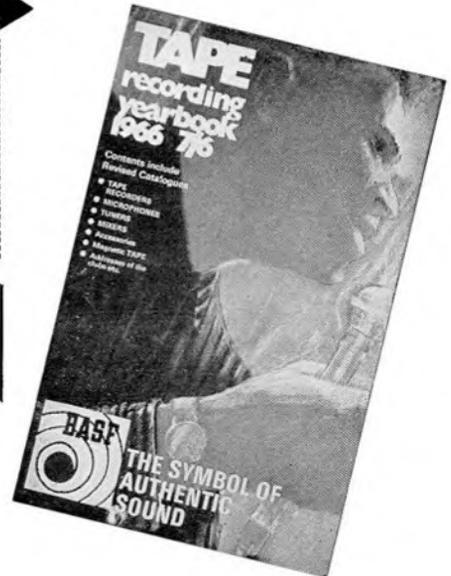
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Check the facts for yourself—Booth 40, Audio Fair



C60 gives 60 minutes recording time (2 x 30) Compact Cassette
 DC90 gives 90 minutes recording time (2 x 45) System International
 Both in protective plastic storage box.

PROVED BY THE PROFESSIONALS

To: Magnetic Tape Division, Agfa-Gevaert Limited, Great West Road, Brentford, Middlesex.

Please send me illustrated brochure on the new Agfa Magneton Recording Tape Cassettes and comprehensive price list.

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