

...auf dem Saal...

LONDON

AUDIO

FAIR

...für ein...

April

1960



*Those who
know
insist on . . .*



TRADE MARK
SCOTCH
BRAND

recording tape



SEE US ON STAND NUMBER 301

**THE
LONDON
AUDIO FAIR**

1960

at the

HOTEL RUSSELL

LONDON, W.C.1

THURSDAY 21st – FRIDAY 22nd

SATURDAY 23rd – SUNDAY 24th

APRIL

11 a.m. to 9 p.m.



CATALOGUE 2/6

THE COUNCIL OF MANAGEMENT

V. G. P. WEAKE (*Chairman*)

M. L. BERRY (*Vice-Chairman*)

L. H. BROOKS (*Hon. Secretary*)

D. A. LYONS

J. W. MAUNDER

G. E. SPARK

T. R. B. THRELFALL



Exhibition Organiser and Officer:

C. REX-HASSAN



The Exhibition Office for the duration of the Fair is in Room 244 on the Second Floor.

The permanent Secretarial and Administration Office is at:
22, Orchard Street, London, W.1. WEL 9111.

The permanent Exhibition and Organisation Office is at:
42, Manchester Street, London, W.1. HUN 2080.

Press Information: JOHN CARLSEN, PATRICIA PRIDDY.

The Central Press Bureau is in the Glass Hall, and there is a Press Lounge in Room Number 344.

. . . for the guidance of visitors

This London Audio Fair, 1960, is divided into two distinct Sections.

In the **First Section** on the ground floor in the Exhibition Halls are Booths on which Exhibitors are displaying their Products. These Booths are manned by expert personnel who are able to discuss any aspect of their equipment.

The **Second Section**, and the one which is considered the most important, is on the First, Second and Third floors of the Hotel. On these floors the manufacturers who are exhibiting are giving live demonstrations. The way up to their demonstration rooms is by means of the main Hotel staircase, situated straight on through the Halls. There are other staircases for visitors to circulate around and down to visit any room, and there is a special staircase from the demonstration room floors allowing re-entry into the Main Halls.

The Audio Fair is well sign-posted, and visitors should not have any difficulty in finding their way about. On the Corridor Walls are plans of the floor; these can be spotted quite easily because of their red frames.

SPECIAL FEATURES

Two most interesting displays in this Fair are being arranged by the British Broadcasting Corporation and the British Sound Recording Association respectively. The one of the B.B.C. is in two parts—a display on Booth 72, and a Demonstration in Room 144. The Special Display of the B.S.R.A. is to be found at the head of the stairs on the first floor. It is clearly marked and cannot be missed.

AMENITIES

There are ample cloakroom facilities in the Hotel for visitors who would like to leave their hats, coats and parcels.

A large bar is situated near the front Hotel entrance, and there are also spacious lounges. There are excellent restaurants adjacent to the centre Exhibition Hall, where either *Table d'hôte* or *à la carte* meals can be obtained. Light refreshments are also available in the Hotel lounges throughout the opening times of the Exhibition, and there is an extension of licence for alcohol during the afternoon hours.

An Information Bureau is situated in the Glass Hall with courteous staff who will be pleased to answer any queries and offer any guidance required. Next to this is a special lounge for the benefit of Overseas Visitors. Interpreters are available.

Overleaf will be found plans of the main Halls and demonstration floors. They all clearly indicate the position of the Exhibitors' rooms and on which floor these rooms are. They also show how to get about the Exhibition. Following on will be found an Index of Exhibitors with a note of products being shown and manufacturers' addresses. Next to that is a Guide by Products.

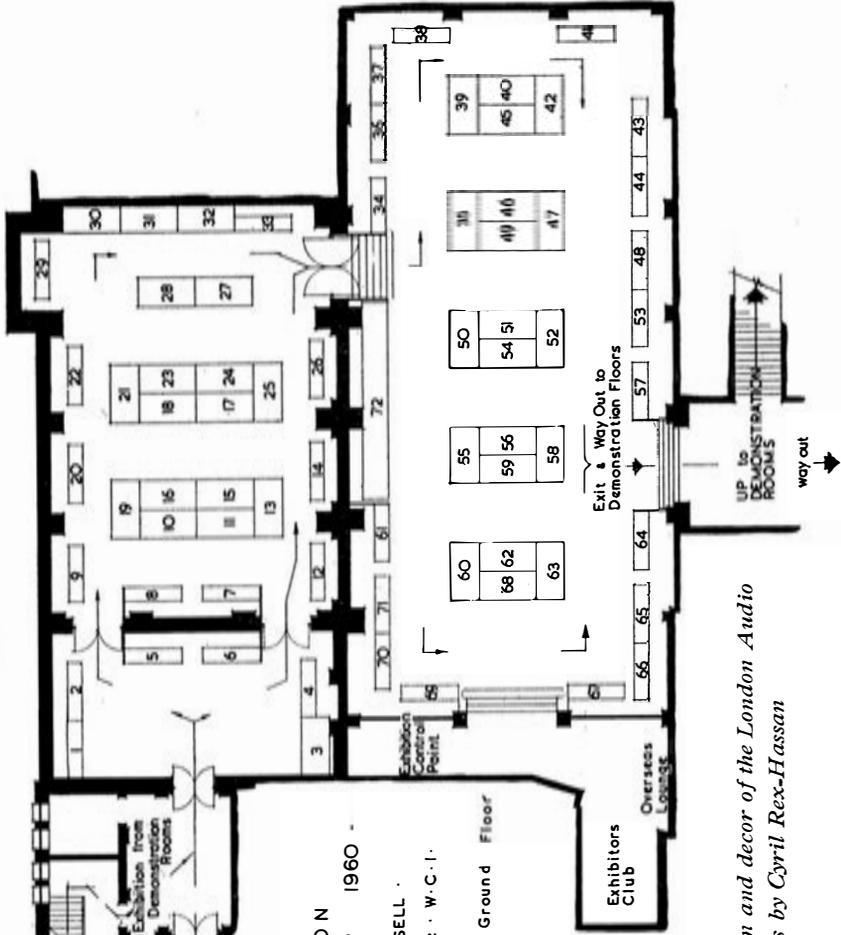
Bernard Street
MAIN ENTRANCE

re-entry to Exhibition from
Demonstration
Rooms

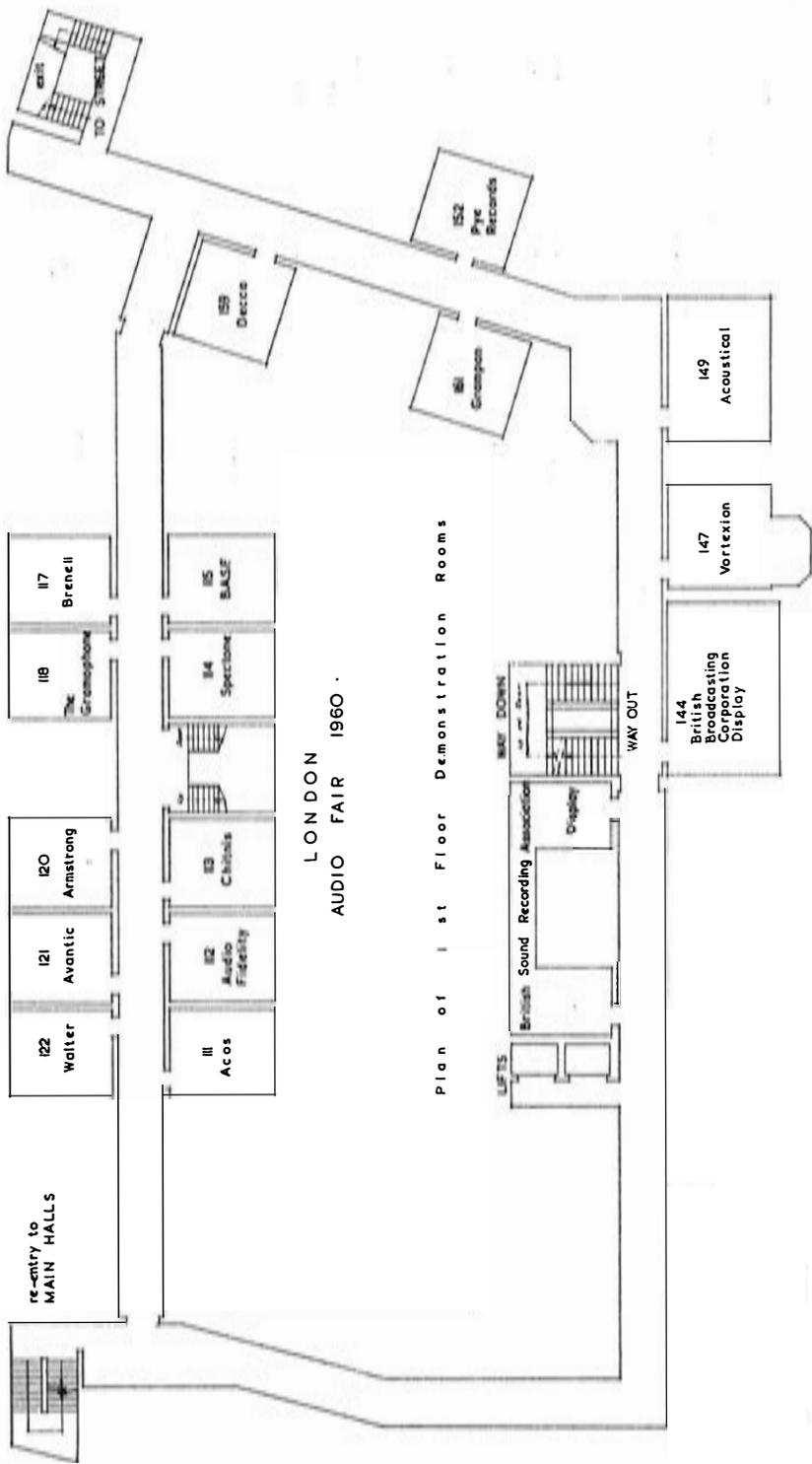
LONDON FAIR 1960 -
AUDIO FAIR

HOTEL RUSSELL -
Russell Square - W.C.1.

Plan of Booths - Ground Floor



The layout, design and decor of the London Audio Fair is by Cyril Rex-Hassan



LONDON
AUDIO FAIR 1960

Plan of 1st Floor Demonstration Rooms

re-entry to
MAIN HALLS

117 Brenell
118 The Gramophone
120 Armstrong
121 Avantic
122 Walter

111 Acos
112 Audio Fidelity
113 Chiniks
114 Spektrik
115 BAILEY

158 Decca
161 Gramopon
152 Pye Records

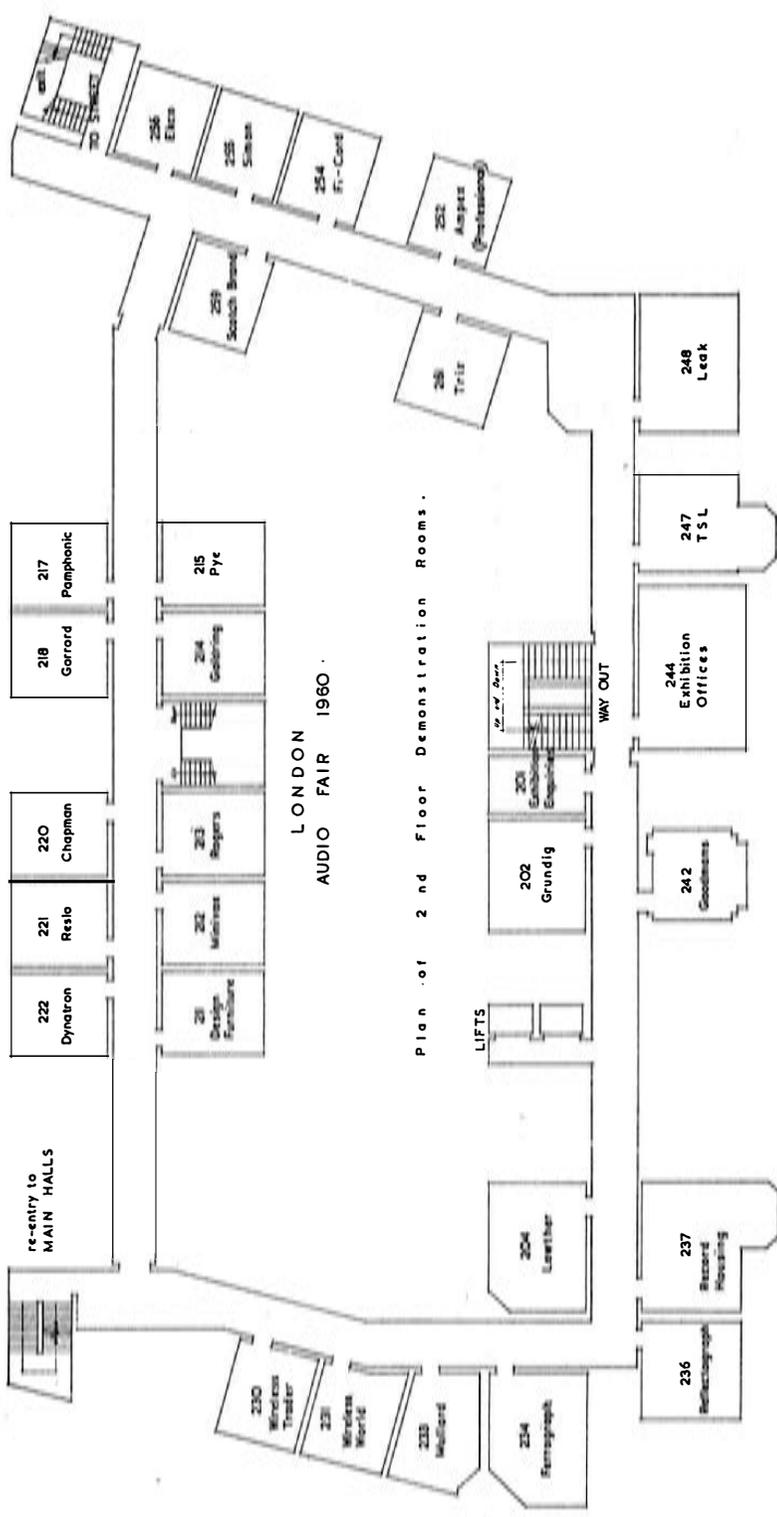
149 Acoustical
147 Vortexion
144 British Broadcasting Corporation Display

LIFTS
UP DOWN

British Sound Recording Association Display

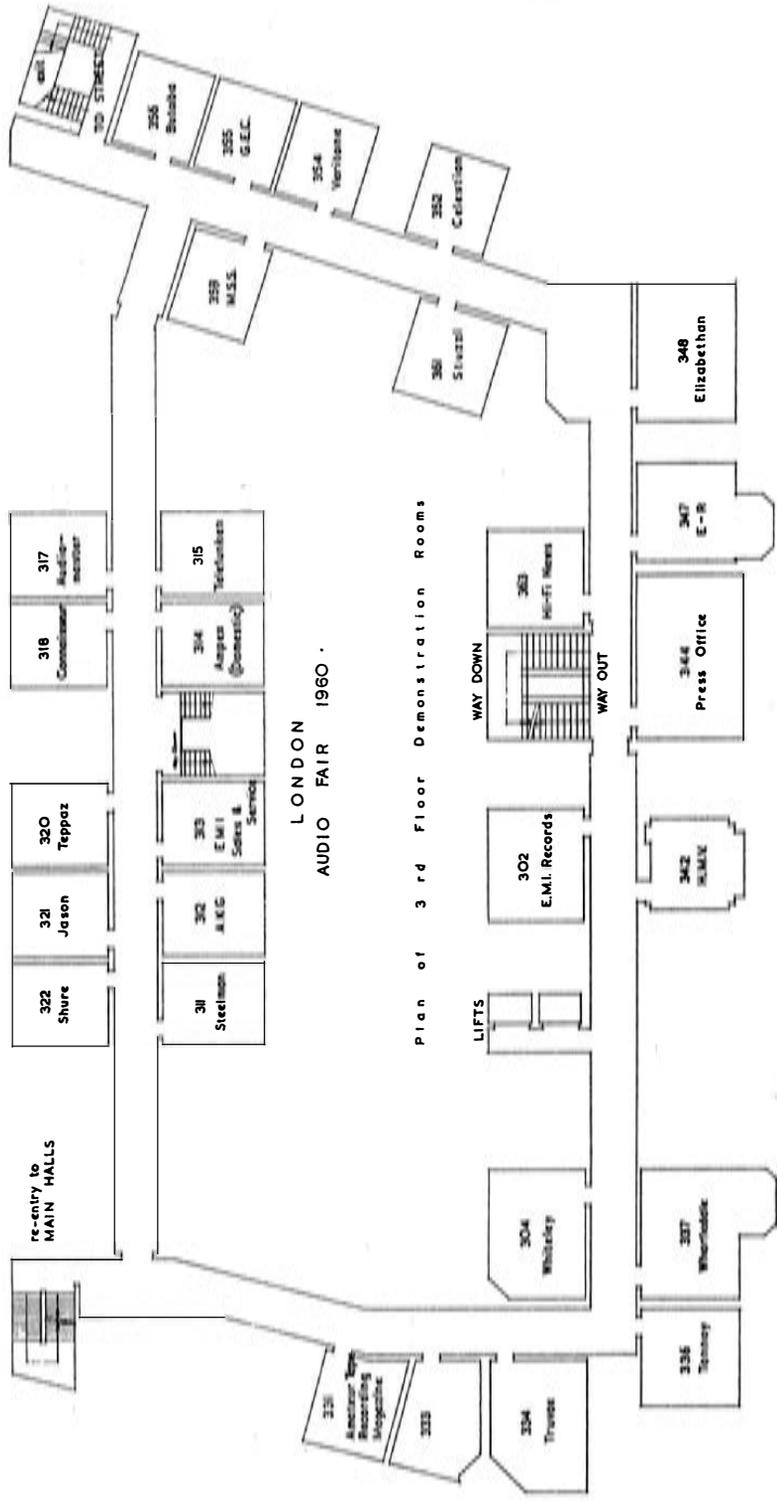
WAY OUT

TO STAIRS



LONDON
AUDIO FAIR 1960

Plan of 2nd Floor Demonstration Rooms.



LONDON FAIR 1960

Plan of 3rd Floor Demonstration Rooms

Re-entry to MAIN HALLS

322 Shure

321 Jason

320 Teppaz

318 Combs

317 Audio-mentor

301 Steelman

302 J.K.C.

303 E.M.I. Sales & Service

304 Ampex (General)

305 Telefunken

309 M.S.L.

308

307

306

305 G.E.C.

304 Veritone

303

302 Collection

328 American News Recording Magazine

308

304 Truette

304 Whittaker

LIFTS

302 E.M.I. Records

303 Hi-Fi News

WAY DOWN

WAY OUT

335 Tannoy

337 Whitbread

342 I.M.S.L.

344 Press Office

347 E-R

348 Elizabethan

INDEX OF EXHIBITORS

BRAND NAME	EXHIBITOR	BOOTH No.	ROOM No.	OFFICE	PRODUCTS
ACOS	Cosmocord Limited, Eleanor Cross Road, Waltham Cross, Herts. (Waltham Cross 25206)	65	111	109	Microphones and Accessories, Pick-ups, Pick-up arms, Pick-up cartridges, Pick-up Styli.
ACOUSTICAL	Acoustical Manufacturing Co. Ltd., Huntingdon, Hunts. (Huntingdon 361)	63	149	148	Amplifiers and Pre-Amplifiers, Loudspeakers (Electrostatic), Tuners (A.M.), Tuners (F.M.).
AKG	Akustische u. Kinogerate G.m.b.H., Nobilegasse 50, Vienna XV, Vienna. <i>U.K. Agents:</i> Politechna (London) Ltd., 357, Euston Road, London, N.W.1. (EUS 5851)	34	312	—	Microphones and accessories.
AMATEUR TAPE RECORDING	Associated British Tape Recording Clubs Ltd., 145, Fleet Street, London, E.C.4. (FLE 7732)	67	—	331	Publications.

BRAND NAME	EXHIBITOR	BOOTH No.	ROOM No.	OFFICE	PRODUCTS
AMPEX (Domestic)	Ampex International S.A., 1, Rue des Pilettes, Fribourg, Switzerland.	28	314		Tape Recorders (Domestic), Pre-recorded tapes, Reproducers.
AMPEX (Professional)	Rank Cintel Limited, Worsley Bridge Road, London, S.E.26. (HIT 4600)	27	252	251	Amplifiers and Pre-Amplifiers, Mixers, Tape Recorders (Professional), Transistor Amplifiers.
ARMSTRONG	Armstrong Wireless & Television Co. Ltd., Warlters Road, London, N.7. (NOR 3213)	26	120	—	Amplifiers and Pre-Amplifiers, Radio Chassis, Tuners (A.M.), Tuners (F.M.), Tape Pre-Amplifier.
AUDIOMASTER	W. & N. Electronics, 80/2, Uxbridge Road, London, W.5. (EAL 4774)	19	317	—	Amplifiers and Pre-Amplifiers, Cabinets, Loudspeaker Enclosures, Loudspeaker Systems, Mixers, Tape Recorders (Domestic), Tape Recorders (Professional), Tuners A.M. & F.M.
AUDIO FIDELITY	Audio Fidelity (England) Ltd., 44, Crawford Street, London, W.1. (PAD 2103)	1	112	—	Records.
AVANTIC	Beam-Echo Limited, 13, South Molton Street, London, W.1. (MAY 1039)	62	121	124	Amplifiers and Pre-Amplifiers, Loudspeaker Systems, Tuners (A.M.), Tuners (F.M.).
BASF	Badische Anilin & Soda Fabrik A.G., Ludwigshafen am Rhein, Germany. U.K. Agents: F. A. Hughes & Co. Ltd., 4, Stanhope Gate, London, W.1. (HYD 6080)	2	115	—	Magnetic Recording Tape and Accessories.
BBC	British Broadcasting Corporation, Broadcasting House, London, W.1. (LAN 4468)	72	144/6	—	Display and demonstration of studio recording and monitoring apparatus.
BRENELL	Brenell Engineering Co. Ltd., 1a, Doughty Street, London, W.C.1. (HOL 7358)	8	117	116	Amplifiers and Pre-Amplifiers, Mixers, Tape decks, Tape Recorders (Domestic).
BSRA	British Sound Recording Association, 68, All Souls Avenue, London, N.W.10.	First Floor	Gallery	141	Special Display — SOUND IN THE SERVICE OF MAN.

BRAND NAME	EXHIBITOR	BOOTH No.	ROOM No.	OFFICE	PRODUCTS
BUTOBA	Schwarzalder Uhrwerke-Fabrik Burger KG, Schonach, Germany. <i>U.K. Agents:</i> Denham & Morley Ltd., Denmore House, 173/5, Cleveland Street, W.1. (EUS 3656)	40	356	—	Tape Recorders (Domestic).
CELESTION	Celestion Limited, Ferry Works, Thames Ditton, Surrey, (Emberbrook 3402)	51	352	351	Loudspeakers (Dynamic), Loudspeaker Systems, Public Address Equipment, Transformers.
CHAPMAN	C. T. Chapman (Reproducers) Ltd., Chapel Lane, High Wycombe, Bucks. (High Wycombe 2474)	37	220	209	Amplifiers and Pre-Amplifiers, Radio Chassis, Tuners (A.M.), Tuners (F.M.).
CHITNIS	Gopal G. Chitnis, Westfaelische Strasse 38, Berlin-Halensee, West Germany. <i>U.K. Agents:</i> Chitnis Electronics Ltd. 1, Long Acre, W.C.2. (COV 2052)	11	113	—	Microphones and accessories, Tape Recorders (Domestic).
CONNOISSEUR	A. R. Sugden & Co. (Engineers) Ltd., Market Street, Brighouse, Yorks. (Brighouse 2142)	14	318	324	Amplifiers and Pre-Amplifiers, Cabinets, Disc Recorders, Loudspeaker Enclosures, Pick-ups, Pick-up Arms, Pick-up Heads, Pick-up Styli, Transcription Turntables.
DECCA	Decca Radio & Television, Ingate Place, Queenstown Road, London, S.W.8. (MAC 6677)	61	159	150	Pick-ups, Pick-up Arms, Pick-up Cartridges, Publications, Records, Record Reproducers.
DESIGN FURNITURE	Design Furniture Limited, Carnwath Road, London, S.W.6. (REN 2217)	32	211	—	Cabinets, Loudspeaker Enclosures.
DYNATRON	Dynatron Radio Limited, St. Peters Road, Furze Platt, Maidenhead, Berks. (Maidenhead 5151)	60	222	223	Loudspeaker Systems, Record Reproducers.
EKCO	E. K. Cole Limited, Ekco Works, Southend-on-Sea, Essex. (Southend 49491)	31	256	—	Record Reproducers.
ELIZABETHAN	E. A. P. (Tape Recorders) Ltd., Bridge Close, Oldchurch Road, Romford, Essex. (Romford 62366)	18	348	362	Microphones and accessories, Tape Recorders (Domestic), Tuners (A.M.), Tuners (F.M.).

BRAND NAME	EXHIBITOR	BOOTH No.	ROOM No.	OFFICE	PRODUCTS
E.M.I.	E. M. I. Sales & Service Ltd., Hayes, Middlesex. (SOU 2468)	59	313	301	Magnetic Recording Tape, Record Reproducers, Tape Recorders (Professional).
E.M.I. RECORDS	E. M. I. Records Ltd., 8/11, Great Castle Street, London, W.1. (LAN 5544)	15	302	—	Pre-recorded tapes, Publications, Records.
E-R	Electronic Reproducers Ltd., Porters Wood, Valley Road Industrial Estate, St. Albans, Herts. (St. Albans 50555)	12	347	346	Pick-ups, Pick-up Arms, Pick-up Cartridges, Pick-up Styli.
FERROGRAPH	British Ferrograph Recorder Co. Ltd., 131, Sloane Street, London, S.W.1. (SLO 2214)	29	234	—	Tape-decks, Tape Recorders (Domestic), Tape Recorders (Semi-Professional), Continuous Tape Players, Head Demagnetisers.
FI-CORD	Fi-Cord Limited, 40a, Dover Street, London, W.1. (HYD 3448)	9	254	—	Tape Recorders (Domestic).
GARRARD	The Garrard Engineering & Manufacturing Co. Ltd., Newcastle Street, Swindon, Wilts. (Swindon 5381)	7	218	226	Automatic Record Changers, Pick-ups, Pick-up Arms, Pick-up Cartridges, Pick-up Styli, Tape-decks, Transcription Turntables.
G.E.C.	General Electric Company, Magnet House, Kingsway, London, W.C.2. (TEM 8000)	25	355	—	Amplifiers and Pre-Amplifiers, Loudspeakers (Dynamic), Loudspeaker Enclosures, Loudspeaker Systems, Microphones and accessories, Mixers, Record Reproducers, Transformers, Tuners (F.M.), Valves.
GOLDRING	The Goldring Manufacturing Co. (G.B.) Ltd. 486/488, High Road, London, E.11. (LEY 8343)	53	214	—	Pick-ups, Pick-up Arms, Pick-up Cartridges, Pick-up Styli, Transcription Turntables, Record cleaning pads, Stylus balance,
GOODMANS	Goodmans Industries Ltd., Axiom Works, Wembley, Middlesex. (WEM 1200)	13	242	241 243	Loudspeakers (Dynamic), Loudspeaker Enclosures, Loudspeaker Systems.
THE GRAMOPHONE	The Gramophone, The Glade, Green Lane, Stanmore, Middlesex. (Grimsdyke 389)	—	—	118	Publications.

BRAND NAME	EXHIBITOR	BOOTH No.	ROOM No.	OFFICE	PRODUCTS
GRAMPIAN	Grampian Reproducers Ltd., Hanworth Trading Estate, Feltham, Middlesex. (FEL 2657)	16	161	162	Amplifiers and Pre-Amplifiers, Loudspeakers (Dynamic), Loudspeaker Enclosures, Microphones and accessories, Mixers, Public Address Equipment, Recording Cutters, Record Reproducers, Transistor Amplifiers.
GRUNDIG	Grundig (Great Britain) Ltd., Newlands Park, Sydenham, London, S.E.26. (SYD 2211)	46	202	—	Loudspeaker Systems, Magnetic Recording Tape, Microphones and accessories, Publications, Radio Chassis, Recording Heads, Record Reproducers, Tape-decks, Tape Recorders (Domestic).
HI-FI NEWS	Classical Record News, 99, Mortimer Street, London, W.1. (MUS 3967)	69	—	363	Publications.
H.M.V.	The Gramophone Company Limited, Hayes, Middlesex. (SOU 2468)	56	342	341 343	Amplifiers and Pre-Amplifiers, Cabinets, Loudspeakers (Dynamic), Loudspeaker Enclosures, Loudspeaker Systems, Record Reproducers, Tape Recorders (Domestic).
IRISH BRAND	Orr Industries, Inc., Opelika, Alabama, U.S.A. U.K. Agents: Wilmex Limited, 131, Sloane Street, London, S.W.1. (SLO 0621)	3	—	—	Magnetic Recording Tape.
JASON	The Jason Motor & Electronic Co., 3-4, Gt. Chapel Street, London, W.1. (GER 0273)	71	321	—	Amplifiers and Pre-Amplifiers, Kits, Tuners (A.M.), Tuners (F.M.).
LEAK	H. J. Leak & Co. Ltd., Brunel Road, Westway Factory Estate, London, W.3. (SHE 1173)	70	248	—	Amplifiers and Pre-Amplifiers, Loudspeaker Systems, Pick-ups, Tuners (F.M.).
LOWTHER	The Lowther Manufacturing Company, Lowther House, St. Mark's Road, Bromley, Kent. (RAV 5225)	64	204	239	Amplifiers and Pre-Amplifiers, Loudspeakers (Dynamic), Loudspeaker Enclosures, Loudspeaker Systems, Pick-ups, Radio Chassis, Transcription Turntables, Transistor Amplifiers, Tuners (F.M.).
LUSTRAPHONE	Lustraphone Ltd., St. George's Works, Regent's Park Road, London, N.W.1. (PRI 8844)	24	—	143	Amplifiers and Pre-Amplifiers, Microphones and accessories, Mixers, Public Address Equipment, Transistor Amplifiers, Transformers.
MINIVOX	Challen Instrument Co., 2, St. Michaels Road, London, S.W.9. (GIP 4381)	6	212	—	Disc Recorders, Tape Recorders (Domestic), Transistor Amplifiers.

BRAND NAME	EXHIBITOR	BOOTH No.	ROOM No.	OFFICE	PRODUCTS
M.S.S.	M. S. S. Recording Company Ltd. 21, Bloomsbury Street, London, W.C.1. (MUS 1600)	10	359	350	Amplifiers and Pre-Amplifiers, Disc Recorders, Loudspeaker Enclosures, Magnetic Recording Tape, Mixers, Recording Heads, Tape Recorders (Domestic), Tape Recorders (Professional), Transcription Turntables.
MULLARD	Mullard Limited, Mullard House, Torrington Place, London, W.C.1. (LAN 6633)	47	233	232	Publications, Transistors, Valves.
PAMPHONIC	Pamphonic Reproducers Limited, 17, Stratton Street, London, W.1. (GRO 1926)	55	217	225	Amplifiers and Pre-Amplifiers, Loudspeakers (Dynamic), Loudspeaker Systems, Mixers, Public Address Equipment, Record Reproducers, Tuners (A.M.), Tuners (F.M.).
PYE	Pye High Fidelity Division, 65, Fairview Road, London, S.W.16. (POL 9441)	68	215	216	Amplifiers and Pre-Amplifiers, Cabinets, Loudspeakers (Dynamic), Loudspeaker Enclosures, Tuners (A.M.), Tuners (F.M.).
PYE RECORDS	Pye Group Records (Sales) Ltd., 10a, Chandos Street, London, W.1. (LAN 0521)	52	152	151	Records.
RECORD HOUSING	N. & S. B. Field & Co. Ltd., Brook Road, London, N.22. (BOW 7487)	30	237	—	Cabinets, Loudspeaker Enclosures.
REFLECTOGRAPH	Multimusic Ltd., Maylands Avenue, Hemel Hempstead, Herts. (Boxmoor 3636)	42	236	235	Tape-decks, Tape Recorders (Domestic) Tape Recorders (Professional).
RESLO	Reslosound Ltd., London Road, Romford, Essex. (Romford 49087)	33	221	224	Loudspeakers (Dynamic), Microphones and accessories, Public Address Equipment, Transistor Amplifiers, Transformers.
ROGERS	Rogers Developments (Electronics) Ltd. 4/14, Barmeston Road, London, S.E.6. (HIT 7424)	20	213	—	Amplifiers and Pre-Amplifiers, Cabinets, Loudspeaker Systems, Tuners (F.M.).
SCOTCH BRAND	Minnesota Mining & Manufacturing Co. Ltd., 3M House, Wigmore Street, London, W.1. (HUN 5522)	23	259	—	Magnetic Recording Tape.

BRAND NAME	EXHIBITOR	BOOTH No.	ROOM No.	OFFICE	PRODUCTS
SHURE	Shure Brothers Incorporated, 222, Hartrey Avenue, Evanston, Illinois, U.S.A. <i>U.K. Agent: J. W. Maunder,</i> 95, Hayes Lane, Beckenham, Kent. (BEC 7413)	43	322	323	Microphones and accessories, Pick-ups, Pick-up Arms, Pick-up Cartridges, Pick-up Styli.
SIMON	Simon Equipment Ltd., 48, George Street, London, W.1. (WEL 2371)	36	255	—	Microphones, Tape Recorders (Domestic), Tape Recorders (Semi-Professional).
SPECTONE	Specto Limited, Vale Road, Windsor, Berks. (Windsor 1241)	21	114	—	Tape Recorders (Domestic).
STC	Standard Telephones & Cables Ltd., Connaught House, 63, Aldwych, London, W.C.2. (HOL 8765)	35	—	240	Amplifiers and Pre-Amplifiers, Loudspeaker Enclosures, Loudspeaker Systems, Microphones and accessories, Mixers, Public Address Equipment, Valves.
STEELMAN	Redifon Ltd., Broomhill Road, London, S.W.18. (VAN 7281)	44	311	309	Record Reproducers, Tape Recorders (Domestic).
STUZZI	Recording Devices Limited, 44, Southern Row, Kensington, London, W.11. (LAD 4775)	39	361	—	Microphones and accessories, Mixers, Tape Recorders (Domestic).
TANNOY	Tannoy Products Limited, Norwood Road, West Norwood, London, S.E.27. (GIP 1131)	45	336	335	Amplifiers and Pre-Amplifiers, Cabinets, Loudspeakers (Dynamic), Loudspeaker Enclosures, Loudspeaker Systems, Pick-up Cartridges, Pick-up Styli.
TELFUNKEN	Telefunken G.m.b.H., Gottinger Chaussee 76, Hannover, Germany. <i>U.K. Agents: Welmec Corporation Ltd.,</i> 147, Strand, W.C.2. (TEM 3357)	50	315	316	Magnetic Recording Tape, Microphones and accessories, Mixers, Tape Recorders (Domestic), Tape Recorders (Professional).
TEPPAZ	Teppaz S. A., 170 Boulevard de la Croix Rouse, Lyon (Rhône), France.	17	320	325	Amplifiers and Pre-Amplifiers, Loudspeakers (Dynamic), Loudspeaker Systems, Pick-ups, Pick-up Arms, Pick-up Cartridges, Pick-up Styli, Public Address Equipment, Records, Record Reproducers, Transistor Amplifiers.
TRIX	Trix Electrical Co. Ltd., 1-5, Maple Place, London, W.1. (MUS 5817)	49	261	262	Amplifiers and Pre-Amplifiers, Loudspeaker Systems, Microphones and accessories, Mixers, Public Address Equipment, Record Reproducers, Tape Recorders (Domestic), Transistor Amplifiers, Tuners (F.M.).

BRAND NAME	EXHIBITOR	BOOTH No.	ROOM No.	OFFICE	PRODUCTS
TRUVOX	Truvox Limited, Neasden Lane, London, N.W.10. (GLA 6455)	57	334	—	Amplifiers and Pre-Amplifiers, Recording Heads, Tape-decks, Tape Recorders (Domestic), Stethoset Headphones, Radio Jacks.
TSL	Technical Suppliers Limited, 63, Goldhawk Road, London, W.12. (SHE 2581)	48	247	—	Loudspeakers (Dynamic), Loudspeaker Enclosures, Loudspeaker Systems, Microphones and accessories, Mixers, Pre-recorded Tapes, Tape Recorders (Domestic), Tuners (F.M.).
VERITONE	Veritone Ltd., 16, Station Close, Potters Bar, Middlesex. (Potters Bar 2079)	58	354	—	Mixers, Tape Recorders (Domestic), Tuners (A.M.).
VORTEXION	Vortexion Limited, 257/263, The Broadway, London, S.W.19. (LIB 2814)	54	147	163	Amplifiers and Pre-Amplifiers, Mixers, Public Address Equipment, Tape Recorders (Domestic), Tape Recorders (Professional), Transformers.
WALTER	Walter Instruments Ltd., Garth Road, Morden, Surrey. (DER 4421)	5	122	123	Tape Recorders (Domestic).
WELLINGTON	Wellington Acoustic Laboratories Ltd., Farnham, Surrey. (Farnham 6461)	66	—	—	Loudspeaker Systems, Tape Accessories, Transistor Pre-Amplifiers, Stereo, Pocket Hi-Fi Tester.
WHARFEDALE	Wharfedale Wireless Works Ltd., Idle, Bradford. (Idle 1235)	22	337	339	Loudspeakers (Dynamic), Loudspeaker Enclosures, Loudspeaker Systems, Publications, Public Address Equipment, Transformers, Volume Controls.
W.B. STENTORIAN	Whiteley Electrical Radio Co. Ltd., Radio Works, Victoria Street, Mansfield, Notts. (Mansfield 1762)	4	304	340	Amplifiers and Pre-Amplifiers, Cabinets, Loudspeakers (Dynamic), Loudspeaker Enclosures, Public Address Equipment, Transformers, Tuners (F.M.).
WIRELESS TRADER	Trader Publishing Co. Ltd., Dorset House, Stamford Street, London, S.E.1. (WAT 3333)	41	—	230	Publications.
WIRELESS WORLD	Iliffe & Sons Ltd., Dorset House, Stamford Street, London, S.E.1. (WAT 3333)	38	—	231	Publications.

ON SHOW HERE AT THE AUDIO FAIR

<i>PRODUCTS</i>	<i>TRADE NAME OF MANUFACTURER</i>	<i>PRODUCTS</i>	<i>TRADE NAME OF MANUFACTURER</i>
AMPLIFIERS AND PRE-AMPLIFIERS	Acoustical, Ampex (Professional), Armstrong, Audiomaster, Avantic, Brenell, Chapman, Connoisseur, G.E.C., Grampian, H.M.V., Jason, Leak, Lowther, Lustraphone, M.S.S., Pamphonic, Pye, Rogers, STC, Tannoy, Teppaz, Trix, Truvox, Vortexion, W.B. Stentorian.	PICK-UP STYLI	Acos, Connoisseur, E-R, Garrard, Goldring, Shure, Tannoy, Teppaz
AUTOMATIC RECORD CHANGERS	Garrard	PRE-RECORDED TAPES	Ampex (Domestic), E.M.I. Records, TSL
CABINETS	Audiomaster, Connoisseur, Design Furniture, H.M.V., Pye, Record Housing, Rogers, Tannoy, W.B. Stentorian	PUBLICATIONS	Amateur Tape Recording, Decca, E.M.I. Records, The Gramophone, Grundig, Hi-Fi News, Mullard, Wharfedale, Wireless Trader, Wireless World
CONTINUOUS TAPE PLAYERS	Ferrograph	PUBLIC ADDRESS EQUIPMENT	Celestion, Grampian, Lustraphone, Pamphonic, Reslo, STC, Teppaz, Trix, Vortexion. Wharfedale, W.B. Stentorian
CUTTING HEADS	Connoisseur, Grampian	RADIO CHASSIS	Armstrong, Chapman, Grundig, Lowther
DISC RECORDERS	Connoisseur, Grampian, Minivox, M.S.S.	RECORD CLEANERS	Acos, Goldring
HEAD DEMAGNETISERS	Ferrograph	RECORDING HEADS	Grundig, M.S.S., Truvox
LOUDSPEAKERS (DYNAMIC)	Celestion, G.E.C., Goodmans, Grampian, H.M.V., Lowther, Pamphonic, Pye, Reslo, Tannoy, Teppaz, TSL, Wharfedale, W.B. Stentorian	RECORDS	Audio Fidelity, Decca, E.M.I. Records, Pye Records, Teppaz
LOUDSPEAKERS (ELECTROSTATIC)	Acoustical	RECORD REPRODUCERS	Decca, Dynatron, Ekco, E.M.I., G.E.C., Grampian, Grundig, H.M.V., Pamphonic, Steelman, Teppaz, Trix
LOUDSPEAKER ENCLOSURES	Audiomaster, Connoisseur, Design Furniture, G.E.C., Goodmans, Grampian, H.M.V., Lowther, M.S.S., Pye, Record Housing, STC, Tannoy, Teppaz, TSL, Wharfedale, W.B. Stentorian	STYLUS BALANCES	Garrard, Goldring
LOUDSPEAKER SYSTEMS	Audiomaster, Avantic, Celestion, Dynatron, G.E.C., Goodmans, Grundig, H.M.V., Leak, Lowther, Pamphonic, Rogers, STC, Tannoy, Teppaz, Trix, TSL, Wellington, Wharfedale	TAPE-DECKS	Brenell, Ferrograph, Garrard, Grundig, Reflectograph, Truvox
MAGNETIC RECORDING TAPE	BASF, E.M.I., Grundig, Irish Brand, M.S.S., Scotch Brand, Telefunken	TAPE ERASERS	Wellington
MICROPHONES AND ACCESSORIES	Acos, AKG, Chitnis, Elizabethan, G.E.C., Grampian, Grundig, Lustraphone, Reslo, Shure, Simon, STC, Stuzzi, Telefunken, Trix, TSL	TAPE RECORDERS —DOMESTIC	Ampex (Domestic), Audiomaster, Brenell, Butoba, Chitnis, Elizabethan, Ferrograph, Fi-Cord, Grundig, H.M.V., Minivox, M.S.S., Reflectograph, Simon, Spectone, Steelman, Stuzzi, Telefunken, Trix, Truvox, TSL, Veritone, Vortexion, Walter
MIXERS	Ampex (Professional), Audiomaster, Brenell, G.E.C., Grampian, Lustraphone, M.S.S., Pamphonic, STC, Stuzzi, Telefunken, Trix, TSL, Veritone, Vortexion	TAPE RECORDERS —PROFESSIONAL	Ampex (Professional), Audiomaster, E.M.I., Ferrograph, M.S.S., Reflectograph, Simon, Telefunken, Vortexion
PICK-UPS	Acos, Connoisseur, Decca, E-R, Garrard, Goldring, Leak, Lowther, Shure, Teppaz	TRANSCRIPTION TURNTABLES	Connoisseur, Garrard, Goldring, Lowther, M.S.S.
PICK-UP ARMS	Acos, Connoisseur, Decca, E-R, Garrard, Goldring, Shure, Teppaz	TRANSFORMERS	Celestion, G.E.C., Lustraphone, Reslo, Vortexion, Wharfedale, W.B. Stentorian
PICK-UP CARTRIDGES	Acos, Decca, E-R, Garrard, Goldring, Shure, Tannoy, Teppaz	TRANSISTORS	Mullard
		TRANSISTOR AMPLIFIERS	Ampex (Professional), Grampian, Lowther, Lustraphone, Minivox, Reslo, Teppaz, Trix, Wellington
		TUNERS (A.M.)	Acoustical, Armstrong, Audiomaster, Avantic, Chapman, Elizabethan, Jason, Pamphonic, Pye, Veritone
		TUNERS (F.M.)	Acoustical, Armstrong, Audiomaster, Avantic, Chapman, Elizabethan, G.E.C., Jason, Leak, Lowther, Pamphonic, Pye, Rogers, Trix, TSL, W.B. Stentorian
		VALVES	G.E.C., Mullard, STC

AUDIO *Fare*

A MAGAZINE CATALOGUE FOR AUDIOPHILES

High Quality Sound in the B.B.C.

The Art on the Sleeve.
The Story of Stereo.

Converting to Stereo.
Stereo and the musician.

The Tape Recorder Boom is on!
Transatlantic Trends

Directory of Audio Dealers.
Advertisers Index.

Edited by C. Rex-Hassan

Contributions collated by J. W. Maunder

HIGH QUALITY SOUND

by Hugh Greatorex

THE BBC has always been in the forefront of world broadcasting organisations in regard to the technical quality of its transmissions. The maintenance of this position entails a continuous programme of research and development work to evolve new techniques, and in many cases the equipment required.

The design of studios and microphones, sound recording and reproducing equipment and a variety of control, switching and monitoring equipment is subject to a process of continuous evolution.

The introduction of the BBC's VHF sound broadcasting service has made the results of this work in the form of improved reception and quality available to a wide circle of listeners.

At this Audio Fair of 1960, examples will be shown of equipment developed by the BBC for the specialised requirements of broadcasting. Some of these are illustrated on the following pages.

The BBC is carrying out experiments in stereophonic broadcasting in which the left- and right-hand channels are carried by separate transmitters. Systems for broadcasting the two channels from a single VHF transmitter are being actively investigated, since a system of this type would be needed for a public service of stereophonic transmissions.

The European Broadcasting Union has set up a Working Party to study stereophonic broadcasting, consisting of experts drawn from a number of countries in Western Europe, including one from the BBC. The problems are also being studied by the C.C.I.R. (International Radio Consultative Committee).

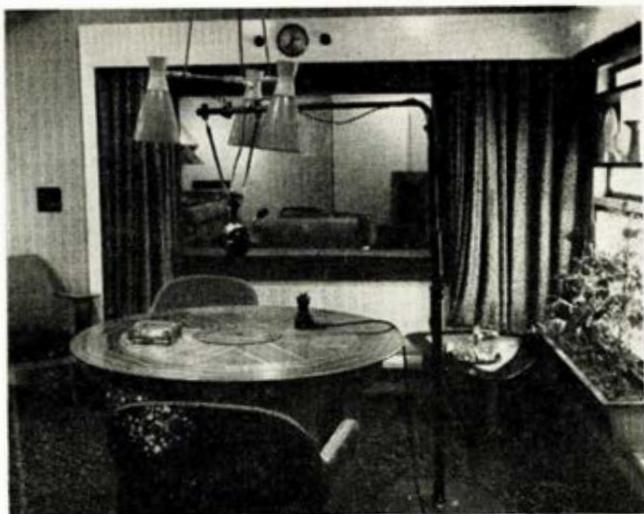


STUDIO DESIGN

In Studio 1 at Savoy Hill in 1928 the "balancer" sat in his silence cabinet and monitored the programme on headphones. The heavy drapes resulted in very dead studio acoustics, which were modified for transmission by the use of artificial reverberation.

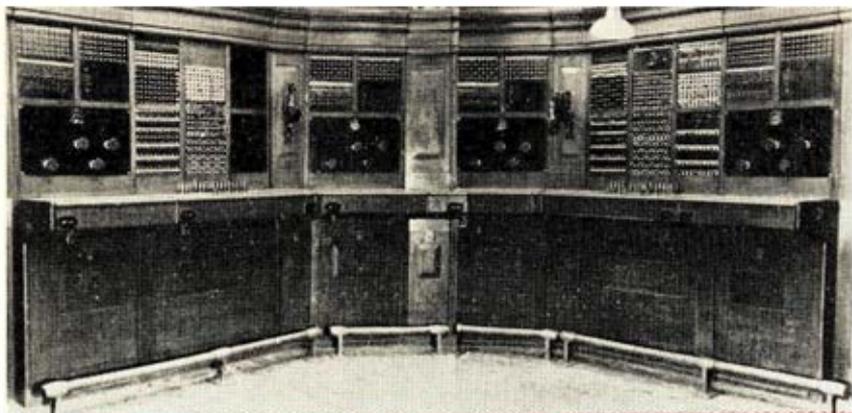
IN THE B.B.C.

Present-day practice as shown by this Talks Studio in Broadcasting House, London, is to provide a separate control cubicle for the studio manager with a soundproof window giving a view of the studio. Here the programme is monitored on a high-quality loud-speaker. The present-day BBC ribbon microphone can be compared with the monster "meat-safe" microphone used at Savoy Hill.



A modern BBC orchestral studio at Maida Vale, London, showing the BBC Symphony Orchestra at rehearsal.





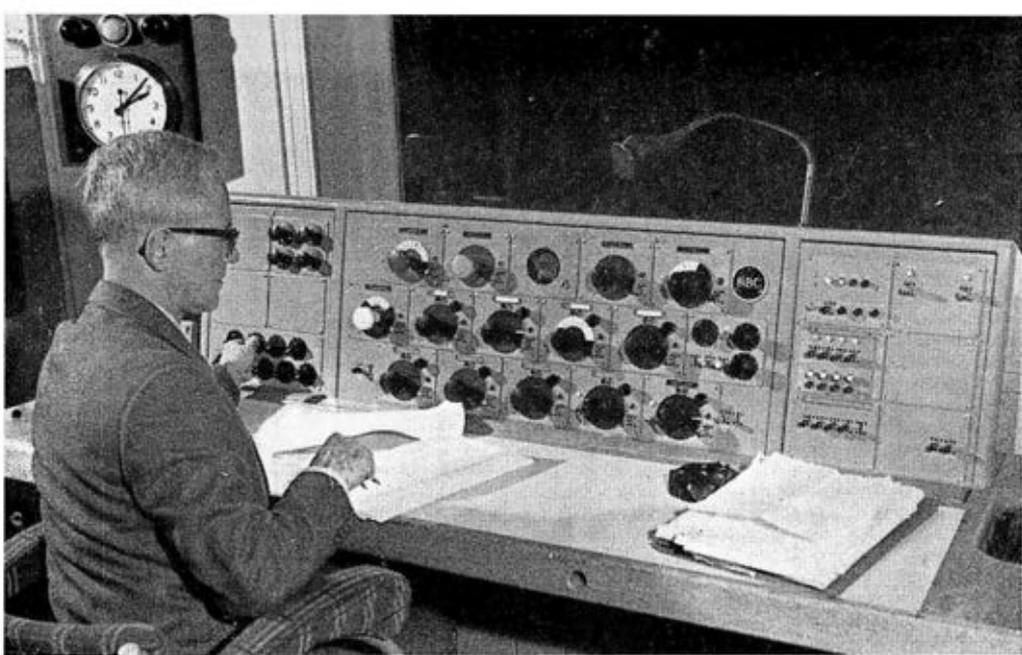
**CONTROL ROOM
DEVELOPMENT**

An example of a Regional Control Room of thirty years ago at Broadcasting House, Manchester, and the modern control room that has replaced it.



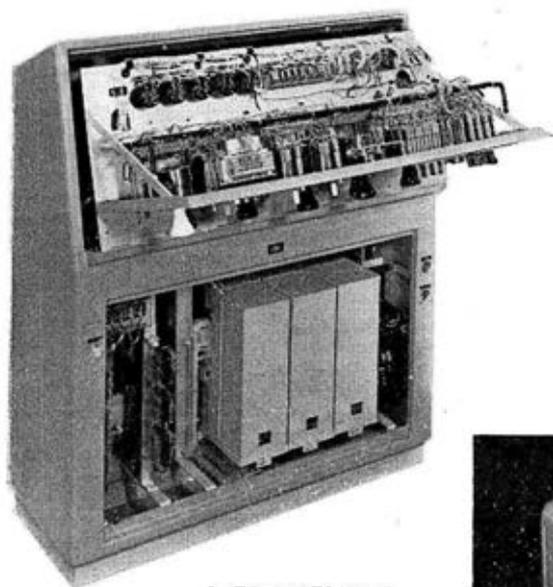
More ambitious is the new Control Room at Bush House, London, which handles programmes for BBC's Overseas and European Services. The equipment designed by BBC engineers, provides remotely controlled switching for the connection of 150 sources to 132 outgoing routes. Programmes in the Overseas and European Services total more than 82 hours a day.





STUDIO CONTROL EQUIPMENT

A Studio Manager at the control panel adjusts the volume of the outgoing programme and the output of the various microphones in the studio. The equipment shown is of BBC design, and is constructed on the unit principle to suit the size of studio and the facilities required. A separate rack houses the associated amplifiers, which have been reduced to three standard types.



INTERNATIONAL STANDARD A-TONE GENERATOR

This equipment has been designed by the BBC for use in studios. It produces a note of 440 c/s (the international standard of musical pitch) with a suitable amount of harmonics to facilitate orchestral tuning.



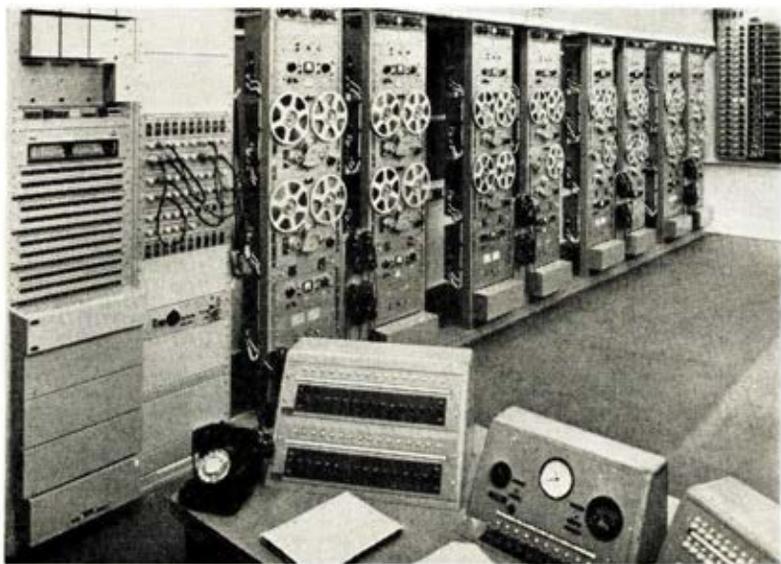


BBC RECORDINGS

In the BBC, approximately 50 per cent. of the programme output is recorded in advance; this figure is much smaller than that for most comparable organisations.

Disk recordings are made on this BBC designed equipment, which operates either at 78 r.p.m. or 33½ r.p.m. The recordings are made on cellulose-coated disks which can be replayed immediately. In 1959, 108,000 disks were recorded for BBC programmes, although the main recording load is now carried by the magnetic tape system.

The Reproducing Desk of BBC design will play BBC recordings and commercial gramophone records at

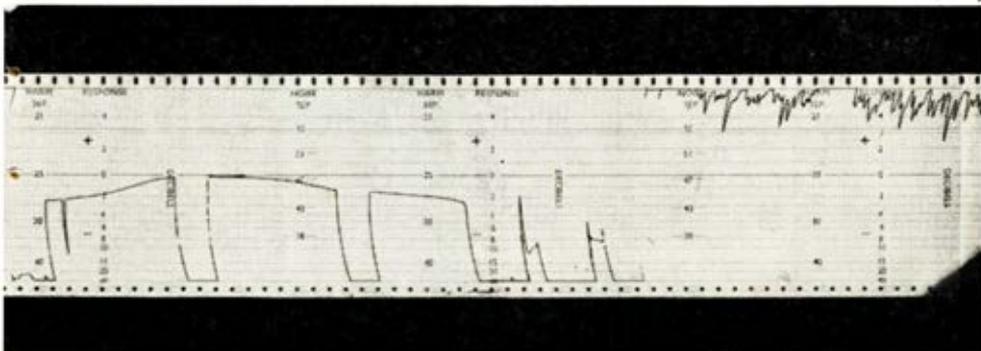
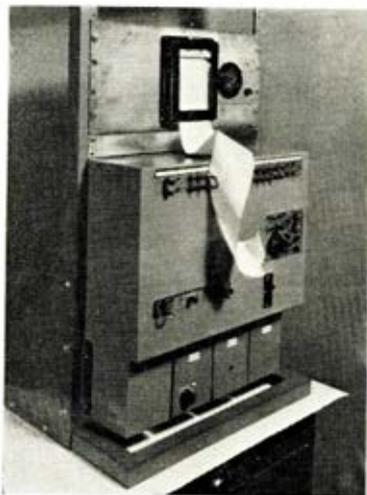


78, 45 or 33½ r.p.m. It has an optical groove-locating device and embodies a number of special features which are the subjects of BBC patent applications.

The Central Tape Recording Room is in Broadcasting House, London. The recording machines can be started and stopped by remote control from certain studios to which they are connected as required. Standard 2,400 ft. spools of $\frac{1}{4}$ in. plastic tape are used; BBC standard tape speed is 15 inches per second. During 1959, recordings were made on 24,000 miles of magnetic tape. Most of these tapes can be used again once the material recorded is no longer required. A BBC tape reclamation unit has, therefore, been established for testing and repairing tapes; it reconditions and returns to service for future use some 450 miles of tape each week.

AUTOMATIC LINE TESTING EQUIPMENT

A continual check must be kept on the performance of the 25,000 miles of music lines rented by the BBC from the Post Office and the problem becomes more acute as the number of unattended transmitters increases. The automatic line tester shown here can be set to make a complete frequency run on a circuit, test it for noise level and distortion and make a record of the results. Charts are collected from unattended stations at suitable intervals.



Superb equipment by

Connoisseur

for stereo or monaural

Stereo Amplifier and Control Unit Type S66.

Twin channel, delivering 7.5 watts per channel with ultra linear output stage. Inputs for P.U., Tape and Radio, sensitivity being 6m.V. Separate treble and bass controls.



2-speed Transcription Motor.

33 $\frac{1}{3}$ rpm and 45 rpm. Full 12in. turntable is lathe turned. New nylon graphite bearings. Synchronous motor dynamically balanced. Neon indicator on/off warning light.



Stereo Pickup Type CSI.

Pickup arm fitted with integral lifting device. The pickup head employs miniature ceramic units, frequency range 20-16,000 c.p.s. output 20m.V with channel separation of 20-25 db. Downward pressure 3 $\frac{1}{2}$ -4 grams. Diamond stylus. Will accept Mark II monaural heads.

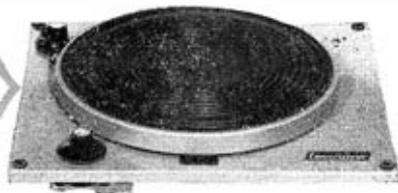


Stereo Pickup Mark III.

Designed to accept both monaural and stereo heads. Adjustable for heights of various turntables. Pickup head specification identical with the Type CSI.

Variable 3-speed Motor.

For 33 $\frac{1}{3}$, 45 and 78 rpm. Stroboscope fitted with internal light source. Synchronous motor dynamically balanced resiliently mounted. Mechanical speed change giving 4% variation on all speeds.



A. R. SUGDEN & CO (ENGINEERS) LTD.
MARKET STREET BRIGHOUSE YORKSHIRE



by Peter Sieber
B.Sc., A.M.I.E.E., M.I.P.A.

IT comes almost as a shock when one recalls that it is not so many years since the traditional wrapper for a gramophone record was a manilla envelope, with hole in middle, and—all too soon—tattered edges at corners. Right from the first, however, LP records have been clothed with a dignity that becomes their greater value, and the splendidly colourful sleeves of LP records quickly became an established and welcome feature of the record collector's library.

There have been criticisms that these sleeves are simply a sales gimmick, made unnecessarily elaborate to catch the eye in the shop, with the buyer of the record ultimately footing the bill for this costly packaging. This kind of argument is less than fair to the record manufacturer. ● Of course the recording firms package their products in a pleasant form to increase sales; in this respect they do not differ from all other enlightened manufacturers. The first function of the sleeve, however, is to protect the record. LPs are not breakable, but they are sensitive to scratching and must be guarded against dust. The LP disc is valuable, and has a useful life of many years, so that the container must stand up to frequent use over a long period of time. In order to achieve this protection, most records have both a thin inner board or plastic sleeve and an outer, thicker sleeve. Most sleeves are coated with plastic on the outside for extra wear. The notes printed on the backs of

these sleeves are a useful addition; they are compiled by experts, and the result of detailed study. A great part of the total cost of sleeves thus lies in essential protection, and functional printing of notes and titles—however plain. Very few record buyers would blame the makers for spending comparatively little more to make their sleeves coloured.

The LP sleeve presented an interesting challenge to the graphic designer. Here was a brand new medium for his art: square and therefore unusual format; a new and intriguing subject; vast scope and, as it turned out, a tremendous future.

A record case is somewhere in between a book jacket and a poster, with something of a showcard and the best of packaging thrown in. It required from the designers a new approach and a new imagination—especially with the earlier LPs when no pattern had been established. At first, a large proportion of all sleeves

THE ART



Fig. 1



Fig. 2



Fig. 3



Fig. 4

relied on design and finished artwork created by the designer or according to his "visual." In more recent years there has been increasing use of designs employing photography. Many different designers have used many different methods, but there are two basic groups of approach: First, the sleeve can illustrate the artists, performers or, more rarely, the composer of the work. Secondly, the sleeve can in some way convey the mood, the feeling, the period or the setting of the recorded work, or symbolise it by some visual element that evokes the atmosphere of the music.

Sleeves in the first group, those featuring the performers, naturally tend to rely most on photography, and this has resulted in a great number of pleasing covers, for example, *Vaughan and Violins* (Fig. 1), *Marvellous Miller Moods* (Fig. 2), *Sammy Swings* (Fig. 3), *Joni James* (Fig. 4), and *Tops With Lonnie* (Fig. 5), illustrate the results when first-rate designers use first-rate photographs.

Humour can play a merry part in portraying the artists, as shown in *Olde Englyshe* (Fig. 6), a recent "period" piece showing Master Ted Heath in Elizabethan costume (Master



Fig. 5

ON THE SLEEVE

Heath himself is reported to have been delighted with this sleeve).

The second approach—that featuring the musical work—offers even greater scope for creative design, and has led to some outstandingly good sleeves. *Italian Panorama* (Fig. 7), for instance, shows the setting of the music in a most inviting shot; *Schubert's Symphony* (Fig. 8) evokes the period of the work. *Mexican Magic* (Fig. 9) and *The Rite of Spring* (Fig. 10) both use striking photographs in quite unorthodox ways to arrive at particularly pleasing covers. *The Mikado* (Fig. 11) and *Pulcinella Suite* (Fig. 12) rely on exquisite design and artwork, while *Le Coq d'Or* (Fig. 13) uses a strident coq d'or in a superlatively successful sleeve.

One major recording firm has recently started to issue some of its covers with outstanding paintings by some of the world's greatest painters, for example, a fine Van Gogh for *Schubert's "Unfinished" Symphony* (Fig. 14). These do not contain any new design merit, but the meeting of visual and musical masterpieces is a happy one.

Two records of *My Fair Lady* (Figs. 15 and 16) show that both ways—illustrating the performers or sym-

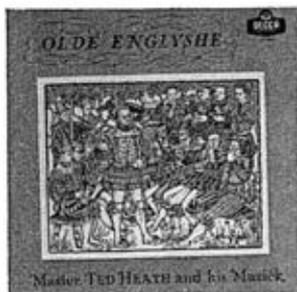


Fig. 6



Fig. 7



Fig. 8



Fig. 10



Fig. 9

THE ART



Fig. 11

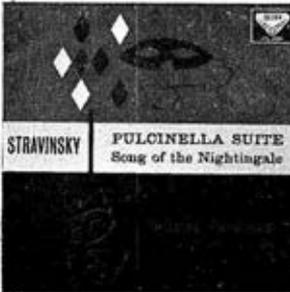


Fig. 12



Fig. 13



Fig. 14



Fig. 15

bolising the work—can lead to the Rome of a pleasant sleeve.

Spoken word records, though numerically amounting to only a small proportion of the total record production, have led to some of the most successful sleeves, perhaps because the spoken word makes a more direct appeal to the designer and artist. A straightforward approach leads to successful sleeves from *Shelley Berman* (Fig. 17), suitably perched on his bar stool, to Cecil Beaton's superb photograph of *John Betjeman* (Fig. 18). The sleeves for a series of nursery rhymes, *Mother Goose*, for example (Fig. 19), have a charm that is bound to please children and adults alike. Arthur Wragg's box designs for *The Works of Shakespeare* (for instance, *Othello*, Fig. 20), are far more than merely interpretive illustrations. Given what, one suspects, was both a most exhilarating and a frightening task, Mr. Wragg has produced works of sensitivity and strength that will have lasting artistic value in their own right.

In a major commercial operation like this, inevitably not every single sleeve comes up to the highest

ON THE SLEEVE

standards. With several years' issues on the market, it is bound to become ever more difficult to find original solutions, and the constant, competitive urge for novelty has occasionally driven a designer beyond good taste, while many sleeves are without a doubt repetitive run-of-the-mill. Nevertheless, the average level is good, and the top is very high indeed. Above all, in a field where the glamour of the performers might make doubtful treatments very plausible, there is on the whole a refreshing absence of vulgarity. To appreciate how true this is, just look at a collection of dust-jackets on cheap books.

The LP sleeve presented a great visual opportunity. When you consider what a vivid and interesting panorama these sleeves have brought to the record shop and to practically every home you visit, you must agree that the record makers who are responsible for the sleeves, and the designers and artists who create them, rose to the occasion. When you reflect that about *two thousand different sleeves are issued every year*, you must marvel at this reservoir of imagination.



Fig. 16



Fig. 17



Fig. 18



Fig. 20



Fig. 19

The World's Best Portable

stereophonic
440
portable
record
player

Stereo tone arm. 4 speed turntable. Automatic stop system. Adaptor Eco 60 for LPs and 78 listening.

3 speakers including 1 tweeter on each one of the 100% revolute Spatio Dynamic baffles.

2 independent controls for treble and bass.

2 contour slide switches.

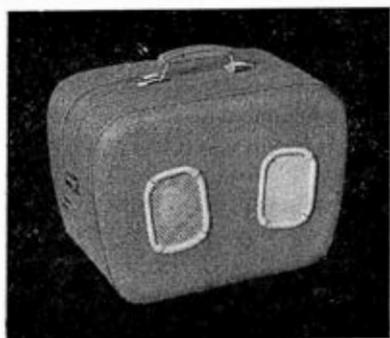
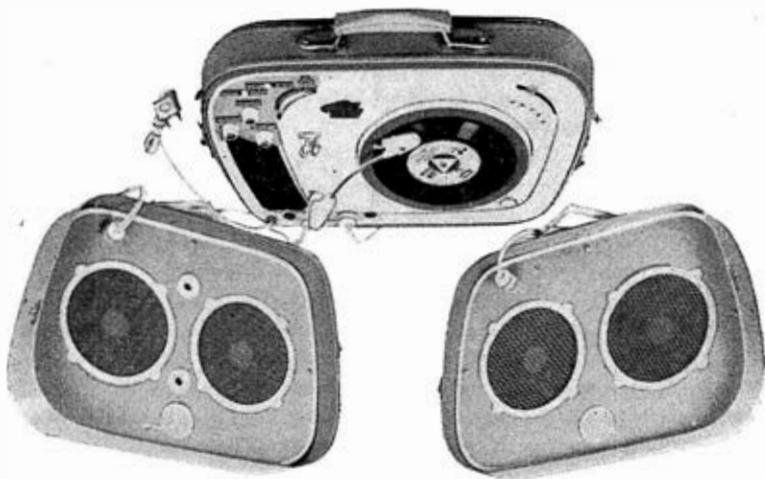
Balance control.

Power: 2 x 6 watts.

Double push-pull amplifier.

6 Tubes (2 EF 86 4 ECL 82).

2 silicium cells eliminating over-heating.



2 supplemental sockets for extra speakers on right and left.

Compact unit in a single case; the two baffles being top and bottom covers. Strongly designed.

High class finish—leather or blue parm.

Record



Players

ECO 60

4 speed turntable.
For good console units; hysteresis synchronous motor, 110/220 Volts. 50 c/s (60 c/s under request). Absolutely constant speed. ECO standard tone arm for 33/45 rpm and 78s. Differential automatic stop system.

ECO STEREO

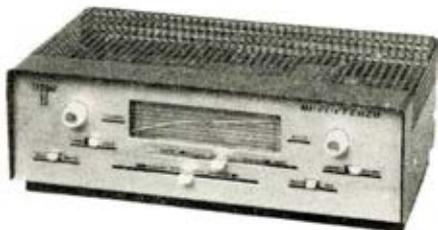
4 speed turntable. Automatic stop system. With HI-FI ECO STEREO tone-arm for high class amplifiers and consoles. Co-axial outlet for right channel.

ampli c336

Lineal controls.
Bass and treble controls with graphic lecture. 8 watts. 5 Tubes (2 EF 86 - 2 EL 84 - 1 EZ 80).
Input impedance. 5,000 K/ohms.
Output impedance: selector for 2.4-8-15 ohms.
Outlet for tweeter.
Conditioned chassis.
Golden panel.

ampli 45o

Lineal controls.
Bass and treble controls with graphic lecture.
Balance control of Stereo speakers. 2 x 6 watts. 6 Tubes.
2 Silicium cells eliminating over-heating.
Input impedance: selector for 2.4 8-15 ohms on each channel.
2 separate contour switches.
Elegant chassis, golden and black.
"Chic" and functional panel.



DUO DYNAMIC CABINET

High fidelity combination of 4 speakers.

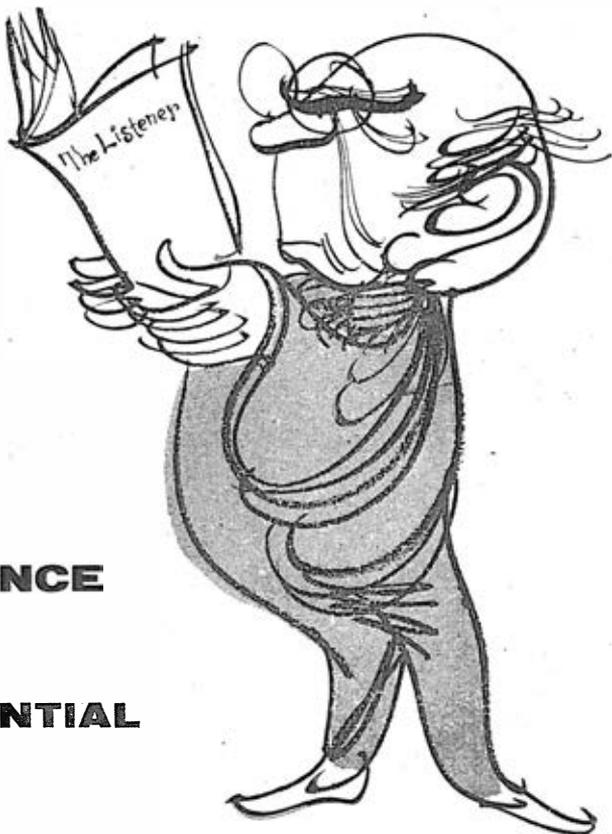
One 3D type + 3 tweeters. Strict wooden cabinet, nice looking.

Dark or light coloured.



TEPPAZ 170 Bd. de la Croix—Rousse, Lyons (1°)—
160 Rue la Fayette, Paris (4°), FRANCE

**YOU
INFLUENCE
THE
INFLUENTIAL
IN**



The Listener

and B.B.C. Television Review

Over 815,000 influential people read The Listener every week. They are the people throughout our society who are interested in the best things in life including the best of broadcasting, the finest reproduction and top quality instruments. That is why Hi-Fi advertisements are studied with close attention in The Listener, and why Hi-Fi advertisers find The Listener such value for money

The rate is £144 per page and pro rata.

If you would like to know more about The Listener, the people who read it, and qualitative advertising media in general, write to:

Advertisement Department, B.B.C. Publications, 35 Marylebone High Street, London, W.1.

The Story of Stereo

by PETER FORD, LL.B., F.R.S.A., M.R.I. Hon. Historian, B.S.R.A.

OUR ability to localise sounds by mental comparison of the sensations at each ear was investigated as long ago as 1876 by Lord Rayleigh, with some simple experiments on the lawns of his home at Terling Place, Witham. In the following year, Silvanus P. Thompson, of Bristol University, read a paper "on binaural audition" to the British Association at its Plymouth meeting. Both men returned to the subject again—Rayleigh three times—and paved the way for our modern studies of a highly complex matter.

A French telephone engineer, Clément Ader, was the pioneer of stereo sound transmission. In 1881 he arranged two-channel telephone links between the Paris Opéra and the Electrical Exhibition at the Palais de l'Industrie. Forty people could listen at once over earphones and his *téléphones théâtrales* were a wonder of the age, though soon forgotten.

In 1911, Augustus Rosenberg, a German, proposed to make motion pictures with separate synchronised left and right sound records to give auditory perspective corresponding to movement on the screen, but, like Ader, he was before his time.

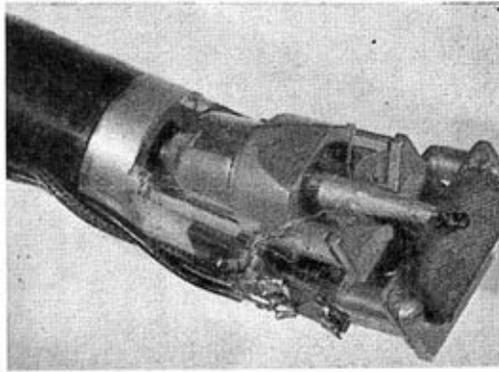
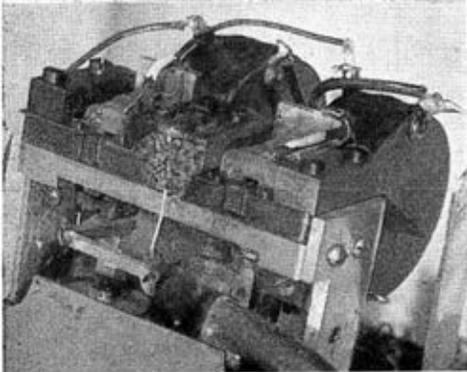
Ten years later, Professor Doolittle experimented with two-channel radio broadcasting at Yale University. His system was actually employed com-

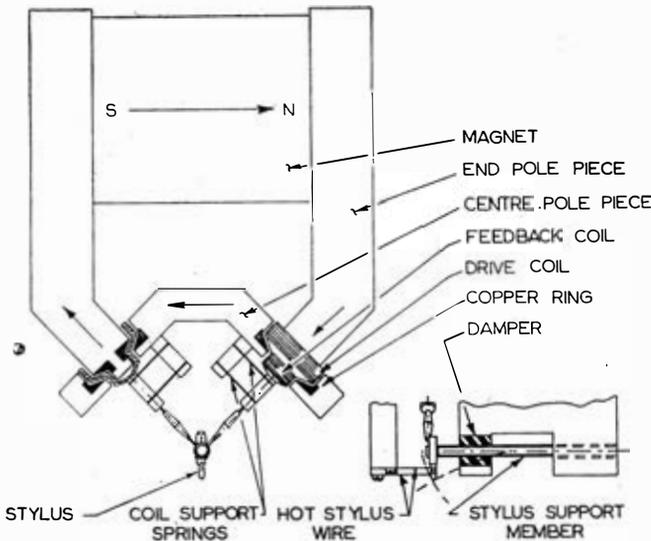
mercially for a short period in 1925 by the New Haven (Connecticut) radio station WPAJ. H. J. Küchenmeister carried out similar experiments in Germany, besides being early in the field with "pseudo-stereophony," which he effected by playing ordinary gramophone records on a machine fitted with two sound-boxes and horns, so arranged that the one reproduced the same sounds as the other after a time delay of about 0.05 to 0.1 second. By this means he purported to obtain a "spread" sound image.

In 1931, A. D. Blumlein of E.M.I., Ltd., laid the foundations of our modern domestic stereo listening with two spaced loudspeakers and contributed the idea of two sound tracks cut in a complex manner in a single

Left: **BLUMLEIN MAGNETIC RECORDER** for stereophonic complex cut vertical lateral gramophone records (c. 1932). Two identical balanced armature magnetic cutters mounted side by side, were connected by mechanical linkages to the cutting stylus (seen in the centre). (Photo: E.M.I.)

Right: **BLUMLEIN MAGNETIC PICKUP** for stereophonic gramophone records (c. 1932). Two magnetic systems were disposed with their principal axes of response at 45° to the vertical and at 90° to one another and were driven by a common armature free to move in all directions in the plane of vibration. The outputs were electrically summed and differenced to produce the required left and right channel signals. (Photo: E.M.I.)





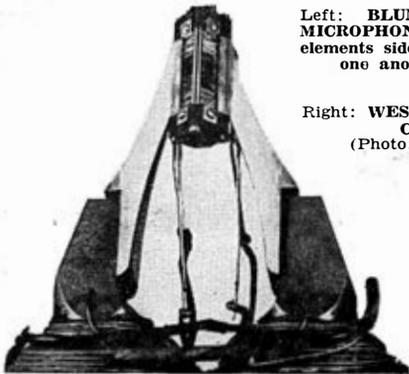
WESTREX 3A STEREO CUTTER (c. 1957) Schematic showing construction and driving systems. (Drawing: Westrex Co. Ltd.).

groove on a gramophone record. His work also extended to the cinema, and a wide-screen demonstration film with stereophonic sound was shown to the trade in 1935.

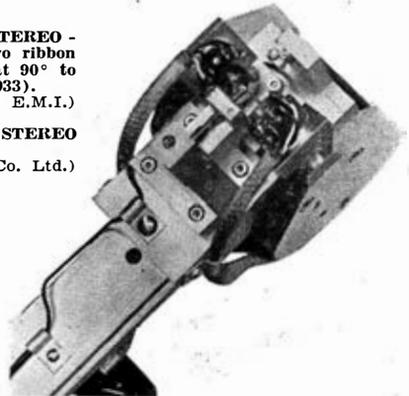
Blumlein believed in using two closely spaced or co-incident microphones to produce his left and right-hand sound signals, but another idea, satisfactory in large auditoria, was pioneered in the U.S.A. in 1933. Three microphones in line, with the two outer ones 28 ft. apart, were used to pick up the sound of the Philadelphia Orchestra playing in its home city, and their signals were transmitted over separate 150-mile land lines to Constitution Hall, Washington, where they were reproduced on three spaced loudspeakers. The system had an astonishing performance for its date: frequency

range 40-15,000 c/s \pm 1 dB; dynamic range 65 dB. The Bell Telephone Laboratories, which were responsible for this system, recorded two-channel stereo on disc in 1936, and on two steel tapes wound together on the same supply and take-up reels for demonstration at the New York World's Fair. In 1941 they also produced the "comandor" three-channel sound film system. In 1940, Walt Disney produced his "Fantasia", with a multi-channel, but not strictly stereophonic, sound track (never heard in Europe at the time).

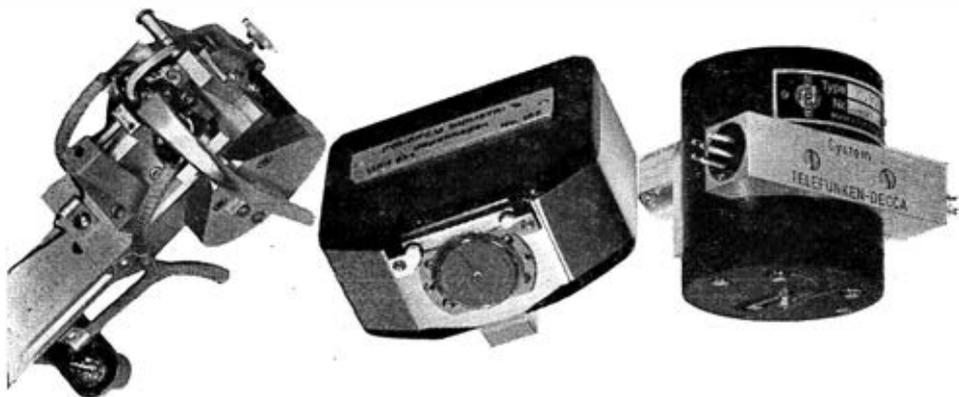
In 1939 de Boer experimented with two-channel stereo in Holland and in about 1944 the Nazi German radio RRG began making a library of two-channel stereophonic recordings of orchestral music on magnetic tape—using spaced half-track heads.



Left: **BLUMLEIN STEREO - MICROPHONE** with two ribbon elements side by side at 90° to one another (c. 1933). (Photo: E.M.I.)



Right: **WESTREX 3A STEREO CUTTER**. (Photo: Westrex Co. Ltd.)



THREE MODERN FEEDBACK MOVING COIL STEREO DISC CUTTING HEADS. Left: Westrex 3C. Centre: Ortofon. Right: Telefunken-Decca ZS 90/45. The Westrex model has an advance ball mechanism to control depth of cut automatically. (Photos: Westrex, Fonofilm and Neumann)

MODERN ELECTROSTATIC STEREO MICROPHONE for professional use, with two microphone capsules on a common axis. The upper capsule may be rotated through an arc of 270° by inserting a coin in the slit on the top of the microphone. The directional characteristics of the two capsules are remotely controlled electronically. (Photo: Neumann, Berlin)



TWO-CHANNEL TAPE REPRODUCER used in transferring tape recordings to disc. Three replay heads can be seen. That at the right takes the programme signals to the disc recorder. The other two provide signals controlling respectively the number of grooves per radial inch on the disc and the mean groove depth. (Photo: Fonofilm, Copenhagen)



After the war, W. H. Livy (1946) and A. C. Haddy (1954) experimented with stereophonic gramophone records using carrier modulation systems for the second channel and A. R. Sugden (1951) and J. T. Mullin (1952) returned to the ideas of Blumlein, which bore fruit in international agreements amongst record manufacturers in 1957. Two-channel stereo tape records—at first using staggered heads—were introduced to the American domestic market in 1951 and (using stacked heads) to that in Britain in 1955.

Sugden's stereo disc demonstrations at the May, 1956, B.S.R.A. Exhibition attracted wide attention on both sides of the Atlantic and were an undoubted stimulus to the record industry. Previous small-scale production of stereo records by E. Cook (U.S.A., 1952) suffered from the disadvantage of separate recordings of each channel on different bands on the disc, which halved the playing time and made accurate phasing of the signals from two pickups difficult. "Compatible" stereo records have also been proposed (P. Goldmark, U.S.A., 1957) and produced on a small scale.

RECORDING CONTROL ROOM with comprehensive facilities for mixing and recording stereophonic programme material.
(Photo: Decca)

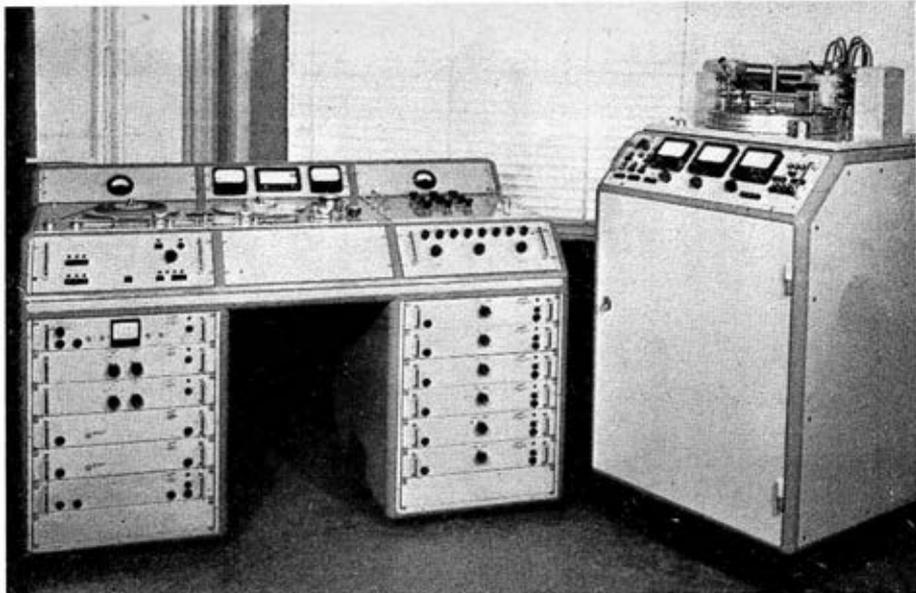
Experimental "pseudo - stereo" radio transmissions were made in France in 1950, and followed by two-channel transmissions in the U.S.A. from 1952, in France in 1955 and in Britain from 1958. Much effort is being directed to the development of radio transmission techniques, which will give the ordinary listener with a single channel receiver a satisfactory programme and thus be economical and "compatible." "Compatibility" is not as easy as it sounds as, apart from the complexities of transmission techniques, it is not always possible to produce a satisfactory single-channel sound by blending the outputs of two or more stereo microphones.

Motion picture engineers have generally followed the spaced microphone techniques devised by the Bell Telephone Laboratories, though much "faking" is resorted to. Seven-track (Cinerama), six-track (Todd-AO), four-track (CinemaScope) and three-track (3D) sound systems have been used since stereo invaded the cinema in and after 1952.

Some idea of the equipment currently used in the production of stereo records for the home can be obtained from the accompanying photographs.

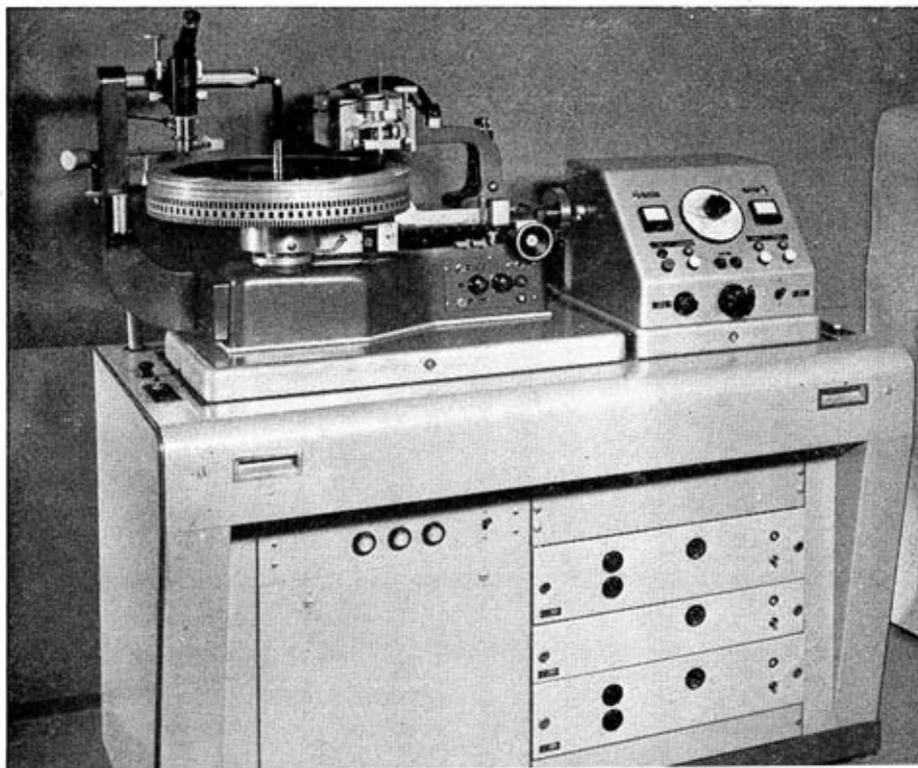
© Peter Ford, 1960





TAPE REPRODUCER AND DISC CUTTING LATHE for stereo recording with fully automatic control of all functions. Four cutting speeds: 78, 45, 33 $\frac{1}{2}$, 16 $\frac{2}{3}$ r.p.m. (Photo: Fonofilm, Copenhagen)

STEREO DISC CUTTING LATHE with automatic control. The pitch and depth of cut control units are at the right. One model permits cutting 45 and 33 $\frac{1}{2}$ r.p.m. discs at half-speed (22 $\frac{1}{2}$ and 16 $\frac{2}{3}$ r.p.m.) to give the best available sound quality with a given cutting head. (Photo: Neumann, Berlin)



you should read...

THE GRAMOPHONE



**BRIGHTEST, BEST AND MOST
UP - TO - DATE GRAMOPHONE
JOURNAL IN THE WORLD.**

- ★ Authoritative Record Reviews
- ★ Interesting and Informative Articles
- ★ Technical Reports
by PERCY WILSON and
JOHN GILBERT

1/6

Published on the 1st of the month



Average net sale figure July to December, 1959, was 70,633 copies.

MEMBER OF THE
AUDIT BUREAU
OF CIRCULATIONS

ORDER FORM

"The Gramophone", 49 Ebrington Road, Kenton, Harrow, Middlesex

I enclose my subscription for 24s. (or 26s. including index) for one year, post free. Subscription to the U.S.A. and Canada 4 Dollars, beginning

with number Date 196.....

MR., MRS., MISS

Address

Copies of "The Gramophone" are obtainable from Newsagents,
Railway Bookstalls and Record Dealers throughout the Country.

Converting to Stereo

by Ralph West

"**S**HOULD we convert to stereo? and if so, how?" must be exercising the minds of many people at the present time, especially many of the visitors to this 1960 Audio Fair in London. It is indeed a most perplexing time with many new words and expressions appearing in all the advertisements. Are "stereo" and "high fidelity" different words for the same thing? and have we only just discovered all our old 78 and LP gramophone records are "monos?"

It would take a long time to explain fully all these things, but we will try and give some help. We cannot choose equipment for the reader, any more than we would presume to choose the readers' clothes, but we will try to give some guidance to enable a wise choice to be made.

Improved Standards

Once upon a time, we used to make our own radio receivers, crystal sets at first, later valve operated ones. We had to do this as there was no radio manufacturing industry in existence. Everyone was an expert then! Gradually, commercially made receivers appeared and they were eventually made in such large quantities that they could be sold relatively cheaply. With the arrival of the electric pickup, this industry also became one with the gramophone industry and the two grew up together.

Technical standards have, on the whole, risen steadily and the modern

domestic radiogram is indeed a wonderful box of tricks, though we tend to take it for granted like our watches and motor cars.

There always have been, and, we hope, there always will be little groups of enthusiasts who want something better than the general run of things. Some wanted loudspeakers that didn't sound like loudspeakers, some wanted records with no surface noise, others wanted a pickup that would never wear a record out, and so on. A few of these things could be had right away — at a price of course, but most of them needed painstaking trial —and error—over a period of years. Their goal was perfection, but like the horizon it was always a little farther on — so they are still hard at work! Many of these efforts developed eventually into small specialist firms and that was the birth of "High Fidelity." They have led the way, and still do, but they have stimulated and benefited the whole audio and radio industry.

The very best "high fidelity"

apparatus can never be very cheap as it usually necessitates the use of somewhat more costly components. rather more care in manufacture and test, and, being made in smaller quantities it does not benefit from the cost reduction of large scale production. There is no definite dividing line any more than there is in the range between the Rolls-Royce and the Ford Popular, but, of course, merely labelling something "High Fidelity" does not improve it one bit! Generally speaking, we have to buy what we can afford, and even the cheapest model from a reputable firm is expected to do its job properly.

What Stereo Offers

Now stereo has come along and has upset all our standards. It has, however, spurred on to even greater efforts the whole audio industry, which responded magnificently and we are the better for it — after a period of trial and tribulation! What does stereo offer?

Well, man is born with a pair of ears which give him two valuable faculties as well as having a spare. The first faculty is the ability to detect the direction from whence comes a sound. This is probably not the most important one from the point of view of listening to music, etc. It was grossly over-emphasised (and exploited) and still is, in much of our approach to stereo, though it was fun listening to ping pong games and trains thundering through our drawing rooms! The most important faculty is the ability to hear clearly when more than one sound is being produced at the same time. This is the thing most noticed by a person going deaf in one ear, not the difficulty of direction.

"Cocktail Party Effect"

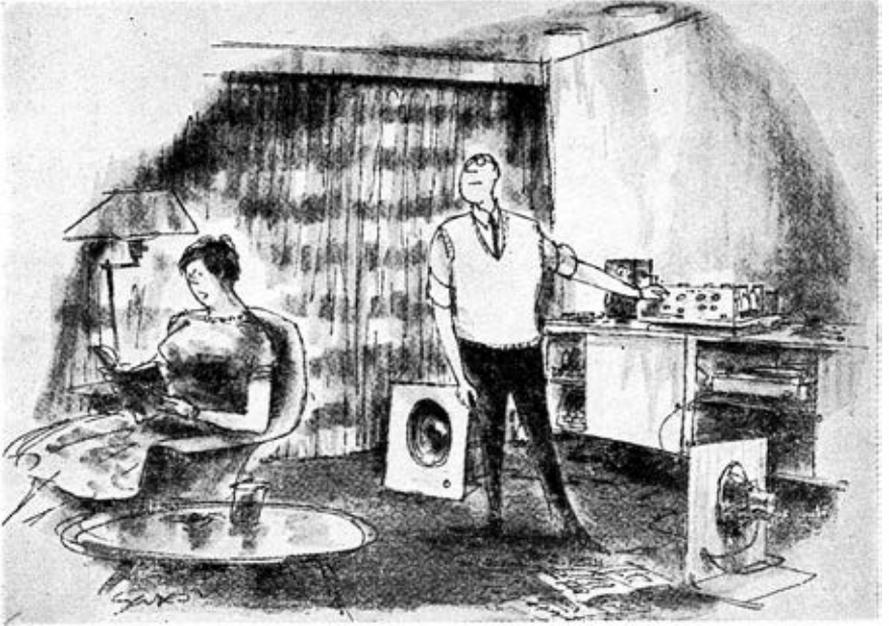
Amongst engineers it is known as the "cocktail party effect." We use both our ears, of course, listening to a single loudspeaker, but this single speaker cannot recreate at both our ears the subtle differences in sound that exist when we are listening to the real thing. It is like trying to enjoy an

orchestra when sitting in a soundproof box with one small hole in its wall — the loudspeaker. "High fidelity" has endeavoured to make this hole larger and less obstructed, a clearer view in fact. The cheapest stereo gives at least the effect of two small holes in the wall. While it is definitely an improvement on "one small hole," it will probably not be judged a good exchange for someone with really good mono equipment. A change to stereo may be very thrilling at first, but unless the quality of the equipment is comparable with the previous mono equipment, disappointment will eventually result.

It should also be pointed out that merely putting two, or even three, loudspeakers in one box, however tastefully styled, and labelling it stereo, does not guarantee the production of any stereo effect. There is more to it than that, as any audio firm of repute very well knows.

Converting in Stages

This, of course, means the change to stereo is not cheap, unless one is replacing relatively cheap equipment. It may well pay to do it in stages, especially if the existing apparatus is good and has given satisfaction. A first step could be a second speaker. It need not be an identical one, but it is often an advantage. Theoretically the two speakers should be identical, but as they are influenced by their surroundings — and these are seldom identical, the force of that argument is somewhat reduced. Run the two speakers from the one amplifier. The mismatch will not do any harm and does little more than restrict the full power output of the amplifier—which should never be used at home anyway! These "semi-stereo" results will be quite an improvement. Most people with stereo equipment find they prefer to leave both speakers in use even for mono signals. The advantages of stereo equipment then, are not confined merely to the playing of stereo discs and tapes. If the two speakers used thus give pleasant listening it is fairly safe to assume



Reproduced from "New Yorker"

"It doesn't sound very stereo to me"

they will be satisfactory when fed with the real thing later on.

The next step would probably be the second main amplifier. It certainly need not be identical with its partner, although it is generally more convenient. Any two good amplifiers will produce results that would be very difficult to distinguish between. Your local "high fi" or radio dealer or the equipment manufacturer will be able to give the necessary technical help and advice. Next would be the pre-amplifier changeover — to a stereo version. It is possible to use a second similar preamplifier but the multiplicity of controls will daunt all but the most enthusiastic. An alternative scheme is to purchase a so called "integrated (stereo) amplifier." That is merely a pair of amplifiers complete with all controls in one box. It is really an old arrangement, but miniaturisation and modern methods have produced compact and elegant designs with excellent quality and

more than enough output power for all domestic requirements. The pickup has been left as the final move, but it could also be the first move, especially where it is desired to start buying stereo discs right away. The two outputs from the stereo pickup can be fed into the single amplifier input. Some stereo pickups actually provide a separate mono output which could be used in this instance. One must not expect first class mono results from a stereo disc every time, as the two systems usually use very different microphone arrangements. The stereo pickup will, of course, play mono discs quite satisfactorily providing they are not too badly worn and the comparison is not between an expensive mono pickup and a cheap stereo pickup, needless to say! Never play stereo discs though with a mono pickup. The best stereo pickups of today are at least as good as the best mono pickups of a year ago, and this difference is likely to increase as more

development goes into the stereo pickup. Experience suggests that some of the better quality stereo pickups that are able to use a "half-thou" stylus, may well give old LP discs a new lease of life. Their grooves, of course, must never have been damaged by a worn or broken stylus.

Motor Noise and Rumble

A word about motors is not out of place here. As a stereo pickup is sensitive to vibration in more than one direction, it is liable to show up motor noise and rumble not previously noticed. Some of the cheaper pickups with a too-light head may emphasise it and, of course, a loud-speaker with a good bass response will show up more than say a small speaker in a cheap record player. Many amplifiers are fitted with rumble filters to deal with this eventuality, as we can't all afford the best motors and pickups.

Record Wear

With the highest present day standards, disc life seems to be almost indefinite, but with good average equipment a life of many hundreds of playing is likely provided two precautions are observed. First, the stylus tip is never allowed to wear appre-

ciably. This may be between hundreds and a few thousand sides for a diamond stylus, but only between 50 (at worst) to a few hundred for sapphire. Many dealers have provision for examination of stylus condition. If in doubt change it, a sapphire replacement stylus costs a lot less than one disc, yet could ruin hundreds of discs. Secondly, the discs and pickup should be handled with the care and intelligence they deserve.

Preserving Discs and Tapes

A pickup lowering device is a great help and fingers should *never* touch the grooves. The regular use of a good proprietary cleaning device is essential as it is impossible to keep dust from a disc all the time. Tape is a little easier to look after, but on the other hand damage is not so readily obvious. Again fingers ought never to touch the tape surface as sticky marks lead to wow and flutter. It must be stored in a cool place (and away from sunlight) or noise and print-through increase unduly. It must never be placed, even momentarily, close to ferrous objects, they are sure to be magnetised. The regular use of a head demagnetizer is a good habit as one pass by a magnetized head will seriously raise the noise level on the tape as well as partially wiping the very high notes. Most things last longer and give better service with that little extra care and attention. Stereo certainly needs that little extra effort and care in installing and handling. The dealer cannot give an adequate service until he has had personal experience with it, and the new stereo owner has to learn how to get the best from it. It takes time as none of us is born with the experience.

Well, should it be stereo? Yes, if you can afford it, yes if you realise it is not a substitute for high fidelity but a parallel development that takes high fidelity one step higher and lastly yes if you go to a reputable firm and don't try and do it the cheapest possible way.

Happy listening!



"This time keep off politics, religion and stereo"

with apologies to "Punch"

Britain's Best Hi-Fi Equipment . . .

LEAK Amplifiers are the choice of professional engineers such as the B.B.C. (over 500 delivered), the South African Broadcasting Corporation (600), ITV and many other Commonwealth and Overseas broadcasting and TV systems, who use them for transmitting and/or monitoring the broadcasts to which you listen. Also, many of the gramophone records to which you listen are cut via LEAK Amplifiers.

The "Point-One Stereo" pre-amplifier is designed so that it can be used with any Leak monaural power amplifier or a combination of any two Leak monaural power amplifiers additionally to its more normal use with the "Stereo 20" or "Stereo 50".

Extract from Test Report by J. C. G. Gilbert reprinted from the Music Trades Review. The full two-page Test Report and an illustrated brochure on the amplifiers will be sent you on request.

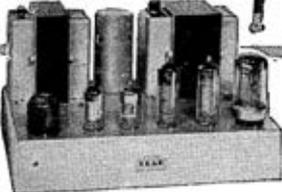
"The Point-One Stereo" pre-amplifier is probably the most comprehensive unit in existence covering every requirement for stereo tape, disc and radio plus monaural amplification for any form of input signal . . . it is difficult to think of any additional requirement that one would ever wish. The equipment performs with the high performance always associated with the traditions of Leak equipment. It is a fine example of design and construction, and the pre-amplifier can be used with any other Leak main amplifiers. How the pre-amplifier can be sold for as little as £21 can be answered only by Harold Leak . . . * Summing up, therefore, one can highly recommend the Leak stereo system for use with any current monaural or stereo input whether it be from pickup, tape, radio or microphone."

* The prices are made possible by our World-wide sales.

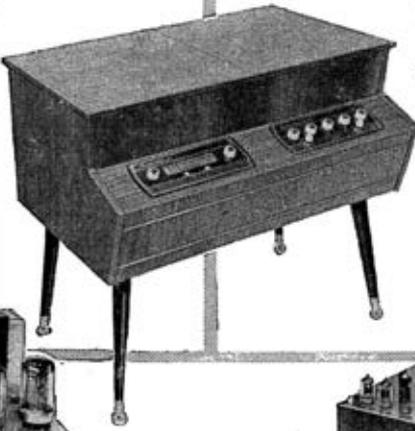
Monaural

- VARISLOPE III PRE-AMPLIFIER
- TL/12 PLUS POWER AMPLIFIER
- SOUTHDOWN CABINET

TOTAL £55 : 13s.



TL/12 Plus Amplifier 18 gns.



Point-One Stereo Pre-Amplifier £21



Stereo 20 Amplifier 29 gns.

Stereo

- POINT-ONE STEREO PRE-AMPLIFIER
- STEREO 20 POWER AMPLIFIER
- SOUTHDOWN CABINET

TOTAL £72 : 9s.

Ask your Dealer to show you Leak equipment.

LEAK

the first name in
High Fidelity
since 1934

H. J. LEAK & CO. LTD.
Brunel Rd., Westway Factory Estate, London, W.3
Telephone: SHEpherds Bush 11734/5.
Telegrams: Sinusoidal, Ealux, London.

Please send me Test Report
Brochure:

NAME

ADDRESS

LAFC



by Edward Greenfield

“OF course I’m a hi-fi enthusiast but anti-stereo”—that was the remark made to me recently by a highly intelligent record collector, and I am sure it is typical of thousands up and down the country who, having accustomed their ears to the added clarity of hi-fi reproduction now have serious doubts about what they suspect is just a new gimmick.

I would be the last to claim that stereo has achieved anything like perfection—the history of the gramophone shows how fallible our assessment of the reproduction in one generation proves a few years later—but I think it is highly important to emphasise that hi-fi and stereo are not contradictory things but complementary. Some hi-fi enthusiasts may feel at the moment that they prefer good mono reproduction to any existing stereo, but to proclaim oneself as “anti-stereo” strikes me as the height of absurdity.

Stereo I am quite convinced is just as important a development in the history of the gramophone as electrical recording and the L.P. disc, maybe even more so, and it is quite obvious from the big advances already made that the hi-fi enthusiast is going to be as big a gainer from stereo as his less discriminating fellows.

I, myself, hi-fi enthusiast that I am, was at first highly sceptical of the benefits that stereo would bring,

but it took very little time indeed after the stereo equipment was installed in my home for me to be completely won over. The first important point I think is that the acoustics of one’s own room—often making or marring the sound obtainable from a particular disc on particular equipment—becomes less important since stereo re-creates more vividly than any mono reproduction can, the acoustics of the recording studio. In other words, there is an added immediacy about the sound, and it is more spacious.

Generally, though this does, of course, depend on the equipment used, a stereo reproduction is warmer and richer and remarkably less tiring on the ears. This last quality, I think, owes much to the feeling one has in listening to stereo that the speakers have disappeared. It would be interesting to hear a technician’s analysis, but I have a shrewd idea that in stereo reproduction the distortions in the reproduction from one loudspeaker tend to be

cancelled out by the reproduction from the other and vice versa.

Then any hi-fi enthusiast must immediately be struck when listening to stereo by the separation of the sound. It is not just a question of the sound of the first violins coming from one direction and the double basses from another, but that one can distinguish and follow the separate parts so much more comfortably. Not long ago an experiment was conducted in which two separate conversations taking place a few yards apart were recorded both monaurally and stereophonically. It was found that while the mono recording produced a jumble of sound with neither conversation completely intelligible, one could in stereo follow either conversation at will just as one could in real life.

This might suggest that stereo carries one stage further the effect of hygienic, almost disembodied, clarity that marks some hi-fi mono reproduction. Nothing could be further from the truth. It is stereo's great merit that the sound, being so vivid and real, tends to co-ordinate into a pleasing and balanced whole more readily. It is this feeling of co-ordination which adds so much to the sense of realism and atmosphere of stereo.

Often one finds that a musician

tends to prefer medium-fi stereo to hi-fi mono, and I rather feel that the reason is the importance a musician places on the relationship between the instruments and the sum total effect, rather than the individual exactness of each strand in the web.

I feel that too many hi-fi technicians—including some of the recording engineers—have placed too much emphasis on the brilliant knife-edged clarity of recordings. I have sometimes called it the "Festival Hall effect," in which every line from top to bottom of the score is clearly separated and reproduced with every known harmonic ringing out like mad above. This is "separation" of a kind in which even the best stereo at the moment finds it hard to compete, but how much more truly separated to my ears at least are the sounds from a good stereo disc.

In opera, for example, it is not just that the singers can be made to move around on the stage and to give the impression of acting their parts before the microphone (sometimes a dubious advantage), but that the singers and orchestra do not sound as though they were breathing down one another's necks just the other side of the loudspeaker.

But there is no point in being dogmatic about any effect of recorded



"Look! Stereo!"

Reproduced from "New Yorker"

reproduction. It is not just that the same record can sound quite different on different equipment or that the same equipment can sound very different in different rooms, but that ears vary an enormous amount in the way they hear sounds.

In the first place, as a man grows older his ears hear far less, and the ceiling for audible harmonics will come down from, say, 20 kc to a mere 8 kc. The late Professor Edward Dent used to say in his old age that everything had come to seem a semitone flat—there the man with absolute pitch talking—and I am sure that had something to do with the absence to his ears of harmonics that he had once perceived clearly. But even granted two listeners with equal powers for hearing the full harmonic range you will find that what their brains make of the messages from their ears is often astonishingly different.

I fortunately have a number of friends who are just as analytical about the sounds reaching them as I am. Frequently I find that where a particular friend hears a woman's voice as rich and full, I will hear a pronounced wobble and occasionally vice versa.

The important thing is to know something about the peculiarities of

one's own ears and through acute listening to learn to trust them. If any music-lover does not like the sound presented to him by any equipment, whether mono or stereo—and I have had my ears almost sliced off by some demonstrations—let him say so.

It is the advantage of having equipment put together by a dealer that the permutations and combinations of components are almost limitless. Hi-fi dealers usually have long experience of dealing with exacting customers, and it is up to each music-lover—his duty even—to use his own discernment and rely on it.

With stereo there are various special problems. One finds, for example, that motor rumble can be even more infuriating than in a mono set-up. But generally the same problems apply with stereo as with mono, and it is important to remember that stereo is essentially a domestic medium.

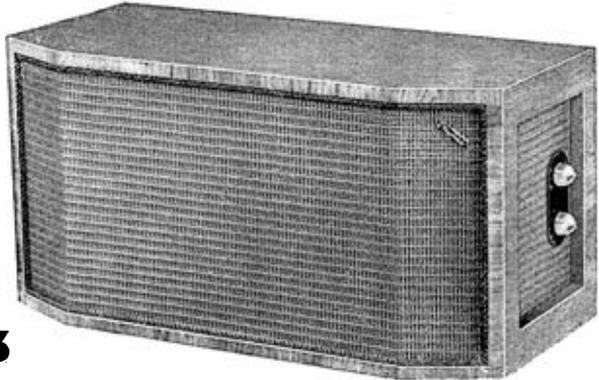
It is vital to hear how it will sound in a room the size of one's own living-room, and incidentally, not to dismiss stereo out of hand just because a mass demonstration fails to have its effect. There is no doubt in my mind that stereo represents the clear way forward in hi-fi, and that already the best stereo is far in advance of the best mono.



"If only that energy could be harnessed and put to useful purpose"

with acknowledgments to "Punch"

A COMPACT SPEAKER SYSTEM WITH CLEAN BASS



Model W3

The W3 is a three-speaker system in which compactness has been achieved without sacrificing quality of reproduction and without introducing "small box" tonal character. It is ideal for use on stereo or single channel input where room space is limited, as the cabinet may be stood vertically on the floor or placed horizontally on a table or shelf. The sensitivity is high enough to give full domestic volume with any good commercial FM receiver with about 3 watts output.

BASS

L.F. output is produced by a special 12" unit type WLS/12 fitted with a heavy cone and a new type of suspension which permits large linear excursions and gives a low fundamental resonance of 25-30 c/s.

TREBLE

The upper registers are handled by 5" and 3" units connected in parallel via a quarter section 1 kc/s dividing network, with an extra series capacitor to protect the smaller speaker. Two volume controls permit adjustment of midrange and treble to give tone control and facilitate balancing different speakers on stereo.

Cabinet size 28" × 14" × 12".

Weight 48 lb. complete. Impedance 15 ohms.

Max. input 15 watts.

Effective frequency range 30/2000 c/s.

Price **£39.10.0** complete, tax free.

The elegant cabinet is available in a choice of walnut, oak or mahogany veneers. Also available in whitewood, price £36.10.0. Tropical model made with resin bonded plywood can be supplied at £2.0.0 extra.

Wharfedale
WIRELESS WORKS LTD
IDLE BRADFORD YORKS

Catalogue giving full technical details, response curves and oscillograms of the above model, available on request.

Telephone: Idle 1235/6

Telegrams: 'Wharfedale' Idle, Bradford

Get it TAPED

— to perfection

STANDARD				LONG PLAY				DOUBLE PLAY			
SIZES	FEET	REELS (1/2")	PRICE (£ S D)	FEET	REELS (1/2")	PRICE (£ S D)	SIZES	FEET	REELS (1/2")	PRICE (£ S D)	
3"	150	8ms	5 6	225	12ms	8 6	3"	300	16ms	10 6	
4"	300	16"	10 0	450	25"	14 6	5"	1200	1in 4"	2 5 0	
5"	600	32"	1 0 0	850	45 1/2"	1 8 0	6"	1700	1-30"	2 17 4	
5 1/2"	850	45 1/2"	1 7 6	1200	1in 4ms	1 15 0	7"	2400	2- 8"	4 0 0	
7"	1200	1in 4ms	1 15 0	1800	1.36"	2 10 0	SUPERGRADE				
8 1/2"	1750	1-33"	2 10 0	2400	2- 8"	3 10 0	7"	1200	1in 4ms	2 18 6	

— naturally



A MEMBER OF THE
BICC
GROUP OF COMPANIES



on

BOOTH No. 10

DEMONSTRATION ROOM No. 359

MSS Mastertape

MSS RECORDING COMPANY LIMITED, COLNBROOK, BUCKS TEL. COLNBROOK 2431
MSS SHOWROOM AND STUDIO: 21 BLOOMSBURY STREET, LONDON W.1

The Tape Recorder

BOOM

is on!

by

Peter Earl



WHEN the 1950's were still in their infancy, the only people who knew anything about tape recorders and tape recording, were a handful of experts, development engineers and back-room boys who were perhaps convinced that what they had up their sleeve might interest a certain small section of the great British public. Ten years later we can assess just how great has been the impact of the tape recorder on the British way of life. For one thing, they have sold not just by the tens of thousands but in hundreds of thousands and today there are over forty firms engaged in their production.

The incredible thing is that the industry, once established was not merely content to rest on its laurels but embarked on a programme of research and development that makes the early tape recorders seem almost like museum pieces in terms of performance and capability, though some diehards still believe the early models to be the best.

The tape recorder has taken its place in the home with the television set, washing machine and refrigerator as an indispensable part of daily life. One of the reasons for this boom has been the fact that the British family man is now used to

paying for things on hire purchase. that what once might have been considered luxury goods have been brought within the financial scope of every average family. Already more tape recorders are sold in this country per head of population than anywhere else in the world and it isn't hard to find the reason why. A look round this Audio Fair will show a wide variety of first-class machines retailing at reasonable prices that genuinely do suit every pocket and which open the door to a lifetime of home entertainment.

By the mere flick of a switch, radio programmes are yours to

record and keep for always. If you are a sports fan you can soon build up an enviable collection of commentaries on the big events of the year. A music lover will find a library of the world's classics at his disposal for the mere cost of a reel of tape that gives many hours recording time and can be used over and over again—up to 30,000 times if necessary. Tape recording today has become a hobby that all the family can join in and enjoy. Family "snapshots in sound" can be built up over the years — baby's first attempt at speech, reciting a favourite poem on the 6th birthday, an engagement party, silver wedding celebrations—the list is literally endless. But there is far more to it than that. A business man can use his tape recorder in the office for dictation, rehearsing an important speech or recording a conference or Board meeting, and then pick up his machine rather like a well filled briefcase and carry it home to continue his work or to entertain his family and friends. Amateur cine enthusiasts create their own sound tracks and others link their slide shows with a running commentary complete with sound effects and music—all on tape. One doctor has even used his tape recorder to record the heart beats of patients suffering from various heart conditions, and also the way they respond to treatment. This tape is used to instruct students and can easily be sent anywhere in the world.

It is impossible to estimate the number of people who now do most of their correspondence regularly throughout the world on tape. A friend of mine in South Africa is regularly entertained by the familiar sounds and voices from his home town which I have recorded on a battery operated tape recorder weighing only a few pounds. One enterprising farmer in the Home Counties uses a tape recorder to scare the birds away from his crops, although it might be rash of me to mention the name of the pop singer that has the most and speediest effect! People

are now talking about hypnotism on tape and experiments are being conducted by various hypnotists to teach people to pass the driving test, to lose weight or to give up smoking.

These, of course, are extreme uses but the whole joy about owning a tape recorder is the versatility it places at your disposal. Practically the only limits imposed are those by your own imagination.

When tape recorders began to trickle on to the domestic market, those who were in the know thought that the obvious customers would be actors and musicians who wanted to hear their own voices or their own performances. In fact the stage and concert hall provided merely the spearhead of an army that grew daily and the old conception of using a tape recorder to trap Auntie Nellie's voice unawares when she got a bit tiddy at the party, providing amusement for the others and consternation for her, has now flown out of the window.

When I sat down to prepare this article, I thought I would make a list of some of the individual uses of tape recorders. The list got out of hand very quickly so I scrapped it and started it again listing, for instance, the uses that the Church, architects, doctors, etc., might have and I gave up when it ran into hundreds.

If you have come to the 1960 Audio Fair with the object of looking around and choosing a tape recorder, then almost certainly this word of warning will apply. You may have in mind a very definite purpose and think that that is the only reason for buying your tape recorder but once you have it—use it and experiment, it will get a hold on you, and you will be gaily trotting off down a hundred and one avenues of sound. If you already own a tape recorder you will probably be amazed at my restraint in listing so few of the practical and utterly delightful applications that it offers.



TRANSISTOR AUDIO POWER AMPLIFIERS

Rank Cintel Ltd have pleasure in announcing the first demonstration of their new range of TRANSISTOR POWER AMPLIFIERS and PRE-AMPLIFIERS in Room 252.

•

These amplifiers will be used in conjunction with Ampex professional tape recording equipment during a demonstration of single channel monophonic and 2 and 3-channel stereophonic recordings.

•

The amplifiers can be inspected on Booth No. 27 and full technical data will be available.

RANK CINTEL LIMITED
Worsley Bridge Rd., London SE26
Hither Green 4600



Ampex domestic and

MUSIC SOUNDS BEST ON TAPE

In room 314 **you** can hear for the first time in this country just part of the range of Ampex Domestic Tape Recording Equipment featuring



4 TRACK 7 $\frac{1}{2}$ i.p.s. STEREO TAPES

These tapes are but a minute selection from the vast range of recordings now available on



UNITED STEREO TAPES

(A division of Ampex Inc.)

which feature the world's greatest artists.

•

MUSIC SOUNDS BEST ON TAPE

AND AMPEX DOMESTIC AUDIO
EQUIPMENT GIVES THE
FINEST REPRODUCTION OF TAPE



AMPEX INTERNATIONAL S.A.

Fribourg 1, Switzerland

3 - CHANNEL STEREO

In room 252 Rank Cintel Ltd are presenting another fabulous demonstration of three-channel stereo featuring Ampex professional tape recording equipment.

Not only can you hear the world's finest recorded sound but also how the two-channel stereo and single channel masters are made from the 3-channel original.

Continuous demonstrations three times an hour on the hour are being given throughout the period of the fair. Hundreds were disappointed at Harrogate, so make sure you don't miss the only London demonstration this year.

Programme presented by the U.K. distributors of Ampex video and professional audio tape recording equipment.



RANK CINTEL LIMITED
Worsley Bridge Rd., London SE26
HITher Green 4600

SEE
THE
FILM
THAT
BEAT
THEM
ALL

in Room 115

'The Magic Tape'

a **BASF** presentation

- 1st prize at 1959 Berlin International Festival of Industrial Documentary Films
- 3 special awards — Best Production — Best Camerawork — Best Commentary
- Also awarded an 'Oscar' at 1959 Rouen International Festival of Industrial Documentary Films

1st among more than 80 films entered, 'The Magic Tape' highlights in 30 minutes of fascinating colour and action what can be achieved with magnetic recording tape. It provides the perfect background to the 'Authentic Sound' story of BASF tape — so excitingly told in many other ways on STAND No. 2.



the tape that beats them all
for **Authentic Sound**

F. A. Hughes & Co. Ltd 4 Stanhope Gate London W1



SHURE

the world's standard wherever

sound quality
is paramount

The prime purpose in the design of every Shure product is faithful sound reproduction. All are painstakingly designed, developed, manufactured and tested for flawless performance coupled with longest possible trouble-free service. Regardless of price, they will perform according to specifications and will operate for years without deviation from their original standards.

MICROPHONES



UNIDYNE

The world's most famous uni-directional dynamic microphone. Just one of Shure's many superb microphones.

HIGH FIDELITY STEREO



STEREO DYNETIC PICK-UP CARTRIDGES AND "INTEGRATED" ARMS
Overwhelming choice of critics, experts, music lovers for honesty and accuracy of sound combined with exceptional record protection.

MAGNETIC RECORDING HEADS · REPLACEMENT PICK-UP CARTRIDGES · SOUND LEVEL MICROPHONES

SHURE BROTHERS, INC. • 222 HARTREY AVENUE • EVANSTON, ILL., U.S.A.

U.K. REPRESENTATIVE: J. W. MAUNDER, 95 HAYES LANE, BECKENHAM, KENT

TRANSATLANTIC TRENDS

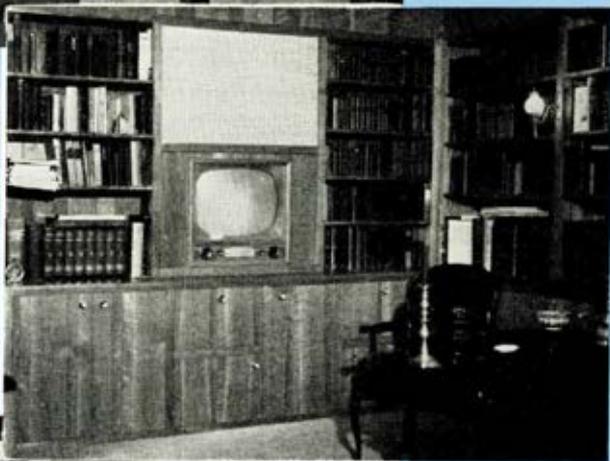


INDOORS

AND

OUT —

A monophonic installation easily convertible to stereo. The loudspeaker is concealed behind the grille cloth above the television Tuner, transcription motor and arm and preamplifier . .



. . . are readily accessible. Extension loudspeakers are provided in the garden-room
(AUDIO EXCHANGE)

TRANSATLANTIC

Some examples of high fidelity installations possible when space and income are not at a premium.



Simply Beautiful.



THE WHOLE WORKS — Built-in installation comprising remote-controlled television, stereo control unit with separate amplifiers, A.M./F.M. tuners, stereo tape deck and pre-amplifiers, multi-channel loudspeaker system and two changers — one for father's favourite records and the other for the children! (AUDIO EXCHANGE).

TRENDS

By kind permission of HIGH FIDELITY.



Stereo reproducers with F.M. and A.M. Tuners, record changer, television, and (below) tape recorder (SERGENT-RAYMENT).



SOUND UNDER THE STAIRS — *In this installation the speakers are mounted at each end and the adjustable doors reflect the sound into the room. The television chassis is rotatable, stereo radio, tape and record reproduction is provided (H. H. SCOTT).*

QUAD II POWER AMPLIFIER

POWER OUTPUT

15 watts throughout the range 20-20,000 c/s

INPUT

Sensitivity: 1.4V.rms for 15 watts output.
Load imposed on input: 1.5 M Ω in parallel
with 10 pF.

FREQUENCY RESPONSE

Within 0.2 dB 20-20,000 c/s.
Within 0.5 dB 10-50,000 c/s.

DISTORTION

(measured at 12 watts output).
Total third and higher order: less than 0.1%
at 700 c/s.
Higher order alone: less than 0.03% at
700 c/s.

BACKGROUND

80 dB referred to 15 watts.



PRICE £22.10.0

OUTPUT IMPEDANCE 15 Ω and 7 Ω

Effective output resistance: 1 Ω for 15 Ω
output.

POWER SUPPLIES

Input: 200-250v AC single phase (or 95-125v
AC) 40-80 c/s.
90 watts consumption (excl. control unit,
tuners, etc.)

QUAD 22 CONTROL UNIT

FREQUENCY RESPONSE

Radio and Tape inputs: 20-20,000 c/s \pm 0.5 dB.
Gramophone: Maintained over 20-20,000 c/s
within \pm 1 dB of the selected characteristic.

INPUT SENSITIVITY (at 1 Kc/s for 1.4 Vrms output)

Radio: 70 mVrms. Load impedance 100,000
ohms.

Tape: 70 mVrms. Load impedance 100,000
ohms.

Microphone: 1.5 mVrms. Load impedance
100,000 ohms.

Pickup: Depending upon adaptor unit.

DISTORTION (1.4 Vrms output)

All controls level: Any input 0.02%

NOISE

Total hum and noise: Better than—70 dB.

Noise:—80 dB or where applicable, the equivalent
noise of the pickup load impedance at
the input.



PRICE £25.0.0

Additional Adaptor Units each 15s.

OUTPUT

Control unit to power amplifier: 1.4 Vrms.
Tape outputs: Peak signal approx. 0.25 Vrms.
Maximum loading 500,000 ohms and 200 pF.

INTERCHANNEL SPECIFICATION

Cross talk: Better than 40 dB 20-20,000 c/s.
Balance control: Provides up to 9 dB un-
balance either way.

QUAD FM TUNER

TUNING RANGE

87.5-108 Mc/s.

SENSITIVITY

3 μ V for 20 dB quieting.

OUTPUT

100 mV at 100,000 ohms impedance (to be
terminated by 100,000 ohms across amplifier
input).



PRICE £21.0.0

Plus £7.17.6 P.Tax

CONSUMPTION

6.3 v 1.85 A: 330 v 27 mA.

QUAD ELECTROSTATIC LOUDSPEAKER

MAXIMUM OUTPUT

6ft. on axis in free space 93 dB referred to .0002 dynes/cm² in frequency range 50 c/s-10 Kc/s.
100 dB referred to .0002 dynes/cm² in range 70 c/s-7 Kc/s.
Total integrated radiation equivalent to 95 phons in enclosures up to 5,000 cubic feet with average reverberation.

BANDWIDTH

45 c/s-18 Kc/s. Rate of attenuation asymptotic to 18 dB/8ve.

DISPERSION

Approximately 70° Horizontal, 15° Vertical.

IMPEDANCE

30-15 ohms in range 40 c/s-8 Kc/s falling above 8 Kc/s (see booklet for power amplifier requirements).

AC POWER CONSUMPTION

Negligible.



PRICE £52.0.0

(All prices applicable to United Kingdom only)

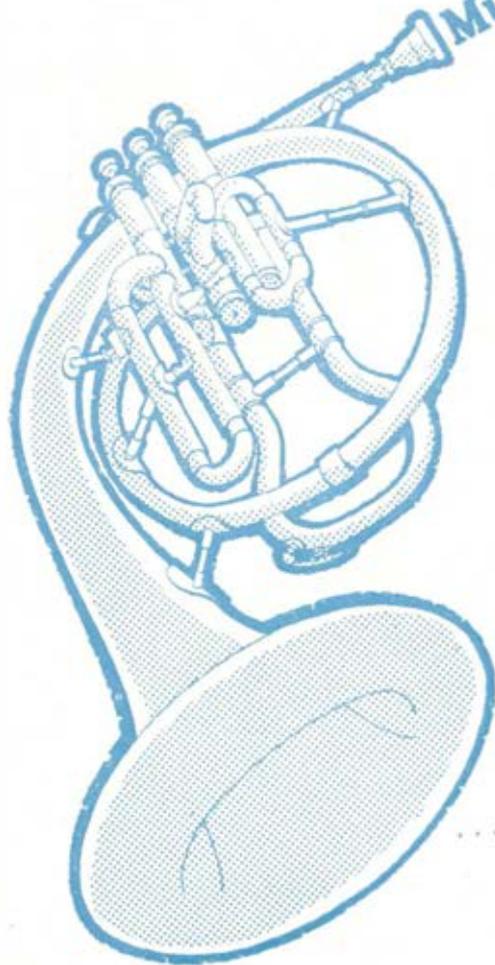
QUAD

*For the closest approach to the
original sound*

BOOTH 63
DEMONSTRATION ROOM
Nº 149

ACOUSTICAL MANUFACTURING COMPANY LIMITED
HUNTINGDON • HUNTS Huntingdon 361 & 574

Mullard AUDIO VALVES



... MADE FOR MUSIC!

STAND NO 47



MULLARD LIMITED
MULLARD HOUSE
TORRINGTON PLACE
LONDON W.C.1.

MVE216

Selecting a Tape Recorder

By JAMES MOIR, M.I.E.E.

MMUSICAL sounds are stored on tape as magnetic patterns in a thin surface layer of iron oxide rather than as side-to-side excursions of a spiral groove as in the familiar gramophone record. The technical advantages of storing sounds in this way are considerable, but they may be summed up in the simple phrase, greater fidelity of reproduction.

The advantages are so great that in the professional field, tape has completely superseded discs for all original recordings. This is true even in the gramophone recording studios where it may reasonably be assumed that the disc was not abandoned without good reason.

Tape has been less widely accepted for domestic use, though the reasons for this neglect are not very clear. In convenience of handling, it is in some ways inferior to the old-fashioned gramophone record which everybody understands (or thinks they do) but there are other factors, first cost, difficulty in selecting a required passage, an assumed liability to damage, and the restricted repertoire that is available; all minor items but probably sufficient to bias the possible user against tape. Most, if not all, these problems will disappear with the introduction of tape in cassette holders for these are as simple to handle as the traditional record, though they may find it difficult to compete on a first cost basis.

What should one look for in selecting a tape recorder for domestic use? There are few machines at any price that include a loudspeaker capable of doing justice to the rest of the machine for there is insufficient room in a portable machine to provide adequate baffle area. The designers appreciate the limitation and practically all machines have provision for connecting an extension speaker. If you are an enthusiast for high quality sound and do not possess a good loudspeaker, do not expect to find one in a tape recorder but bear the

absence in mind when planning your spending. If you have a good speaker system, check that the tape recorder output matches the impedance of your system or that you can obtain a suitable matching transformer.

Tape speeds are something of a problem. There are four standard tape speeds, 15in., 7½in., 3½in. and 1½in./second and most machines include provision for recording and replaying at two of these speed, some include three speeds. Fifteen inches/second is of no great value to the non-professional user though it is the standard for studio use because of the outstanding performance that can be secured. Results that are adequate in every way for the non-professional user can be obtained from tape running at 7.5in./second, the speed that is standardised for all commercially recorded tapes. For this reason facilities for running at 7.5in./second should be considered as mandatory when choosing a machine. Results obtained from the two lower speeds are acceptable for recordings where the sound quality is not of first importance. The bottom speed is, in fact, only suitable for speech, but it allows an uninterrupted playing time of several hours.

Comparisons of performance based on claims for frequency response obtainable are misleading, for there is little doubt that the frequency range that can be obtained at 3½in./second (in the best machines) will do more than justice to the majority of the material that is available to the amateur owner of a tape recorder.

The performance at 3½in. and 1½in./

second is limited more by the speed instabilities technically known as "wow and flutter" than by any restrictions of frequency range. These "wows" introduce a most annoying form of vibrato into everything that is reproduced. The amount of wow and flutter is expressed in per cent., most manufacturers quoting a figure for "total flutter" in their performance specifications. A figure of .1 per cent. is very good, .15 per cent. very acceptable and .2 per cent. tolerable. Few dealers have the equipment that will allow them to check this aspect of the performance but check the performance on a recording of a soprano singer or a solo trumpet. Excessive "wow and flutter" makes the sound very cracked and unpleasant.

Pushbutton control of all the functions is convenient and is undoubtedly preferred by the majority of users.

Most domestic machines make provision for 7in. diameter spools, but there are a few that will not accommodate a spool larger than 5in. Select a machine that will accept the larger spool unless your choice has many other advantages, for most of the commercially recorded tapes require a 7in. spool and these tapes are such a valuable source of entertainment that they cannot be neglected.

Practically all the machines on the market have a rated power output in the region of 3—4 watts, though there are a few with higher outputs. Three watts is marginally satisfactory for the average sixteen by twelve room even when a good external speaker is used, but it is completely unsatisfactory in such a room when the small speaker fitted to the machine is all that is available for replay.

All the tapes now available have two recorded tracks and all machines now have facilities for playing either track, but four track tapes and machines suitable for their replay are just beginning to appear. The provision of four tracks doubles the playing time per tape at the sacrifice of a few dB. in signal/noise ratio. It is too early to forecast the extent of public acceptance of these tapes but I suspect that the advantage of longer

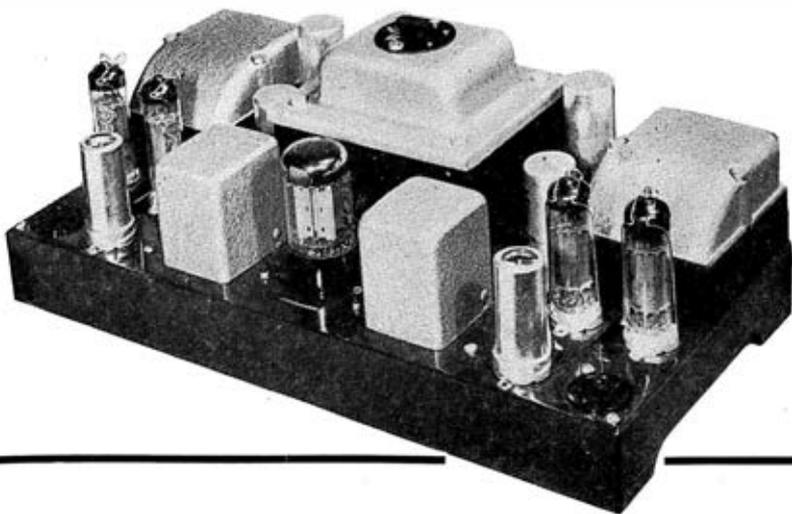
playing time or, viewed in another light, the reduction in cost per recording will ensure their approval. The new four track machines will replay the existing commercially recorded two track tapes though as the full track width is not scanned the signal/noise ratio falls slightly. It has been noted that all current machines can replay two track tapes but there is a difference in the ease with which the second track can be replayed. The majority of machines require the two spools to be lifted off the machines and reversed; not a very difficult job, but one that the less expert user obviously finds a bit of a nuisance. A few machines provide facilities for replaying either of the two tracks without spool reversal, a facility that is invaluable.

Now the problem of stereo. If you are a convert to stereo then you may wish to be able to replay some of the very excellent stereo tapes now available. Technically their performance is superior to that obtained from the stereo disc, though the price is higher. There are a few machines on the market that are fitted with twin track heads and the other facilities necessary to replay stereo tapes. The same machines also replay the standard tapes and though the stereo facilities cost a little extra they are well worth while when the emphasis is on sound quality.

Weight is important if you wish to carry the machine around with you. Forty pounds is perhaps a minor problem when the car is a few hundred yards away but above fifty pounds a machine becomes inconveniently transportable rather than portable.

Finally, a word of warning. It is quite impossible to select a tape recorder on the basis of the published performance specification. Narrow your choice down to perhaps two or three machines and have them home for the week-end, preferably with the speaker you intend to use. A comparison in your home is much more illuminating than the most complete technical specification. A good pair of ears is still the best judge of sound quality.

THE NEW RD JUNIOR STEREO AMPLIFIER



The one amplifier with every worthwhile feature — yet costing only £28.10.0 !

ESSENTIALLY a stereo version of the extremely successful RD JUNIOR Monaural Amplifier, this new amplifier retains all the features of the original design, plus a number of valuable detail improvements.

Push-pull Mullard EL84 valves, used in the firmly established "Ultra-Linear" circuit, provide a nominal output of 12 watts per channel—peak figure 15 watts—a rating more than adequate for all normal home use. The total harmonic distortion at 12 watts output is .2%.

High-grade multi-section Output Transformers feature grain orientated laminations and simplified speaker matching—three alternative impedances being available.

Particularly generous smoothing includes a dual filter ensuring extremely low hum level. Exceptional Power/Frequency Response characteristics have been achieved, power output being well maintained at both ends of the audio scale.

Additional features include, ample spare power for radio units, etc., dual A.C. outlets, phase reversal slide-switch, etc., etc.

Top quality materials allied to unusually high standard of workmanship ensure maximum long term reliability—a factor reflected in the TWO YEAR Guarantee covering every ROGERS unit made.

See and Hear this and other additions to the ROGERS Range

ROGERS

Stand No. 20 — Demonstration Room 213

Illustrated Literature free on request :—

ROGERS DEVELOPMENTS (ELECTRONICS) LTD

RODEVCO WORKS :: 4-14, BARMESTON ROAD :: CATFORD :: LONDON, S.E.6

The Sign of Good Tape!



Wherever you see this poster you can be sure to buy Emitape—the World's finest recording tape, preferred by professionals and amateurs alike.

Emitape

...and remember—
the **B.B.C.** use Emitape
9 times out of **10!**

“44” Popular (Acetate)

“88” General Purpose

“99” Long Play, giving
50% increased
playing time

“100” Double Play

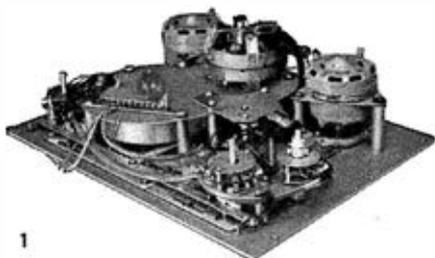
EMI SALES & SERVICE LTD (Recording Materials Division)
HAYES · MIDDLESEX · Telephone: **SOUthall 2468**

ES/R/80

The famous *Brenell* range

— each model with exceptional features

Versatility — realism — precision engineering at its best. Tape recording equipment made by Brenell is the outcome of nearly 10 years' research and manufacturing experience. Brenell products present outstanding possibilities to those who wish to purchase a complete tape recorder and those who prefer to purchase decks and amplifiers for building into their own design of furniture or with existing Hi-Fi equipment.



1



3

1. **Mk. 5 DECK.** 4 operating speeds, four heads can be fitted, 8½" spools accommodated.

Only two switches (interlocked for safety). These control record, playback, wind and rewind and have extended shafts for fitting extra wafers if necessary. 28 gns.

3. **Mk. 5 RECORDER.** Incorporating the Mk. 5 deck. Four recording speeds 1½, 3½, 7½ and 15 i.p.s. Permits use of 8½" reels (2,400 ft. of tape for long play. 1½ i.p.s. over 8 hours). Three independent motors. Monitoring facilities. Fast rewind (1,200 ft. in 45 seconds). 64 gns. including 1,200 ft. of tape.



2



4

Full details of these models are available from Brenell Engineering Co. Ltd.—the sole manufacturers.

2. **3 STAR.** Three speeds (7½, 3½ and 1½ i.p.s.) with frequency correction at each speed. Push button control. Mechanical interlock. Pause key. Printed circuit amplifier. Separate bass and treble controls. High quality speaker (8" x 5"). Approved by Council of Industrial Design. 58 gns. including 1,200 ft. of tape, spool and microphone.

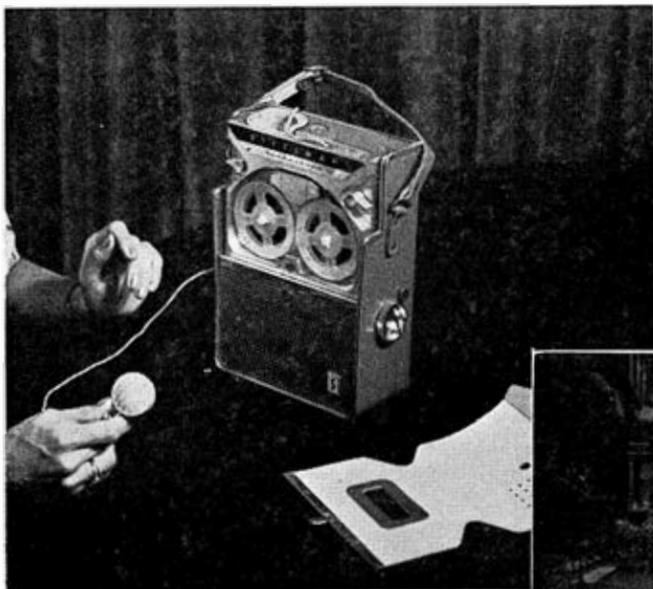
4. **STEREO REC/PLAYBACK.** Record and replays stereo also monaural (half track). Plays directly from gram pick-ups—stereo or monaural. Frequency compensation at 3 speeds (7½, 3½ and 1½ i.p.s.). Two modulation indicators—one for each track. Two speakers within cabinet. 89 gns. or with two microphones 95 gns.

TELEC TRONIC LIMITED

Sole U.K. concessionaires for the
S T E E L M A N

transitape

PORTABLE FULL-FEATURE TAPE RECORDER



A fully transistorised two-speed battery operated tape recorder offering high grade recording and playback anytime, anywhere.

Up to sixty minutes playing time from one 3" reel. Genuine leather case and shoulder strap make the TRANSITAPE easy to carry and welcome everywhere . . . whether on business or on pleasure. Full range of accessories available.



*... and a complete range
of high quality gramophone
and radio equipment*

Telec Tronic Limited

46/7 Frith Street,
London, W.1
GER 5952

Stand 44
Demonstration Room 311
Office 309

four examples from the **Grampian**
range of QUALITY EQUIPMENT



**Stereophonic and
High Fidelity equipment**

**The DP4 microphone
makes the most of any
Tape Recorder**



**“ Valencia ”
multi-purpose music
amplifiers for the guitar
and other instruments**

**Public Address equipment
of every type**



**The name Grampian has been associated with
quality Sound Reproducing equipment for many
years. A complete range of Microphones, Ampli-
fiers, Loudspeakers and all accessories is available
for Amateur, Professional and Industrial use.**

**STAND NO. 16
ROOM NO. 161**

Grampian

REPRODUCERS LIMITED

HANWORTH TRADING ESTATE, FELTHAM, MIDDLESEX.

Telephone: Feltham 2657/8.

See and hear Audiomaster Star Equipment!

Audiomaster

Brecon Stereo Unit

8 watts per channel. Distortion 0.5% at 6 watts, 1% at 8 watts, response 40 c/s—15,000 c/s \pm 2 db. For cabinet or panel mounting to order. **£33.15.0**



Audiomaster Mono Tape Amplifier

Contains record channel and separate playback channel.
BOTH THESE UNITS ARE SELF-POWERED

Audiomaster Stereo Tape Amplifier

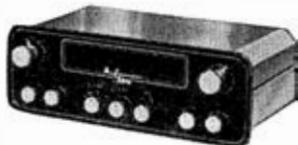
For use with the Harting deck using Telefunken heads. Amplifier contains two record channels easily monitored by a 1-inch Cathode Ray Tube. **£33.15.0**



Audiomaster

'Colwyn' Stereo Amplifier and Pre-amplifier

A new pre-amplifier with a very full specification at a modest price. Input sensitivity is high enough for any magnetic pickup but a handy switch enables crystal pickups to be used without further adjustment. Pre-Amp 21 gns. Power Amp 24 gns.



Audiomaster

'Conway' Stereo Control Unit

Plays direct from tape heads with a sensitivity of 2 mV. **£28.10.0**

The Audiomaster range offers new products, carefully designed to offer maximum interchangeability, with new finishes, new high performance standards. Make sure your listening plans for 1960 include Audiomaster.

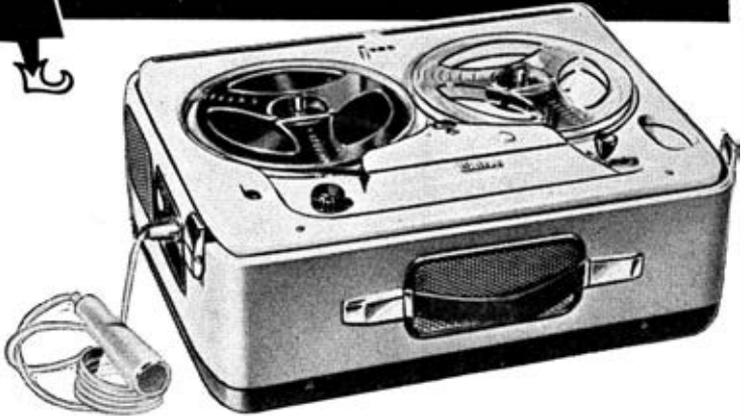
W. & n. electronics LTD

80-82 Uxbridge Road, Ealing, London, W.13

Telephone: EALing 4774 (3 lines)



Enthusiasts!...



**HERE'S A RECORDER
TO GET ENTHUSIASTIC ABOUT!**

BRITISH THROUGHOUT

***Walter* 505**

This is a set for the connoisseur—a set for the hi-fi fan. It gives absolutely top performance at anything but top price! Rich low notes, brilliant high frequencies, excellent dynamic range—all adding up to an uncanny 'three dimensional' quality of sound. Before you make up your mind, listen to a Walter 505—it speaks for itself!

- 2 speeds: $3\frac{3}{4}$ " and $7\frac{1}{2}$ " per sec.
- Modern pencil type microphone.
- 4 watts undistorted output through 2 speakers—enough volume to fill a medium size hall.
- Sockets for recording from microphone, radio set, gramophone pick-up or Walter telephone attachment.
- Sockets for extension speaker or external hi-fi amplifier monitoring through internal speaker while recording.
- 12 MONTHS GUARANTEE.

Be sure to see and hear our new models in

DEMONSTRATION ROOM 122

Walter

INSTRUMENTS LIMITED

GARTH ROAD, MORDEN, SURREY. TELEPHONE: DERWENT 4421/5

BUTOBA —two machines in one!



See it on Stand No. 40 and Demonstration Room No. 356

As the demand for tape recorders advances so does the buying public's technical knowledge. The wise retailer, therefore, offers the most advanced set. The **Butoba**, introduced to Britain for the first time, is certain to capture the imagination of discriminating customers everywhere, for this compact, attractively-styled recorder is **two machines in one**.



At home, it can be mains operated, and out-of-doors—in the garden, on picnics, or even in the car—inexpensive, long-life batteries give full-tone reproduction.

Fully transistorised **Push-button operation** **Two-speed and twin track**
Built-in loudspeaker **Tone and volume controls** **2 watt output**
Only 69 gns. (Mains converter 11 gns. extra)

Write for full details to:

DENHAM & MORLEY LTD. (Radio Sales Division)
 173-175 Cleveland Street, London, W.1 Telephone: EUSton 3656-7

MAJOR announcement from ELIZABETHAN



**New model with
performance standards
not previously available in any
portable tape recorder 65 gns.**

STAND No
18
DEMONSTRATION
ROOM
348

The introduction of the new Elizabethan Major is an event of great importance in the tape recording world.

Without exaggeration, this superlative machine offers a standard of performance and a range of facilities only found previously in the highest grade of professional equipment.

The frequency response, for example, is phenomenal. A specially fitted 3 micron gap recording head ensures that recordings are up to the highest professional standard—and a recording level meter enables the

standard to be kept *uniformly* high.

The 6 watts, push-pull output into the twin-speaker system results in a performance of an order not previously available in any portable machine. This without the use of extension speakers or amplifiers—although provision is made for them. The instrument itself is housed in a handsome, professionally styled cabinet with a total weight of only 35 lb. Microphone optional extra.

If your standards are professional standards, the new Elizabethan Major is the tape recorder for you.

ELIZABETHAN

TAPE RECORDERS

major

and to complete the Elizabethan Range for 1960

AVON . . . most popular, most popularly

E.A.P. (Tape Recorders) Ltd., Bridge Close, Romford, Essex.

PRINCESS . . . Elizabethan best-seller. Push-button performance. Superb sound for only 39 gns.

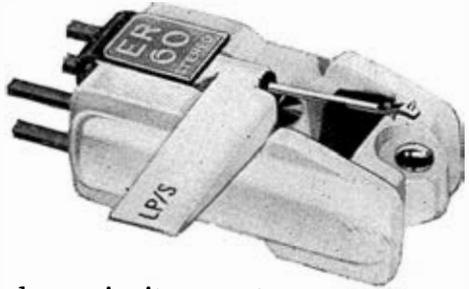
Tel.: Romford 62366/7

Hear them and see them

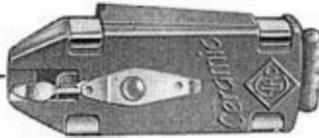
DEMONSTRATION ROOM 347

"STEREO 60"

(CERAMIC)

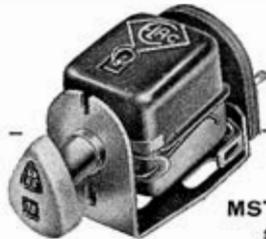
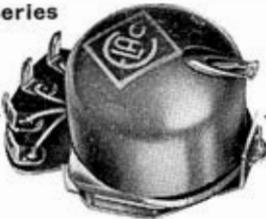


Electronic Reproducers invite you to Demonstration Room No. 347, to hear and inspect their range of world-famous gramophone pick-up cartridges



VARIABLE RELUCTANCE CARTRIDGES

STS 210 & 310
series



MST 1 & 2
series

Specialists in the design and manufacture of
gramophone pick-up cartridges

ELECTRONIC REPRODUCERS LIMITED

and associate companies

Porters Wood, Industrial Estate, Valley Road, St. Albans, Herts

HEAR IT IN ROOM 212, BOOTH 6



New battery portable with mains quality!

The convenience of battery power and true portability. The quality reproduction of a mains tape recorder! Now you can have the best of both worlds, with the new all-British Minivox battery portable.

The overall measurements of the Minivox are $10\frac{1}{4}$ " x $5\frac{1}{4}$ " x 9". And the weight is only 9 lbs. Yet no flimsy plastics have been used in this amazing little machine. The deck is of $\frac{3}{8}$ " duralumin, and that's typical of the standard throughout.

The British Minivox is robust and precision engineered. Built like a first-class mains machine. The same goes for the circuitry.

The Minivox is the only battery portable that employs **seven** transistors and **three** constant speed motors. In fact, it's the ingenious circuit, the meticulous attention to detail that makes the Minivox the only **battery portable** that gives you **mains quality**. But come to Room 212 (Booth 6) for a demonstration—hear music reproduced. Then judge for yourself. Price only 37 gns. including microphone!

MINIVOX 37 gns. including microphone

Manufactured by the Challen Instrument Co.

HEAD OFFICE AND WORKS: 1, St. Michael's Road, S.W.9. BRI 0779

LONDON OFFICE AND SHOWROOMS: 4, Stratford Place, W.1. MAY 5054

amateur TAPE RECORDING



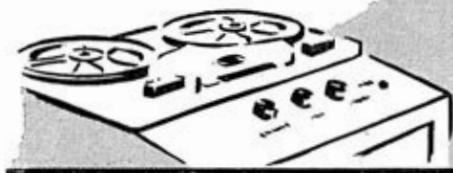
THE **TOP** MAGAZINE FOR **TAPE** ENTHUSIASTS

The Official Magazine
of the
BRITISH RECORDING CLUB
The Largest Organisation
of its kind in the world

*We shall be pleased
to see you on*
STAND 67

Published on 20th of each
month price 1/6d.

Order your copy now—just
for the fun of it, from your
newsagent, or direct from
A. T. R. MAGAZINE,
145 Fleet Street, London, E.C.4



Trixette

**REPRODUCERS
RECORDERS
AMPLIFIERS**



TRIXETTE COMET TAPE RECORDER

The Comet, a completely British-made tape recorder, embodies many unique features with a Magazine-loading device for the utmost simplicity and convenience.

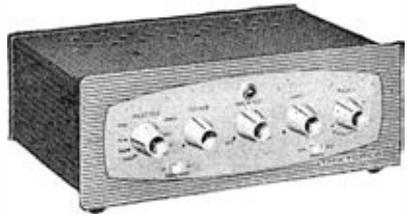
With this unit, the size of the tape reel is no longer of any importance as the Magazine can be changed in literally two seconds. There is no tape threading to be done and no spilling or overrunning of the tape. Clarity and quality of recording and reproduction are exceptional, and better than the results obtained with many instruments at much higher cost.

Price : **35 GNS.**

Other TRIXETTE Tape Recorders include the "COMPANION" and "EVEREST" types.

STEREO/ MONO AMPLIFIER Model XT202

Provides High-Fidelity reproduction of both stereo and standard records with control panel and amplifier in one integral unit. Outstanding performance and finish **22 GNS.**
at



These models and many others in the TRIXETTE range as well as examples of TRIX Industrial and Public Address Audio equipment can be examined in Demonstration Room 261 and Booth 49.

THE TRIX ELECTRICAL CO. LTD.,

MAPLE PLACE, LONDON, W.1.

Tel. : MUSeum 5817 (6 lines).



TANNOY
LIMITED

TANNOY
PRODUCTS LTD.

TANNOY
RENTALS LTD.

*the
things
they
do*

TANNOY
(AMERICA) LTD.

TANNOY
(CANADA) LTD.

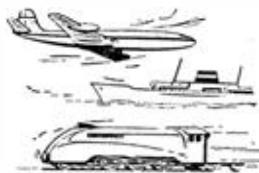
TANNOY
MARINE LTD.

Sound reinforcement and multi-lingual interpretation systems by Tannoy are chosen for the Houses of Parliament London, Ottawa and New Delhi; for U.N.O. Headquarters New York

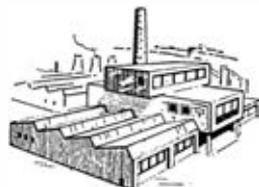


for the conferences of S.H.A.P.E., N.A.T.O., U.N.E.S.C.O.; and those of numerous public bodies and industry . . .

Sound communications for ships, railways, airlines and airports . . .



for hundreds of industrial plants including some of largest in the world . . .



and a long tradition with the armed services in war and peace . . .

In the world of Hi-Fi Tannoy loudspeakers, amplifiers and pick-up are an acknowledged standard of quality . . .

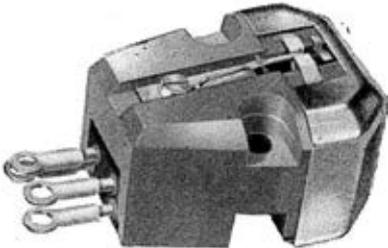
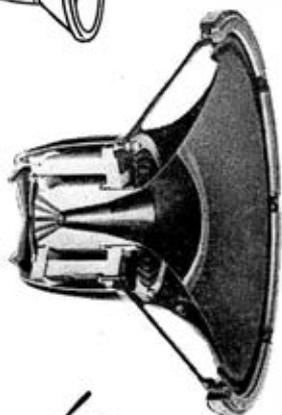


Tannoy Marine equipment spells safety for mariners with gas detectors, ventilators and the famous Hey-Loh loud hailer.

TANNOY PRODUCTS LIMITED WEST NORWOOD LONDON, S.E.27
Founder Chairman: Guy R. Fountain Telephone: Gipsy Hill 1131



*Products
of
Experience
&
Leadership*



THE *Monitor* UNITS

THE **VARI-TWIN MK II**
Compatible Stereo Cartridge

latest in the long line of Tannoy Dual Concentric Loudspeakers mark another Tannoy achievement. From the introduction of the first Dual Concentric Loudspeaker, Tannoy have won an established place as the quality standard for faithful reproduction. The Monitor Unit embody all the unique features of the earlier, widely acclaimed, 12" and 15" Units, but include the revolutionary Magnetic Shunt, and the H.F. Acoustic Balance Cavity, both important contributions to improved quality of reproduction.

This triumph of Tannoy research provides a magnetic stereo cartridge completely hum-free. Mounting in close proximity to motors and power amplifiers is now a practical proposition. The Vari-Twin Mk II is designed for micro-groove stereophonic discs made to Westrex 45/45 system. It is however, fully compatible and, with appropriate stylus, monaural discs may be played. It can be mounted in any standard shell or arm suited to its low tracking pressure of 3-4 grms.



Founder Chairman: Guy R. Fountain

TANNOY PRODUCTS LIMITED • WEST NORWOOD • LONDON S.E.27

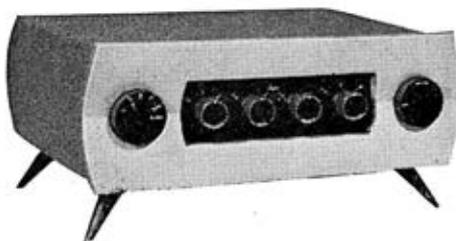
One of the Tannoy Group of Companies

Chapman

lead with quality and elegance

Our standard of excellence is reflected in the continual reliable performance of Chapman equipment throughout the world. For those prepared to spend a little more Chapman products will prove an outstanding long-term investment.

THE FINEST BRITISH COMPONENTS
FULLY TROPICALISED THROUGHOUT
USE OF SOUND DESIGN TECHNIQUES
STRINGENT QUALITY CONTROL
AND TESTING
ALWAYS UP TO SPECIFICATIONS
CONTEMPORARY STYLING



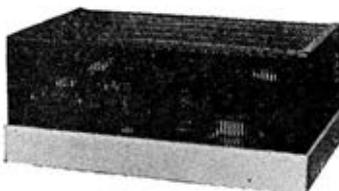
The 305 is a comprehensive stereo or single-channel control unit and affords every facility for high-quality stereo or single-channel radio, gram and direct or pre-recorded tape reproduction without a separate pre-amplifier.

305 Stereo Control Unit 18 Gns

Rated at 8 watts per channel this compact double push-pull amplifier is designed for use with a high-quality stereo system.

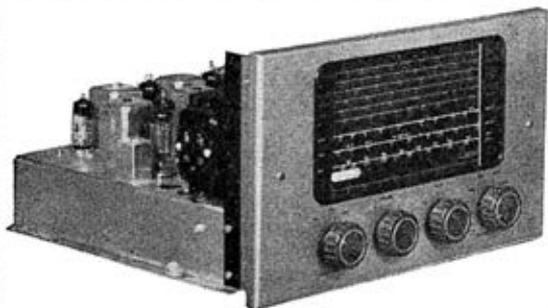
It is especially suitable for direct connection to our 305 Stereo Control Unit.

305 Stereo Main Amplifier 20 Gns



This is the finest AM/FM tuner in our range and combines the stability and sensitivity of a first-class communication-type receiver with the low distortion and wide frequency response required of the modern high-fidelity amplifier.

56BS/FM Tuner £67.10.0



C. T. CHAPMAN (REPRODUCERS) LIMITED

Chapel Lane High Wycombe Buckinghamshire
HIGH WYCOMBE 2474



irish

AMERICA'S
FAVOURITE
TAPE

STAND 3



Brown Band 195 (Acetate base)

600'	5" spool	17/-
850'	5½" spool	23/-
1,200'	7" spool	27/6



Long Play 601 * (Mylar base)

900'	5" spool	28/-
1,150'	5½" spool	35/-
1,800'	7" spool	50/-



Green Band 211 *
(Acetate base)

600'	5" spool	21/-
850'	5½" spool	28/-
1,200'	7" spool	36/-



Double Play 724 *
(Tensitized Mylar base)

1,200'	5" spool	45/-
1,650'	5½" spool	52/6
2,400'	7" spool	80/-

* Ferro-sheen process



Chitnis . . .

**A NAME TO
REMEMBER IN
TAPE-RECORDING**

CHITNIS Tape Recorders are the logical embodiment of the finest trends in Continental recorder design, coupled with standards of manufacture and exclusive techniques to provide instruments of outstanding quality and reliability. Thus they may be said to be the ultimate in modern recorders, as pleasing to the professional user as to the family. CHITNIS Recorders (Made in W. Germany) are characterised by compactness and elegance of design, by better accessibility of controls, by fine performance, and above all, by quality that's years ahead.

**TWO-SPEED
2 AND 4 TRACK
MONO AND STEREO
RECORDERS**

Chitnis Electronics Ltd.
1, LONG ACRE, LONDON, W.C.2 COVent Garden
2052



● COMPLETE WITH DYNAMIC MICROPHONE AND TAPE

GENERAL SPECIFICATION

- Both models housed in cases of neutral beige with gilt metal finish, in elegantly curved styling with domed lid. Fitted with lock and key and strap handle.
- Response—At $3\frac{3}{4}$ " /sec.—30-16,000 c/s ± 3 dB.
At $1\frac{1}{4}$ " /sec.—30-10,000 c/s.
These remarkable standards come from the Bogen Record/Replay and Erase heads fitted. (Gap—0.0001375")
- Inputs—Microphone—3mV at 2 Megohms; Radio—3mV at 10 K ohms; Pick-up—100mV at 1 Megohm.
- Outputs—3 watts at 5 and 15 ohms for external speaker; 500mV at 100 K ohms for external amplifier.
- Signal to Noise ratio—Better than 55dBs unweighted. Wow and Flutter—0.12% at $3\frac{3}{4}$ i.p.s. combined.
- 2-speeds— $3\frac{3}{4}$ " per second for high-fidelity standards; $1\frac{1}{4}$ " per second for average requirements and tape economy.
- Recorder stops automatically at tape end, or if tape should break. Lock and key on case.
- Speed and track selection, pause, super-impose, mixing on mic. and radio inputs; monitoring; separate bass and treble on output. Fluorescent signal level indicator. Tape position indicator. Fast rewind, less than $2\frac{1}{2}$ -minutes.
- Heavy duty Papst Motor ensures positive instantaneous response in all operations. Weight, approx. 19lbs. Tape reel size, $5\frac{3}{8}$ " max. Complete with CHITNIS Dynamic Microphone and reel of tape.

KM.22
TWO TRACK
54 GNS.

KM.33
FOUR TRACK
62 GNS.

*Chitnis M.50 TR Dynamic
Microphone if purchased
separately — 5 gns.*

SEE THE COMPLETE RANGE

STAND
No.

11

DEM.
ROOM

113

PLEASE ASK FOR LEAFLETS



TRUVOX

ALL THAT THE NAME IMPLIES...



Model R7
Tape Recorder



Model R6
Tape Recorder



Model MK6
Tape Deck



DEMONSTRATION ROOM

334

STAND NO.

57

Truvox Ltd., Neasden Lane, London NW10.



STC MICROPHONES

for the perfectionist



The 4105 microphone is a moving coil pressure-gradient microphone with a cardioid response obtained by using an acoustic phase shifting network. It is small, unobtrusive and robust.

The 4038 ribbon microphone is a pressure-gradient microphone which sets a new high standard of fidelity. It is accepted as one of the world's best microphones and is widely used by the foremost broadcasting authorities.

ALSO IN THE STC RANGE :

- | | |
|--|------------------------------------|
| 4104 Lip Microphone | 4033 Cardioid Microphone |
| 4037 Pencil Microphone | 4032 Hand Microphone |
| 4035 General Purpose Microphone | 4021 Moving Coil Microphone |

STC ALSO MANUFACTURE:

audio amplifiers, loudspeakers, and specialise in the design, installation and maintenance of Sound Reinforcement Systems to meet individual requirements.

See us on Stand 35

where a range of Brimar Valves is also displayed.



Standard Telephones and Cables Limited

**PUBLIC ADDRESS DEPARTMENT
CONNAUGHT HOUSE • ALDWYCH • LONDON • W.C.2**

GOODMANS



AXIOM 110

The first full range 10" High Fidelity Loudspeaker. Ideal for all domestic stereophonic or monophonic installations. Plastic-edged hyperbolic diaphragm ; Aluminium voice coil. Die-cast chassis. 10 watts. 40-15,000 c/s. Price £3.15.9 plus P.T. £1.4.3.



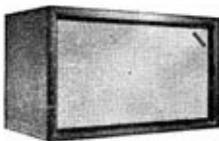
AXIOM 300

The most advanced twin-cone High Fidelity Loudspeaker yet produced, incorporating new developments which reduce distortion to a very low level and provide exceptionally smooth and extended response. 15 watts. 30-16,000 c/s. Price £11.5.9.



TRIAXIOM 12/20

A complete Triple Element High Fidelity Loudspeaker having all three radiating elements integrated into one unit. It is designed to provide a very wide frequency range with exceptionally low distortion and is constructed in accordance with the highest engineering standards. 20 watts. 30-20,000 c/s. Price £25.0.0.

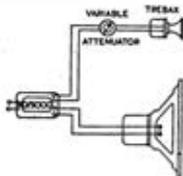


A.L./120

An extremely compact full range triple concentric radiator High Fidelity Loudspeaker system engineered to provide full scale performance at the lowest possible cost and in the smallest possible space. The A.L./120 measures only 24" x 11½" x 14¾". 15 watts. 35-20,000 c/s. Now available in walnut or mahogany finish. Price £29.10.0.

A.L./100

A new High Fidelity Reproducer, with twin concentric radiators and resistive enclosure loading. Dimensions as A.L./120. 12 watts. 35-15,000 c/s. Available in walnut or mahogany finish. Price £22.10.0.



'Stage-Built' SYSTEM

GOODMANS 'Stage-built' system is a method of building up a multiple unit High Fidelity reproducer having a performance of the highest order. Each stage is a complete full range High Fidelity reproducer, which is improved by the addition of the next stage.

GOODMANS

Contribution to the HIGH FIDELITY FIELD



James Moir

Technical Director of Goodmans Industries and author of "High Fidelity Sound Reproduction".

GOODMANS HIGH FIDELITY LOUDSPEAKERS are developed in this Laboratory, whose staff also carry out regular checks at all stages of manufacture to ensure design standards of performance. Constant re-

search and development ensures that the field is led and not followed, and by attention to detail in all phases of design and production a TRADITION OF EXCELLENCE is upheld.

for High Fidelity

Tel.: WEMbley 1200 (8 lines) Grams: Goodaxiom, Wembley, England
largest exporters of High Fidelity Loudspeakers



Only with **FI-CORD** can you have it both ways—
really HI-FI and really portable

Don't be misled by the compact size. The **FI-CORD** is a high fidelity instrument of advanced scientific design — assuring true-to-life recordings.

Frequency 50—12,000 c.p.s. ± 3 db. Tape speeds $7\frac{1}{2}$ i.p.s. and $1\frac{1}{2}$ i.p.s. Twin track record/playback, using standard $3\frac{1}{2}$ " spools.

Wherever you go, you can take your **FI-CORD** with you, it is ideal for adding the realism

of sound to movie films.

The **FI-CORD** weighs only $4\frac{1}{2}$ lbs., measures $9\frac{1}{2}$ " x 5 " x $2\frac{3}{4}$ ", operates in any position (lid open or shut) and requires no power point. It runs on 4 batteries, rechargeable from the automatic charger supplied.

Built-in speaker. Full playback volume. Extension speaker socket. Dynamic microphone with stop/start switch.

CATCH IT—AND KEEP IT—WITH

FI-CORD

See and hear the **FI-CORD**

Stand 9

Demonstration Room 254

Complete with
Microphone,
Tape, Charger
and Batteries **59GNS**

or with Gramplan
DP4M
Microphone **66GNS**

FI-CORD Ltd · 40a Dover St · London W.1 · Tel: HYDe Park 3448

PERIPHONIC

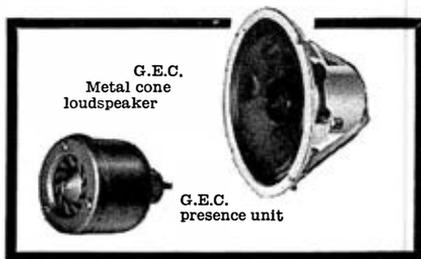


In a triumph of sound reproduction achieved with two "air-coupled" G.E.C. metal cone loudspeakers and associated G.E.C. presence units, the G.E.C. Periphonic system (at 10 watts input) cuts harmonic distortion to 2.7% at 40 c/s. and 0.3% at 1,000 c/s.!

Exclusive to G.E.C., the metal cone loudspeakers give low inter-modulation distortion, and full response at the low bass frequencies while the presence units have extremely smooth high frequency response and excellent transient performance. The combination forms a complete system with full 9 octave realism and wide angle sound distribution.

Units are available separately or as the Periphonic system in a range of cabinets of entirely new acoustic design.

the **G.E.C.**
loudspeaker system
that cancels distortion



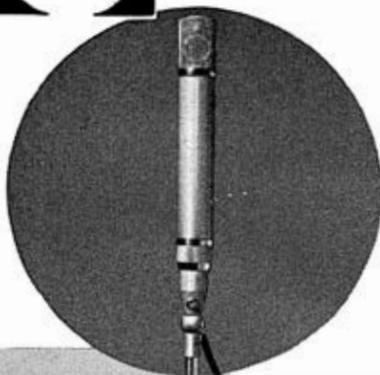
HIGH QUALITY SOUND EQUIPMENT

Metal Cone Loudspeakers · Presence Units · Stereophonic Systems
Periphonic Loudspeaker Systems · Pre-amplifiers · Amplifiers

Write today for details to THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, W.C.2

AKG *in the*

C.12



D.19/B
on ST/19 Desk Stand

D.9



K.50



STAND 34
DEMONSTRATION ROOM 312

service of sound

AKG Microphones are to be found in the leading broadcasting, TV, film and recording studios throughout the world. The very wide range of types available extends from condenser microphones with facilities for varying their directional patterns whilst in use, to models for professional use in all spheres and others for domestic tape recorders. Model D.88, a new stereo dynamic instrument is typical of AKG enterprise in producing good microphones for specialised requirements. Please ask for leaflets.

C.12

Condenser microphone. Its directional characteristics may be varied by remote control during use without change in level. Individual frequency response curve with each model. *Other Condenser Types—C.26, C.28, C.29, C.30 and stereo model C.24.*

STUDIO DYNAMIC TYPES AVAILABLE

in a comprehensive range.

D.19/B

High quality cardioid dynamic with extended frequency range from 40-15,000 c/s. Available with bass cut compensating switch.

D.9

Omni-directional general purpose dynamic in high, low or dual impedances.

D.88—STEREO

Twin dynamic cardioid in high or low impedance (line transformer available). Response 80-15,000 c/s. Eminently suitable for the modern stereo tape recorder. For stand mounting.

D.11/N

A new popularly styled dynamic microphone for the tape recorder. Cardioid pattern. Exceptionally fine design and characteristics. Frequency response 80-13,000 c/s. Front to back ratio 15dB.

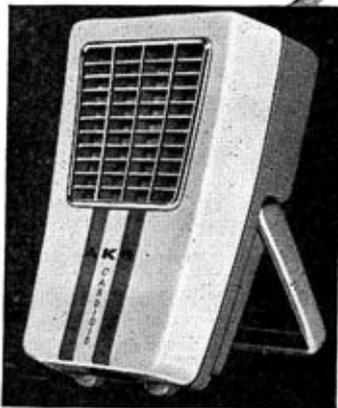
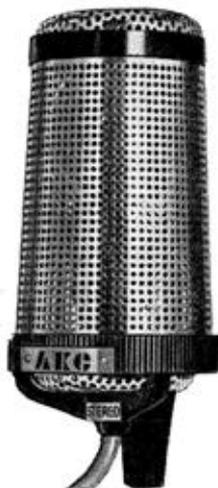
K.50 HEADSET

Featherweight. Frequency range 30-20,000 c/s. Available for mono or stereo use. Requires less than 0.5 milliwatt power. 5,000 Ω version available.

ST.200 SHOCKPROOF STAND

Fully transportable and folds easily. Completely shockproof.

D.88



D.11

AKUSTISCHE-u. KINO-GERÄTE GMBH

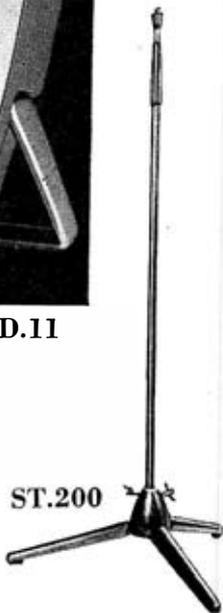
VIENNA, 15. AUSTRIA

Sole Agents for U.K. and British Commonwealth

POLITECHNA (LONDON) LTD.

357 EUSTON ROAD, LONDON, N.W.1

Tel: EUSton 5851



ST.200

The man who knows what's inside says:
You get more out of

TELEFUNKEN



TELEFUNKEN *Magnetophon* 75K-15

TWO TAPE SPEEDS 3½ ips and 1½ ips.
FREQUENCY RANGE 60-16,000 cps at 3½ ips and 60-9,000 cps at 1½ ips
PLAYING TIME 6 hours 20 minutes (5½ in. DP tape at slow speed)

Press button controls. Extra-sensitive braking and tape tension control system. Recording head with ultra-fine gap. Indirect flywheel drive. Connections for earphones, remote stop/start control and extension speaker. In attractive lightweight Styron Case. **52 GNS.**

(excluding microphone)

TELEFUNKEN *Magnetophon* 76K

Four TRACKS provide a playing time of 12 hrs. 40 mins. from one 5½ in. DP tape. Two speeds with frequency response of 30-16,000 cps at 3½ ips and 30-9,000 cps at 1½. D.C. heating of valves. Transistorised pre-amplifier stage. Four tracks facilitate perfect superimposition. One track may be monitored through earphone while the other track is being recorded. Simultaneous two-track playback.

(excluding microphone) **64 GNS.**

TELEFUNKEN *Magnetophon* 85KL

Six watt push-pull power stage, two matched oval speakers with cut-out switch, volume control, and separate bass and treble tone controls. Straight-through amplifier facilities. External speaker connection. Continuously variable trick control can be fitted. In luxury case.

(excluding microphone) **79 GNS.**

Studio Equipment

A range of Telefunken studio equipment will also be demonstrated

SEE US
AT THE
FAIR

TELEFUNKEN

The originators of Tape Recording

WELMEC CORPORATION LTD., 147/8 STRAND, LONDON, W.C.2

Stentorian

**ON DISPLAY. SEE
THEM ON BOOTH No. 4**

The items illustrated are representative of the wide range of W.B. Hi Fi equipment. A noteworthy recent addition is the "Stentero" Stereophonic Speaker System embodying many novel features. Our experience in sound reproduction covers 33 years: such a background is a guarantee of quality. Full details of all W.B. products will gladly be sent on request.



W.B.8 Amplifier £19.19.0.



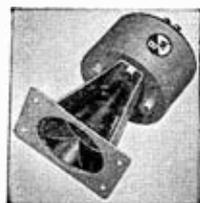
W.B. 8S Stereophonic Control Unit £22.15.0.



Stentorian Cambric Cone Hi-Fi Units.

The famous H.F.1016 at £7.12.3.
Others from £1.5.6.

Ready-to-assemble cabinets in polished walnut from £5.10.0 to £16.16.0.

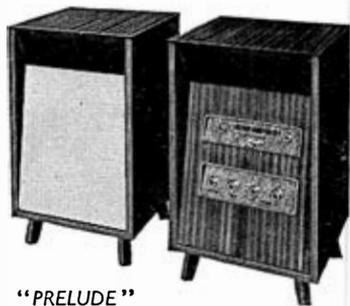
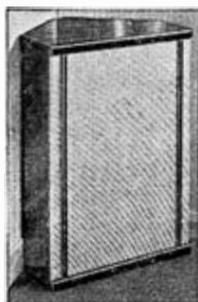


Tweeter Units from 3/3 to £12 12.0.

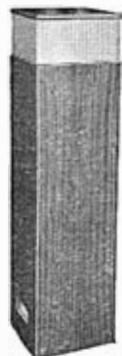
Prelude Horn-Loaded Cabinet £19.10.0.

H.F. 817 Speaker £10.16.6.

Stentorian Extension Speakers from 60/-



"PRELUDE" ready-to-assemble cabinets in striped sapele from £9.19.6 to £13.13.0.



COLUMN LOUDSPEAKERS Cabinet for H.F.816. Unit £18.18.0. Cabinet for H.F.610 Unit £9.19.6.



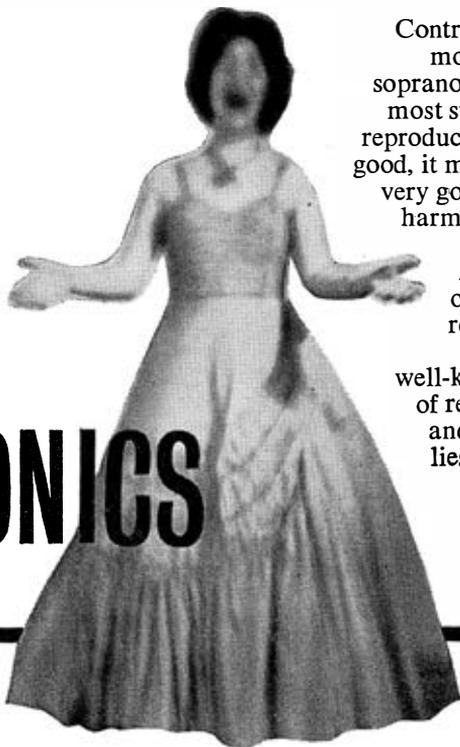
See and hear all W.B. products at the Audio Fair, Booth 4, Demonstration Rooms 304 & 5

WHITELEY ELECTRICAL RADIO CO. LTD • MANSFIELD • NOTTS

W.B.110

Telephone: MANSFIELD 1762-5

HEAR THE HARMONICS



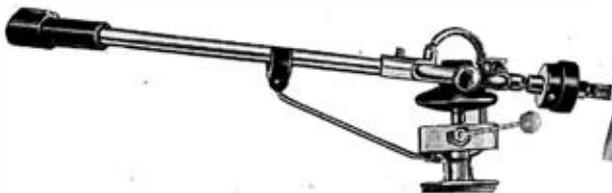
Contraltos can be most contrary, sopranos can sound most surprising. If reproduction is to be good, it must be very, very good; without harmonics, it can be horrid.

At the heart of fine sound reproduction in many a well-known make of record player and radiogram lies an Acos or ACOStereo cartridge or pick-up.

ON THE ACOS HI-LIGHT

The new Acos Hi-Light is undoubtedly one of the finest mono and stereo pick-ups in the world. The frequency range is from 20-20,000 c/s \pm 3 dB. The tracking weight is less than 1 gramme (mono) and 2 grammes (stereo), which virtually eliminates record wear.

The Acos and ACOStereo ranges include a number of well-known mono cartridges and pick-ups, the eminently successful 71 and 73 stereo cartridges, and Acos x 500 tested replacement styli. Acos Mic 39 and 40 microphones are unsurpassed for performance, looks and price, and a new ACOStereo microphone is now being introduced.

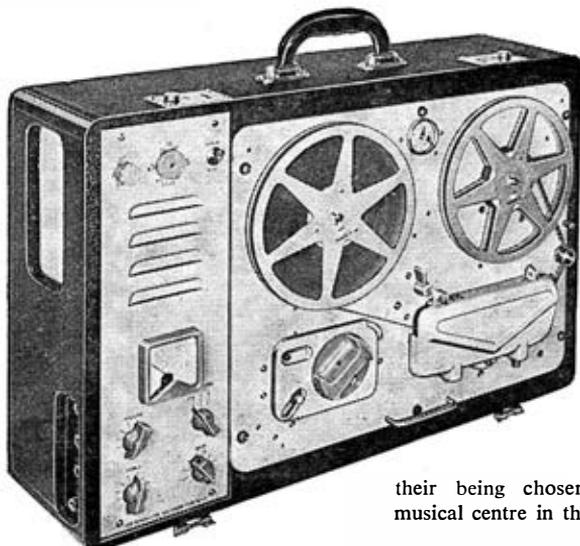


acos

ARE DOING THINGS IN STYL!
DEMONSTRATION ROOM 111, BOOTH 65.

COSMOCORD LTD., WALTHAM CROSS, HERTS. Telephone: Waltham Cross 25206

Vortexion



The W.V.A. tape recorder now has provision for Stereo plug - in heads to enable this recorder to replay Stereo. The regular models are retained with additions and improvements. Our high standard, which has made these recorders famous, has been maintained, resulting in

their being chosen for the foremost musical centre in this country.

FOUR CHANNEL ELECTRONIC MIXER

This is a studio quality electronic mixer suitable for any climate. The controls are hermetically sealed, and great care and selection of components to make certain reliable low noise operation, and individual screens prevent break through. The built-in power transformer is screened and potted, and all the microphone transformers are individually potted in selected heavy gauge Mumetal boxes. Front or rear inputs and outputs may be obtained to order. The normal output is .5 volt, 1.m.w. 600 ohms also available.

The 3-CHANNEL MIXER and PEAK PROGRAMME METER is similar to the above but has the additional meter fitted calibrated in 2 db steps from -20 db to + 12 relative to 1.m.w.-600 ohm. The meter is fed by the full P.P.M. 1 second time delay circuit which includes a stabiliser valve, to ensure accurate gain and calibration. The standard output is screened primary and 1.m.w.-600 ohm balanced or unbalanced by switch. Inputs and outputs may be at the front or rear, and rack panel mounting is available at the same price.

10/15 watt Amplifier with built-in mixers.

30/50 watt Amplifier with built-in mixers.

Stereo mixers—Stereo record play-back units, etc.

VORTEXION LIMITED

257-263, THE BROADWAY, WIMBLEDON, LONDON, S.W.19

Telephones : LIBerty 2814 and 6242-3

Telegrams : "Vortexion, Wimble, London."

fit Garrard for Good



MAGAZINE TAPE DECK

Unique design plus magazine loading makes tape recording and play-back easy and good.



MODEL TPA 12

Transcription Pick-up Arm designed for monaural and stereophonic record reproduction.



MODEL 301

The Transcription Motor for the connoisseur, used by the B.B.C. and broadcasting stations throughout the world.



MODEL 4HF

High quality single Record Player carefully designed to provide maximum reliability with fidelity of reproduction.



MODEL RC98/4

Can be used as a fully automatic record changer playing up to 8 discs or as a manually operated high-fidelity player.



SEE US IN
DEMONSTRATION
ROOM 218

GARRARD ENGINEERING & MANUFACTURING CO. LTD.

SWINDON • WILTSHIRE

Tel: SWINDON 5381 (5 lines) Telex 44-271

Reslo



accurately produced
and
quality finished
microphones
for all
sound transducing
applications

RESLOSOUND LTD.

LONDON ROAD • ROMFORD • ESSEX

the FANTABULOUS NEW Spectone 171

SORRY! we just had to coin a word to describe this amazing new tape recorder!

Modern, compact, neat and built to the



highest possible specification of quality that is synonymous with all SPECTONE Audio Equipment.



PLUS CASSETTED TAPES!

The latest and most sensible advance in recorder technique yet—the tape magazine. The reel of tape and take up spool are housed in a complete plastic container. All you have to do is take it, clip it, and away you go, no tape threading—one hand operation all the way.

**MAKE SURE YOU VISIT BOOTH No. 21
Demonstration Room No. 114**

Specto
LIMITED

SPECTO LTD.



39 Gns.

Inc. Full Cassette & Microphone.

Here is the tape recorder that possesses all the features you have come to expect, such as built in superimposition and mixing facilities, provision for external amplifier and speakers, variable monitoring during recording, etc., etc., but at a fraction of the usual size, weight and price.

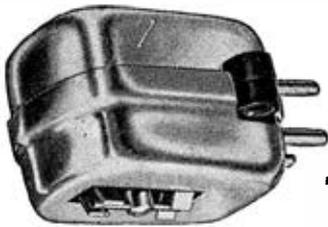
Write or 'phone now for new illustrated brochure, or see it at your local dealers.

VALE ROAD, WINDSOR, BERKS. Windsor 1241

"...of the highest class"

**GOLDRING Lenco
TRANSCRIPTION MOTOR, GL60**

"The motor . . . is extremely quiet." "The turntable . . . took 3½ minutes to come to rest from a speed of 78 r.p.m. An excellent testimony to smoothness of running." "Rumble . . . non-existent at normal settings." "No sign of 'wow'." ". . . the arm is excellent and will appeal especially to those who wish to change cartridges frequently." "As a final test a stereo cartridge was fitted . . . again no evidence of rumble . . . and the overall performance of the GL60 is so good that it can be recommended to those who want a transcription motor and arm of the highest class"—(Technical Report, "The Gramophone," May 1959.)



**GOLDRING "700"
STEREO CARTRIDGE**

Variable Reluctance: with 0.5 mil diamond stylus. Fits modern transcription arms wired for Stereo (e.g. Goldring G60 transcription arm as fitted to GL60 transcription motor).

...and for Monaural Reproduction
. . . the famous "600" Variable Reluctance Cartridge.

stereo equipment



by **GOLDRING**

GOLDRING MANUFACTURING CO. (GT. BRITAIN) LTD.

486-488 High Road · Leytonstone
London · E.11

Telephone: Leytonstone 8343

STAND No. 55
DEMONSTRATION
ROOM 217

Pamphonic

STEREO AMPLIFIER
MODEL 3001

This is our integrated audio amplifier with specially arranged pre-amplifier section for operation from both crystal and magnetic pick-up cartridges as well as stereophonic tape inputs. Separate Bass and Treble controls. Attractive design, finished in terracotta red with ivory panel, and suitable for panel mounting in furniture or free standing.

price **£35**

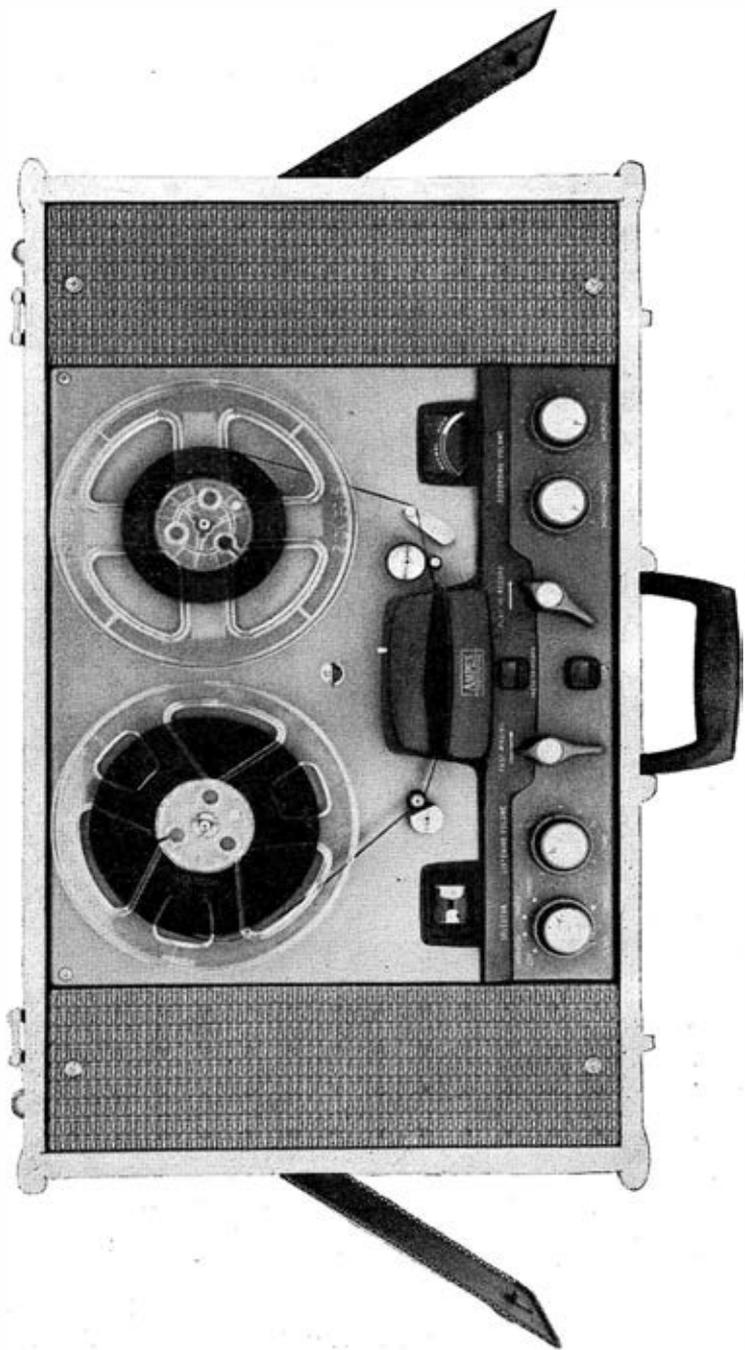


*Two types of
Pamphonic
matching
loudspeakers
are available
for use with
Model 3001*

Data for one channel, both identical

Power Output: 7.5 watts
Output Impedance: 15 ohms
Frequency Response: 40 c/s-20 Kc/s within ± 1 dB.
Hum and Noise: -60 dB. (all input sockets)
Overall Dimensions: 13" x 10 1/4" x 4 1/4"
Weight: 18 1/2 lb.

PAMPHONIC REPRODUCERS LTD
17 Stratton Street, London, W.1 Tel: GROsvenor 1926

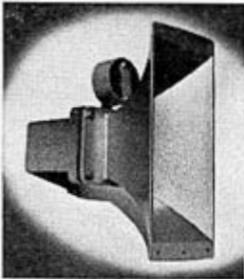


The Ampex recorder pictured at the left is the most unique stereo tape system available in Britain. Unlike any other portable, two adjustable baffles offer complete control over the effective spacing and direction of sound from the matched speakers. It operates at either $3\frac{3}{4}$ or $7\frac{1}{2}$ ips, records stereo, even sound-on-sound, and plays two or four track stereo tapes. This model 970 is actually only one of many Ampex tape recorders, components and systems that you are invited to see and hear at the London Audio Fair. These include amplifiers, speakers, single channel portables, stereo portables, and complete music systems housed in cabinets of crafted fruitwood, mahogany and walnut. Redwood City Engineering Ltd., Arkwright Road, Reading, Berkshire

AMPEX

FRANCHISES AVAILABLE - DEALER INQUIRIES INVITED.

by Stanley Kelly, design consultant to the Audio industry



THE KELLY RIBBON HF LOUDSPEAKER Mk 11

The ribbon Loudspeaker is acknowledged the most successful method of reproducing the higher audio frequencies. *Who better than Stanley Kelly to provide the practical reality? Who else would think of providing a genuine Response Curve with each Unit taken from the actual speaker?*

Brief specification.
Frequency Range: 2Kc/s to 20Kc/s
within -1 & $+2$ dB. \geq Micron Aluminium
Ribbon (shock resistant, reducing
distortion).

Built-in matching transformer.
Power Capacity: Up to 10 watts
maximum.
Impedance: 15 ohms nominal.
rice 10 gns

THE KELLY WOOFER UNITS

Mk I & II

Designed to meet exacting requirements for reproducing the lower frequencies. Recommended for use with a first-class H.F. Unit (preferably the Kelly RIBBON Mk II). Two externally similar models—Mk I & II—are available. Both models incorporate many unique design features and have been engineered to maintain consistent high quality performance.

Price Mk I—2" voice coil unit 14 gns.
Price Mk II—4" voice coil unit 24 gns.



KELLY ROMAGNA MICROPHONES

An entirely new design concept for Microphones, providing high quality performance with Crystal, Magneto Dynamic, and Ribbon models. Full details and response curves available. *SK performance and quality at very low cost.*

Crystal 25/-
Magneto Dynamic 39/6
Ribbon 59/6

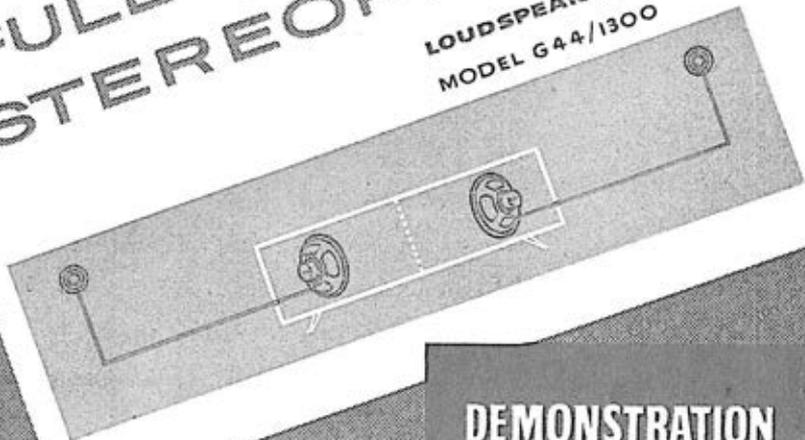
ROMAGNA  REPRODUCERS

ENFIELD · MIDDIX.

Factory Sales representatives: K. H. Williman & Co. Ltd.,
Blackford House, Sutton, Surrey. Phone: Vigilant 3700, Melville 1491

CELESTION

FULL WIDTH STEREOPHONIC LOUDSPEAKER SYSTEM MODEL G 44/1300



**DEMONSTRATION
ROOM
NO 352**

Rola Celestion Ltd.

FERRY WORKS · THAMES DITTON · SURREY · ENGLAND

Telephone: EMBerbrook 3402/5

Cables: VOICECOIL, THAMES DITTON, ENGLAND

**STAND NO
51**

LOUDSPEAKERS FOR ALL PURPOSES

THE ART, SCIENCE AND TECHNOLOGY

of audio engineering and applied acoustics is the particular concern of the British Sound Recording Association which, founded in 1936, is the recognised society for the promotion of knowledge in this field.

Open to amateur and professional alike, its members are kept informed of the latest technical and practical developments in all branches of electro-acoustical engineering by means of a comprehensive series of lecture-demonstrations by prominent authorities and by a quarterly journal.

Send the coupon below for membership application form.

PLEASE
COMPLETE
AND
POST
THIS COUPON

THE BRITISH SOUND RECORDING
ASSOCIATION

Greenways, 40 Fairfield Way,
EWELL, Surrey

Please send details of membership to

Name.....

Address.....

THE

The Stockholm String Orchestra play
THE BEST OF VICTOR HERBERT
... whose melodies and influence remain in the hearts of people
throughout the world.
Monaural only GGL 0016

The Hamburg Staatsoper Orchestra play
GRIEG'S PEER GYNT SUITES

The Peer Gynt Suites are probably the best known and best
loved works by Norway's leading composer.
Monaural GGL 0029 Stereophonic GSGL 10029

LATEST

GOLDEN

101 Strings play
SYMPHONY FOR LOVERS

These selections have an emotional depth which could only
come from the masters of the romantic period in music.
Monaural GGL 0039 Stereophonic GSGL 10039

101 Strings play
THE BLUES

In this tribute to W. C. Handy, '101 Strings' captures all the
heart and emotional qualities of some of the greatest blues
selections ever written.
Monaural GGL 0040 Stereophonic GSGL 10040

GUINEAS.

HEAR

The Left Bank Bearcats play
DIXIELAND

We feel that tunes and performances of this calibre will be
with us for a long time. After all, it is the good things that last.
Monaural only GGL 0041

101 Strings play
A BRIDAL BOUQUET

The ideal present for newly-weds.
Monaural GGL 0042 Stereophonic GSGL 10042

THEM

IN

101 Strings play in
THE QUIET HOURS

These are the sounds and moods of the Quiet Hours.
Monaural GGL 0044 Stereophonic GSGL 10044

101 Strings play
CONCERTO UNDER THE STARS

A beautifully arranged selection of concertos to recreate for
you 'a night under the stars'.
Monaural GGL 0045 Stereophonic GSGL 10045

ROOM

152.

The Light of Faith Choir sing
**HYMNS THE FAMILY KNOWS
AND LOVES**

A selection of well-known hymns sung and cherished the world
over.
Monaural GGL 0046 Stereophonic GSGL 10046

The Nord Deutsches Symphony Orchestra
TCHAIKOVSKY: Nutcracker Suite
BORODIN: Polovtsian Dances
MANUEL de FALLA: Ritual Fire Dance
Monaural only GGL 0047

PYE

GOLDEN

101 Strings
GRAND CANYON SUITE

The wonders of the sights and sounds of America were the
inspiration for Ferde Grofe's 'Grand Canyon' Suite.
Monaural GGL 0048 Stereophonic GSGL 10048

David Bee and his Society Orchestra
LET'S DANCE VOLUME II

Another of David Bee's wonderful LP's to add to your dance
music library.
Monaural only GGL 0049

GUINEAS*

* 12" LPs FOR ONLY 21/- EACH. STEREO 27/6.

THE TSL PROGRAMME

BOOTH No.	DEM. ROOM
48	247

TSL SERVE THE PUBLIC

Through TSL, hi-fi and tape enthusiasts have been enabled to buy some very fine items of equipment. It was TSL who first brought 4-track stereo tape recorders to Britain and who now offer a whole range of such instruments as well as such superb products as Thorens Transcription Units, Ortofon Pick-ups, Lorenz Speakers, etc. etc. These are all to be seen at our Audio Fair stand and room and purchased through your usual stockist. For those who cannot call, we shall be pleased to send full descriptive literature.

TSL SERVE THE TRADE

TSL is an organisation specialising in the importation, manufacture and development of fine tape-recorders, hi-fi equipment and accessories. The lines are available only to wholesale and retail houses and enjoy the distinction of being greatly in demand. Full trade discounts and wide coverage with publicity are offered. May we have your name for our mailing list?

TECHNICAL SUPPLIERS, LTD.

FIRST with 4-Track Stereo Recorders FIRST with the World's Finest Motors and Pick-ups

RECORDERS 4 TRACK STEREO/MONO, ETC.

HARTING HM8

4-track, 2-speed recorder (7½ and 3¾ i.p.s.) with two speakers (one in lid) for direct stereo replay. Overall response 30-20,000 c/s ±3dB. Heavy Engel Motor, Telefunken heads; pause, superimpose and monitor facilities, etc. **86 GNS.**

ELEKTRON 95/4K

4-track, single-speed recorder (3¾ i.p.s.) in small compact "airline" styled case. 2 15-ohm outlets; built-in speaker and dual amplifiers for record and playback. Pause, superimpose, monitor facilities, etc., etc. Response 30-16,000 c/s ±3dB. **77 GNS.** Squirrel-cage motor by Papst.

KÖRTING MK. 128

4-track, single-speed recorder (3¾ i.p.s.). Telefunken heads, built-in speaker for monitoring. Dual amplifiers for record and playback. Response 30-16,000 c/s ±3dB. 5 watts total output. Superimpose, pause, etc., etc. Heavy-duty A.E.G. **68 GNS.** motor. 7" reels.

TSL "VEDETTE"

Popularly - styled 2 - speed recorder (7½" x 3¾") ½-track type, 40-11,000 c/s. 9" x 5" built in speaker. External speaker connection. 2 standard jack-plug inputs. Superimpose, monitor, etc. **29½ GNS.**

MOTORS AND PICK-UPS

THORENS TD. 124 TRANSCRIPTION TURNTABLE

- 4 speeds variable within ±3%.
- two-part turntable with clutch drive; inner of iron weighs 11½lb; outer of aluminium.
- Exclusive eddy current brake.
- Rubber belt drive and special pulley and idler assembly completely eliminate vibration.
- Arm for 12" or 16" discs can be mounted as required.
- Built-in illuminated stroboscope; built in spirit level.
- Size 15½" x 12¾"; 3" below mounting board, 2½" above. **£40 . 17 . 0**
+£13 . 15 . 0 P.T.

ORTOFON PICK-UPS

- Type C mono head with diamond, **£13.0.0+£1.7.8 P.T.**
- Type SK212 mono arm, **£4.15.0+£1.12.0 P.T.**
- Type SCG Stereo head with diamond, **£24.0.0+£8.1.9 P.T.**
- Type SSM212 Stereo Arm, **£10.0.0+£3.7.4 P.T.**
- Matching Transformer 6631, each **£2.7.6** (No P.T.) (1.5 ohms primary; 20,000 ohms secondary).

PRE-RECORDED TAPES

Omega tapes and Concertapes for mono and stereo. Fine music, finely recorded Ask for the TSL List.

LOUDSPEAKERS

TSL-Lorenz speakers in chassis and wall-mounting corner units. Also TSL-Lorenz Tweeters and sub-miniature units for transistor powered equipment.

MICROPHONES

- TSL M.1. Dynamic **£4.4.0.**
- TSL S.2 Stereo Dynamic
Low Imp. 17 gns.
High/Low Imp. 19 gns.
- TSL MX3 Hi-Fi Quality Crystal with stand **45/-.**

OBTAINABLE FROM GOOD STOCKISTS EVERYWHERE

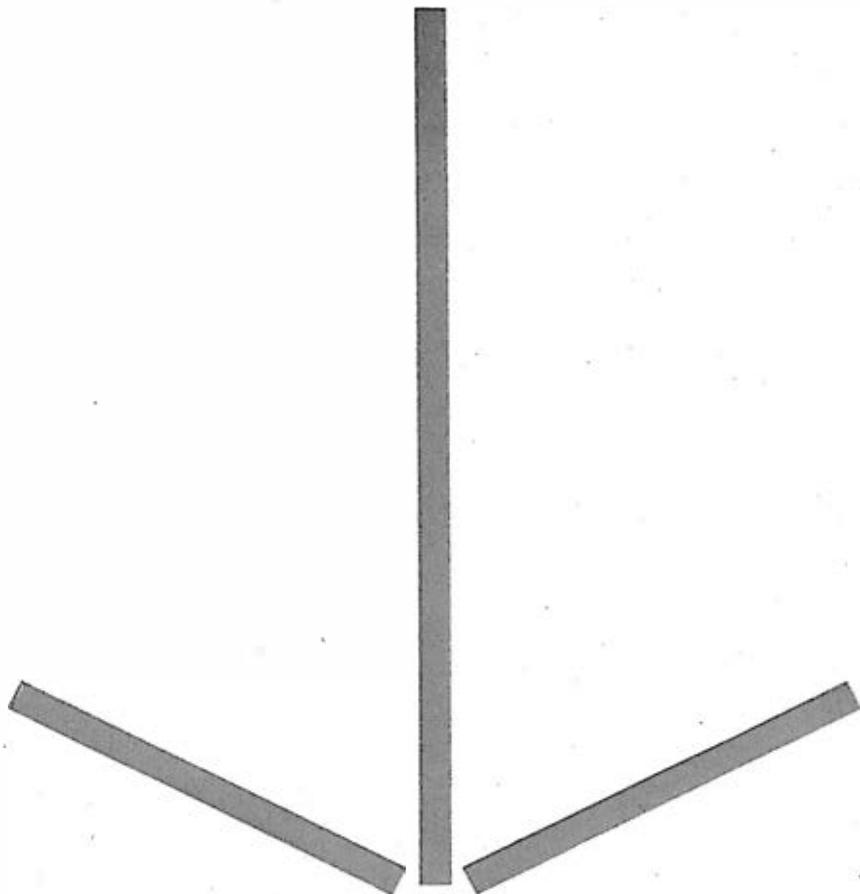
Full descriptive Literature available

HUDSON HOUSE, 63 GOLDHAWK RD., LONDON, W.12

Telephone: SHEpherds Bush 2581 and 4794

Telegrams: Home—Teknika London W.12

Overseas—Teknika London



SEE THE SUPERB RANGE OF
DESIGN
AUDIO EQUIPMENT CABINETS

ROOM No. 211

DESIGN FURNITURE LIMITED
CARNWATH ROAD, FULHAM ROAD,
LONDON, S.W.6
TELEPHONE : RENown 2217



Standard Telephones and Cables Limited

CONNAUGHT HOUSE, 63, ALDWYCH, LONDON, W.C. 2

Telephone HOLborn 8765

THE COMPLETE RANGE OF STC BROADCAST QUALITY MICROPHONES WILL BE EXHIBITED:—

The popular 4021 "BALL & BISCUIT" omni-directional moving coil studio microphone.

The 4032, a robust hand microphone, with built-in switch, as used by radio and television reporters, interviewers, etc.

The 4033 Cardioid which is a composite microphone having moving coil and ribbon elements that can be used separately or in combination.

The 4035 is a general purpose microphone for studio work or public address installations.

Both the long and short versions of the well-known 4037 "Pencil" microphone will be shown. These are ideal where an unobtrusive omni-directional instrument is needed, i.e., television interviewing, etc.

The 4038 is specially suitable for all types of musical work. It has an accurate "figure-of-eight" polar characteristic in both planes, a very smooth response extending to 15 Kc/s and an excellent transient response.

The 4104 noise cancelling commentator's lip ribbon microphone is essential to any outside broadcast where the highest quality and signal to noise ratio is required.

The 4105 is a moving coil cardioid microphone, particularly suitable for use in high quality sound reinforcement systems where a high degree of intelligibility and a good feedback margin are required.

The exhibits will include the newly developed "STANTEL" curved column loudspeaker which has been designed for use in high quality sound reinforcement systems.

A 15-watt audio amplifier will also be shown.

VALVES

The exhibit shows those types in the very wide Brimar range which are particularly designed for use in high quality sound reception and reproduction applications. Also shown are triple-crystal units on B7G bases for use in switch-tuned F.M. receivers, eliminating the need for A.F.C. systems. The rest of the conventional tuner stages are, of course, still required, and a wide selection of types suitable for these purposes is also shown.

On the audio side the ELL80 will be of special interest; this combines two output pentodes in a single miniature bulb and is capable of 8.5 watts output in Class AB push-pull for 8 volts drive. Thus, in combination with the 6BR8 triode pentode, as voltage amplifier and phase-splitter, a sensitive high quality amplifier could be made using only two valves. The application of a valve such as the ELL80 in the stereo field would obviously be of great advantage.

For more conventional amplifiers a wide range of other types is exhibited, including the 7D11, two of which in push-pull are capable of 50 watts output, and (as previously indicated) the 6BR8 triode-pentode, which can be used in various circuits (i.e., rumble filter, tone control, low pass filter, phase splitter, etc.) throughout the intermediate stages of the amplifier.

BOOTH 35 ● OFFICE 240

See **HMV**

STAND

No 56

DEMONSTRATION ROOM

342

**THE GRAMOPHONE COMPANY LTD
HAYES
MIDDX**

See **EMI**

STAND

No 59

DEMONSTRATION ROOM

313

**EMI SALES & SERVICE LTD
HAYES
MIDDX**



BRITISH MADE MICROPHONES

AND ANCILLARY EQUIPMENT

*consistently
specified for quality*

●
IN A RANGE OF
MODELS FOR ALL REQUIREMENTS

●
LUSTRAPHONE LIMITED

ST. GEORGES WORKS, REGENTS PARK RD., LONDON, N.W.1

Phone PRImrose 8844 ●

Grams—LUSTRAPHON NORWEST LONDON

Cables—LUSTRAPHON NORWEST

THE LUSTRAPHONE RANGE

This comprises a wide range of microphones, many developed for highly specialised purposes. Those detailed below will be found particularly useful for recording and studio work of all kinds. LUSTRAPHONE MICROPHONES are British in design, materials and manufacture. Whatever the model of your choice, when you buy LUSTRAPHONE you buy quality and reliability.

LD.66 — DYNAMIC

An entirely new modern style moving-coil microphone designed particularly for use with tape recorders. Response is substantially flat from 70 to 12,000 c/s. In Low, Line, High and Condenser impedances. Prices according to impedance and mounting from **£42.6**

LD.61 — "LUSTRETTE" DYNAMIC

Popularly priced microphone for stand or hand use. Makes the ideal replacement for crystal microphones. In all impedances. **67/6**

LFV.59 — "FULL VISION" DYNAMIC

Lustraphone's famous "Full Vision" microphone as used for TV, stage, film and other professional work. Face diam. only 1 3/16in. Available as a hand microphone or for stand mounting. In Low, Line or High impedances. **£8.18.6**

VR.64 — RIBBON VELOCITY

A robustly designed instrument of somewhat miniature proportions which greatly increases the uses of this type of microphone. The specially suspended ribbon is triple-blast screen protected. Response is substantially flat from 50 to 13,000 c/s. Complete on base with cable. Low, Line or High impedance. **£7.17.6**

VR.53 — STUDIO RIBBON VELOCITY

Bi-directional, high fidelity model for broadcast, recording and other professional requirements. Has a high level of sensitivity and extended frequency response. For stand mounting. Low, Line or High impedances. **£9.19.6**

VR.65 — "STEREOMIC" TWIN RIBBON

Twin ribbon assembly, vertically mounted with switching arrangements to permit use as a high fidelity stereophonic or monophonic microphone. A superlatively fine instrument. **30 gns.**

MICROPHONES FOR SPECIAL PURPOSES

These include noise-cancelling models, hand microtelephones, chest harness sets, miniature lapel microphones, inserts for telecommunications and intercom systems. Enquiries invited.

TRANSISTORISED MICROPHONE MIXER

MU/557

Four-channel unit for use with amplifiers and recorders having high impedance inputs. Two high and two low inputs to mixer. Power is supplied from a single miniature mercury cell having a working life of approx. 1,000 hours. Alternative input and output impedance values to specification.

STANDS, TRANSFORMERS, ETC.

A wide range of stands is offered, as well as matching transformers, and a variety of useful accessories.

TRANSISTOR AMPLIFIERS

This is a special LUSTRAPHONE development in which 10 and 15 watt fully transistorised amplifiers for PA are offered. Details on request.

BOOTH No.

24

**L
O
W
T
H
E
R**

NEW Designs

NEW Techniques

NEW Styling

★

all to be seen or heard:

STAND No. 64

ROOM No. 204

Office No. 239

★

all visitors are cordially invited

★

THE LOWTHER MANUFACTURING CO.

LOWTHER HOUSE, ST. MARK'S ROAD, BROMLEY, KENT

**FOR THE BEST IN
AUDIO EQUIPMENT**

WESTRADIO LTD.

24 ST. THOMAS ST.
BRISTOL 1

Tel: 92525
(3 lines)

17-21 PORTSWOOD RD.
SOUTHAMPTON

Tel: 55633
(2 lines)

**OFFICIAL
WHOLESALE
DISTRIBUTORS
FOR**

Garrard

EQUIPMENT

AS SHOWN AT

THE AUDIO FAIR

NOTICE TO TRADE VISITORS



**SPECIALIST
AUDIO
WHOLESALEERS**

LUGTON & CO LTD

209-212 TOTTENHAM COURT ROAD
LONDON W.1

IMMEDIATE SUPPLIES AVAILABLE OF RECORDS

DECCA — COLUMBIA — CAPITOL — R.C.A. —
PYE — ACE OF CLUBS — ETC.

HI-FI PRODUCTS

ACOUSTICAL — AVANTIC — DECCA — E.M.I. —
GARRARD — GOLDRING — GOODMAN'S —
ROGERS — SHURE — WHARFEDALE — ETC.

TAPE PRODUCTS

GRUNDIG — TELEFUNKEN — E.A.R. — E.M.I. —
E.T.C.

**TAPES All the best makes, including
COLUMBIA PRE-RECORDED TAPES**

Telegrams :
Maxitone, Rath
London

Telephone :
MUSEum 3261/7
P.B.X.

E.A. Wood — Ltd

THE HI-FI DISTRIBUTORS FOR THE MIDLANDS

Amplifiers • Loudspeaker Systems
Microphones • Pick-ups and Styli
Stereophonic Equipment • F.M. Tuners
Reproducers • Transcription Units

BEAM-ECHO • CAPITOL (EMI)
COSMOCORD • DECCA
GOODMANS • GARRARD
GOLDRING • GRUNDIG
GRAMPIAN • LEAK • QUAD
SIMON • TELEFUNKEN • TRIX
W.B. • WHARFEDALE

STEREO RECORDS
— by —
Decca • EMI • Pye-Nixa

EMI 'Stereosonic' Tapes

Demonstrations in our showrooms arranged through your dealer

100 ASTON ROAD, BIRMINGHAM 6

'Phone **ASTON CROSS 2951-8**

LEICESTER 'ELTIC HOUSE, 61 Belgrave Gate

'Phone **Leicester 58178**

Gramophone Record Dept. **7 FREEMAN STREET, BIRMINGHAM 5**

'Phone **Midland 6528-9**

1853—ESTABLISHED OVER 100 YEARS—1960

5 sound reasons for choosing from the TAPE RECORDER CENTRE



NO-INTEREST TERMS

on all orders over £30



FREE ILLUSTRATED 72-PAGE CATALOGUE

the most detailed publication of its kind



HUGE STOCKS OF ALL MAKES

ensuring quick delivery to all parts of the country



HONEST, INFORMED ADVICE

from enthusiastic tape-recording and Hi-Fi specialists



COMPREHENSIVE MAINTENANCE SERVICE

and inexpensive maintenance contract if desired



All makes of
Tape Recorders,
Hi-Fi Equipment,
Microphones, Speakers,
Accessories of all kinds,
Tapes

You can choose with confidence from
the leading Specialists.
Call, write or phone

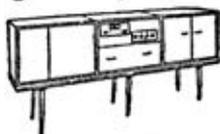
THE TAPE RECORDER CENTRE

THE TAPE RECORDER CENTRE LTD.,
Dept. AF, 75 Grand Parade, Green Lanes, Harringay, London, N.4. STA 1146

for the finest

HI-FI

equipment available



In this luxurious showroom you can relax, listen and compare all that is best in Hi-Fi. We built this special comparator in our own workshops, to enable you to hear innumerable combinations of amplifiers, loudspeakers, tuners, gramophone pick-ups and tape recorders—all by a flick of a switch! Now you can really compare the latest in both monaural and stereophonic equipment. Another equally spacious showroom displays a wide range of cabinets, from Period style to contemporary.

Whether you are an expert or making your first enquiry, our technical staff will find it a pleasure to help you.

LARGS

of Holborn for High Fidelity

76-77, HIGH HOLBORN, LONDON, W.C.1
Telephone: CHAncery 2626 (Private Branch Exchange)
Near Holborn Tube Stn. Buses 7, 8, 22, 23, 25 pass the door

... you will find all the

BEST IN **HI-FI**

IN

OUR

1960

FULLY ILLUSTRATED

HI-FI

CATALOGUE

6d. Post Free

BERRY'S
RADIO

25 HIGH HOLBORN
LONDON, W.C.1

(Opposite Chancery Lane)

Telephones: **HOLborn 6231-2**

BEING pioneers in the Electronic Industry,
we have always been concerned with faithful
sound reproduction.

Over 40 years practical experience makes
it rather easier for us to keep right in the
forefront with the latest and best in

HI-FI

and STEREO



PAYNE & HORNSBY LTD.

3 Andrews House, Gallowgate

NEWCASTLE UPON TYNE 1

Telephone: NEWCASTLE 2-4604



Northern Distributors for

**ARMSTRONG HI-FI STEREO CHASSIS and AMPLIFIERS.
EDDYSTONE, RECORD HOUSING, REFLECTOGRAPH
TAPE RECORDERS**

Stockists

**GRUNDIG, PYE, PHILIPS, Lenco, QUAD, LEAK,
G.E.C., EKCO, B.T.H., GARRARD, etc.**

When it comes to Hi-fi



*It's ME for
Modern Electrics
every time*

**A WORLD-WIDE PERSONAL
SERVICE IN HI-FI**
*FOR TAPE
DISC AND RADIO*

Large up-to-date stocks to choose from, prompt attention to all enquiries, despatch service to all parts of the world—these are the features that have won for Modern Electrics world-wide recognition wherever equipment for tape, disc or radio reproduction is wanted. It costs no more to go to Modern Electrics, and you will certainly enjoy the service they give you.

ACOS
AVANTIC
BRENELL
CHAPMAN
COLLARO
CONNOISSEUR
C.Q.
DECCA
DULCI
FERROGRAPH
FI-CORD
FILM INDUSTRIES
GARRARD
GOODMANS
GOLDRING

GRUNDIG
JASON
KELLY
LEAK
LENCO
LUSTRAPHONE
ORTOFON
PAMPHONIC
PILOT
PHILIPS
QUAD
REFLECTOGRAPH
RESLO
ROGERS
RONETTE

SIMON
STEELMAN
STUZZI
TANNOY
THORENS
TRUVOX
VITAVOX
VORTEXION
W.B.
WEARITE
WHARFEDALE

TAPES IN ALL SIZES BY
LEADING MAKERS

MODERN ELECTRICS, (RETAIL) LTD.

164 CHARING CROSS ROAD, LONDON, W.C.2

(3 shops from Tottenham Court Road Station Underground)

Telephone: TEM 7587 & COV 1703 Cables: MODCHAREX, LONDON

NORTH LONDON'S HI-FI CENTRE

for the

best selection of

AMPLIFIERS TUNERS
MOTORS SPEAKERS
CABINETS PICK-UPS
TAPE RECORDERS

CASH or TERMS

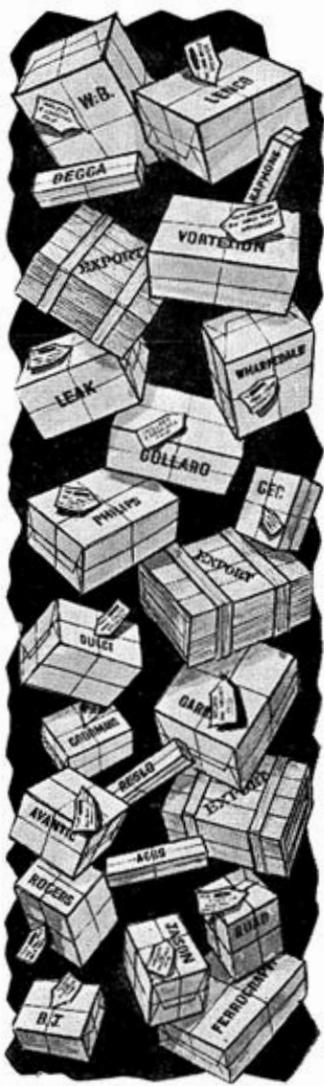
MAIL ORDER SPECIALISTS

GOODS DESPATCHED BY RETURN
CARRIAGE, PACKING **FREE!**
AND INSURANCE (U.K.)

WORLD WIDE EXPORTERS

OVERSEAS ORDERS SENT FREE OF
PURCHASE TAX AND SHIPPED PROMPTLY
AT MINIMUM COST

*We export Hi-Fi Equipment to all
parts of the Globe. Enquiries welcomed.*



C.C. GOODWIN (SALES) LTD

7 THE BROADWAY, WOOD GREEN, N.22

Telephone: BOWes Park 0077/8

Hours: 9—6 p.m. Monday to Saturday.
9—1 p.m. Thursday.

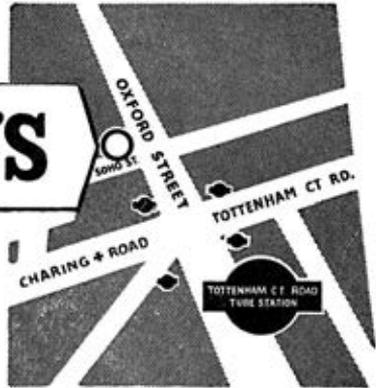
Callers Note: We are 200 yards from
Wood Green Underground Station.

Choose them in comfort . . . Hear them at leisure !

How to get there. From Tottenham Court Road Tube Station go westward along Oxford Street. Soho Street is the first on the left.

Make your way

to



You'll find everybody at Webb's to be cheerful and helpful—without any high-pressure sales talk. We have one of the largest selections of the best in hi-fi equipment in London. Come and compare the merits of any combination of Amplifier, Speaker, Pick-up and Radio, in comfort and at your leisure.

● **AMPLIFIERS** by

ACOUSTICAL	ARMSTRONG
ROGERS	LEAK
B.T.H.	R.C.A.

● **SPEAKERS** by

GOODMANS	SOUND SALES
VITAVOX	ROLA
TANNOY	CELESTION
WHARFEDALE	W.B.

● **F.M. & A.M. RADIO UNITS** by

ACOUSTICAL	CHAPMAN
ARMSTRONG	JASON

● **PICKUPS & MOTORS** by

COLLARO	CONNOISSEUR
TANNOY	LEAK
GARRARD	EXPERT



Webb's unrivalled stocks cover everything from a replacement stylus to complete de luxe outfits. Attractive Hire Purchase terms available.

14 SOHO STREET, OXFORD STREET, LONDON, W.1.

Telephone: GERrard 2089 and 7803

Shop hours: 9 a.m. to 5.30 p.m. (7 p.m. Thursday), 9 a.m. to 1 p.m. Saturdays.

INTEREST FREE TERMS

at **TELESONIC LTD**

The National Mail Order Specialists for all the best in Hi-Fi Equipment, Tape Recorders and Classical Records.

AVAILABLE FROM STOCK

Quad, Leak, Rogers, Armstrong, Jason, Decca, Garrard, Philips, Connoisseur, Tannoy, Wharfedale, W.B., Simon, Goodmans, Goldring-Lenco, Grundig, Vortexion, Elizabethan, R.G.D., Telefunken, Stuzzi, Harting, Fi-cord, S.M.E., etc., etc.

ON OUR FAMOUS £1 DEPOSIT TERMS

See our monthly advertisements in "Gramophone," "Hi-Fi News" and "Gramophone Record Review," giving detailed terms of a selection of Hi-Fi Equipment.

TELESONIC LTD

153, TOTTENHAM COURT ROAD

(adjoining Odeon Cinema)

LONDON, W.1. EUSton 2221



Full range of Tape and Accessories available, also a SPECIALIST REPAIR SERVICE for Hi-Fi Equipment, Tape Recorders, F.M. Tuners, etc.

Your enquiries welcomed.



**come and hear your choice
of hi fi at Imhofs**

See and hear a wide range of systems. Hear stereo: listen in comfort to all the latest amplifiers, tuners, tape decks, motors and loudspeakers. Comparison of instruments is easy—the Imhof Comparator enables you to listen to over 4,000 combinations of instruments at the flick of a switch. Imhofs hold, too, most comprehensive stocks of records and pre-recorded tapes, backed by a 'Round-the-World' Postal Service second to none! There's seven floors at Imhofs devoted to the interests of the music lover, from hi fi to accessories. Call in at Imhofs and enjoy yourself!

IMHOFS

**Hi Fi
Recitals**

are held at Imhof House on Thursdays at 7.30 p.m. Admission is FREE but accommodation is, of course, limited. So write or call in for your tickets NOW!

To: Alfred Imhof Ltd. Dept. AFC, 112-116 New Oxford St. WC1 Museum 7878

*Please send me a free copy of
'This Year of Hi Fi 1960'*

NAME

ADDRESS

..... AFC

AUDIO ACCESSORIES



by

for your TAPE RECORDER

as used and recommended by ALL THE LEADING TAPE RECORDER MANUFACTURERS



KLENZATAPE

Faulty recording, distortion and noisy playback, incomplete erasure and numerous other faults are often due to oxide and dirt deposits from the tape on the Record and Erase Heads of Tape Recorders. METRO-SOUND proudly presents KLENZATAPE, a new and scientific device designed to clean these inaccessible surfaces as easily as playing 12 ft. of normal tape.

Price 12/6d. per kit.

METRO-TABS

For immediate identification of recorded passages. Colourful acetate tabs, under .002 in. thin—2 sets each of 10 pairs, different colour coding, 20 pairs in all. Dimension of tabs ensures that opposite track recordings may be made or played without interference. Tabs supplied in the most comprehensive Index devised. Clearly visible on a fully wound spool. Upper and Lower tracks indicated separately. Price 3/11d. Complete set with Index.



As Britain's foremost Manufacturers of Audio Accessories, METRO-SOUND also help you to get the best results from your Record Players and Transcription Units whether, Hi-Fi, Stereo or just plain ordinary Monaural, when you use the

METRO-SOUND

Masterpoint Range of Diamond and Sapphire Replacement Styli each with its own Nylon Cleaning Brush.
The World famous **STYLOMETER** for a positive check on Stylus Playings.
Anti-Static Record Cleaning Fluid
Record Cleaning Pads
45 r.p.m. NonSlip Adaptors

METRO-SOUND AUDIO ACCESSORIES

—ALL THE BETTER TO HEAR WITH

For descriptive leaflets write to:—

The METRO-SOUND MFG. CO. LTD., 19a Buckingham Rd., London, N. 1

(Tel.: CLISSOLD 8506/7)

DIRECTORY OF

LONDON POSTAL DISTRICT

Telephone: HOL 6231-2

BERRY'S (SHORT WAVE) LTD.

25, HIGH HOLBORN, W.C.1

FOR THE BEST IN HI-FI EQUIPMENT,

SIDE-BY-SIDE DEMONSTRATIONS

See advertisement page 106

Telephone: PAL 5228

CUSTOM HIGH FIDELITY

371, GREEN LANES, PALMERS GREEN, N.13

Quad, Leak, Rogers, Avantic, Pamphonic, Jason, Wharfedale, Goodmans, Decca, Garrard, Connoisseur, Simon, Reflectograph, Ferrograph. All High Fidelity and Tape Recording Services available.

Telephone: BOW 0077-8

C. C. GOODWIN (SALES) LTD.

7, THE BROADWAY, WOOD GREEN, N.22

ALL GOOD MAKES OF EQUIPMENT. AMPLIFIERS, SPEAKERS, MOTORS, TUNERS, PICK-UPS, TAPE RECORDERS, CABINETS

See advertisement page 109

Telephone: MUS 7878

ALFRED IMHOF LTD.

112-116, NEW OXFORD STREET, W.1

Every worthwhile development in Sound Reproduction on permanent demonstration. Safe, swift delivery to any address in the world.

See advertisement page 112

Telephone: CHA 2626

LARG & SON (LONDON) LTD.

76-77, HIGH HOLBORN, W.C.1

FULL RANGE OF HI-FI EQUIPMENT, BOTH STEREO AND SINGLE-CHANNEL. Comprehensive demonstration facilities with specially designed Comparator.

See advertisement page 165

Telephones: COV 1703 ; TEM 7587

MODERN ELECTRICS (RETAIL) LTD.

164, CHARING CROSS ROAD, W.C.2

QUAD, LEAK, WHARFEDALE, GOODMAN'S, GARRARD, Lenco, CONNOISSEUR, FERROGRAPH, VORTEXION, GRUNDIG, SIMON, etc.

See advertisement page 108

AUDIO DEALERS

Telephone: STA 1146

THE TAPE RECORDER CENTRE LTD.

75, GRAND PARADE, N.4

Grundig, Elizabethan, Ferrograph, Vortexion, Walter, Brenell, Reflectograph, Simon, Harting, Telefunken, Spectone, Veritone, Stuzzi, Fi-Cord, Truvox, Elektron, Minivox, etc. All makes Hi-Fi equipment.

See advertisement page 104

Telephone: GER 2089

WEBBS RADIO

14, SOHO STREET, OXFORD STREET, W.1

EXPERT ATTENTION ON ALL HI-FI MATTERS. EXPORT ARRANGEMENTS A SPECIALITY BY SEA, AIR OR PERSONAL EXPORT

See advertisement page 110

BOLTON

Telephone: BOLTON 6247

HARKER & HOWARTH,

7, THE ARCADE, BRADSHAWGATE

Quad, Leak, Rogers, Avantic, Pamphonic, Armstrong, Connoisseur, Chapman, Tannoy, Wharfedale, Goodman, W.B., Record Housing, Design Furniture, Ferrograph, Simon, Reflectograph

BOURNEMOUTH

Telephone: BOURNEMOUTH 25232

NATIONAL RADIO SUPPLIES,

66, HOLDENHURST ROAD

STEREO and MONO AMPLIFIERS, TUNERS, SPEAKERS, GRAMOPHONE and TAPE. Comprehensive range of all current components.

CAMBRIDGE

Telephone: CAMBRIDGE 59349

G. P. REECE,

1 and 2, PEAS HILL

FOR ALL YOUR HIGH FIDELITY REQUIREMENTS

CANTERBURY

Telephone: CANTERBURY 4034

GOULDENS,

36, HIGH STREET

QUAD, LEAK, ROGERS, GARRARD, CONNOISSEUR, TANNOY, GOODMAN'S, WHARFEDALE, W.B.

DIRECTORY OF

CARDIFF

Telephone: CARDIFF 28473

GOUGHS (F. Gough & Co. Ltd.)

148-154, NORTH ROAD

QUAD and LEAK Main Dealers. Largest range of High Fidelity Equipment in Wales. Mono and Stereo test facilities on our "Comparisound" unit.

DORKING

Telephone: DORKING 4229

HIGH FIDELITY CENTRE

61, WEST STREET, SURREY

Record Browserie. Tape Recorders by Grundig, Telefunken, Brenell, Spectone, etc. All makes Hi-Fi Amplifiers, Speakers, Enclosures, Tuners, Transcription Motors, etc. Own Cabinet Works.

EDINBURGH

Telephone: FOU 8389

JEFFREYS (Geo. Jeffrey Ltd.)

23, EARL GREY STREET, 3

Tape Recorders and High Fidelity Equipment. Ferrograph. Simon, Grundig, Spectone, Quad, Leak, Dynatron, Decca, etc. Private Recording Service. Tape to Disc Service.

EXETER

Telephone: EXETER 74161/62

FILDEWS,

99, FORE STREET

Quad, Leak, Pye, Ferrograph, Tannoy, Wharfedale, Chapman, Decca, Garrard, Avantic, Dynatron, Lowther, Goodmans, Reflectograph, Fi-Cord. Service and Sales throughout Devon, West Somerset and West Dorset.

HALIFAX

Telephone: HALIFAX 66832

TREVOR FAWTHROP LTD.,

17, RAWSON STREET

SERVICE AGENTS FOR TELEFUNKEN. AGENTS FOR ALL THE LEADING TAPE RECORDERS AND AMPLIFIERS.

KEIGHLEY

Telephone: YORKSHIRE 3855

J. S. RAMSBOTTOM & CO. LTD.,

WE HAVE THE LARGEST STOCK OF HI-FI AND TAPE RECORDING EQUIPMENT IN THE NORTH OF ENGLAND.

Demonstrations arranged in your own home. All the leading makes.

COOK LANE, KEIGHLEY, YORKSHIRE

AUDIO DEALERS

KIDDERMINSTER

Telephone: KIDDERMINSTER 2519

F. W. LONG (Sound Specialist), "RADIO HOUSE," 14, MILL STREET

Individual demonstrations, personal attention. Leak, Acoustical, Rogers, Armstrong, Jason, Quad, Lowther, Goodmans, Wharfedale. Garrard, Decca, Ferrograph, Reflectograph, Simon, Fi-Cord.

KINGSTON-UPON-THAMES

Telephone: KIN 5549

SURBITON PARK RADIO, 48, SURBITON ROAD, SURREY

Tannoy, Wearite, Ferrograph, Audiomaster, Leak, Goodmans, Wharfedale, W.B., Record Housing, Garrard. Large range of components for the Home Constructor.

LEAMINGTON SPA

Telephone: LEAMINGTON SPA 35

TYSONS SOUND ENGINEERS, 41, RUSSELL STREET, WARWICKS.

AVANTIC, CONNOISSEUR, DECCA, GARRARD, GOODMAN'S, GRUNDIG, LEAK, Lenco, ROGERS, TELEFUNKEN, etc., and 16 mm. Sound Projectors backed by A1 service.

LEATHERHEAD

Telephone: LEATHERHEAD 2214

MAURICE RICHARDS LTD., RADIO HOUSE, THE CRESCENT, SURREY.

QUAD, LEAK, PYE, TANNOY, WHARFEDALE, GOODMAN'S, ROGERS, DECCA, GARRARD. Comparator demonstrations by appointment. Personal attention.

LEICESTER

Telephone: LEICESTER 20431

LEICESTER CO-OPERATIVE SOC. LTD., RADIO DEPT., HIGH STREET.

Leak, Quad, Tannoy, E.M.I., Rogers, Avantic, Ferrograph, Wharfedale, W.B., Lowther, Simon, Brenell, Audiomaster, Pamphonic. Comparator Audio Room. Design and Record Housing cabinets.

LEIGH

Telephone: LEIGH 73151/2

JOHN SHINN & SONS LTD., TOWN CENTRE, LANCS.

Official Agents for Simon, Grundig, Reflectograph, Ferrograph, etc. All popular recorders stocked. TWELVE YEARS' EXPERIENCE IN TAPE RECORDER SERVICING. Branches at: Wigan, Culcheth, Bangor.

DIRECTORY OF

LUTON

Telephone: LUTON 7388/9

COVENTRY RADIO LTD.,

189/191, DUNSTABLE ROAD.

SPECIALISTS IN AUDIO EQUIPMENT AND RADIO COMPONENTS.

Established 1925.

MACCLESFIELD

Telephone: MACCLESFIELD 2900

HI FI HOUSE,

123, CHESTERGATE.

High Grade sound recording and reproducing equipment and accessories, including products by: Simon, Grundig, Telefunken, Dynatron, Leak, Acoustical, Garrard, Avantic, Wharfedale, Goodmans. Comparative demonstrations.

MAIDSTONE

Telephone: MAIDSTONE 56064

HIGH FIDELITY (Maidstone) LTD.,

57, KING STREET.

Audiomaster, Armstrong, Beam-Echo, Jason, Leak, Quad, Tannoy, Lowther, Goodmans, Wharfedale, Reflectograph, Brenell, Grundig, Ferrograph, Garrard, Connoisseur, etc.

MANCHESTER

Telephone: DEANSGATE 3825

HIGH FIDELITY DEVELOPMENTS LTD.,

8, DEANSGATE (Next to Grosvenor Hotel).

ACOUSTICAL, ARMSTRONG, AVANTIC, BRENELL, CHAPMAN, JASON, LEAK, LOWTHER, PYE, ROGERS, REFLECTOGRAPH, FERROGRAPH, H.M.V., GOODMAN'S, WHARFEDALE, etc.

MITCHAM

Telephone: MITCHAM 3282

HOME RADIO (Mitcham) LTD.,

187, LONDON ROAD.

Leak, Pye, Armstrong, Quad, Rogers, Jason, Garrard, Lenco, Goodmans, Wharfedale, W.B. Stentorian, W.B. and Record Housing Cabinets, Grundig, Simon, Brenell.

NEWCASTLE-UPON-TYNE

Telephone: NEWCASTLE 2-4604

PAYNE & HORNSBY LTD.,

3, ST. ANDREWS HOUSE, GALLOWGATE, 1.

REFLECTOGRAPH, GRUNDIG, PYE, G.E.C., EKCO, ARMSTRONG, LEAK, QUAD, Lenco, GOLDRING, GARRARD, Record Housing, etc.

See advertisement page 107

AUDIO DEALERS

READING

Telephone: READING 54038

HICKIES, 153, FRIAR STREET.

All Dynatron, Quad, Leak, H.M.V. Emisonic, Pye, Wharfedale, Armstrong, Garrard, Radio Tuners, Amplifiers, Cabinet Loudspeakers, Motors, Pick-ups, on instant demonstration in specially equipped showroom.

SLOUGH

Telephone: SLOUGH 25073

HICKIES, 67-69, HIGH STREET.

All Dynatron, Quad, Leak, H.M.V. Emisonic, Pye, Wharfedale, Armstrong, Garrard, Radio Tuners, Amplifiers, Cabinet Loudspeakers, Motors, Pick-ups, on instant demonstration in specially equipped showroom.

SOUTHAMPTON

12, BARGATE STREET.

Telephone: SOUTHAMPTON 28547

FOR ALL YOUR HI-FI REQUIREMENTS

UNIVERSITY CAMERAS, OF SOUTHAMPTON.

THORNTON HEATH

Telephone: THORNTON HEATH 7603

NUSOUND RECORDING COMPANY,

(1st Floor), 3-8, BRIGSTOCK PARADE, LONDON ROAD.

LONDON AREA (Tape Recorders—Hi-Fi). STOCKING AGENTS: Ferrograph, Vortexion, Simon, E.M.I., H.M.V., Leak, Quad, Rogers, Armstrong, Jason, Goodmans, Wharfedale, etc.

TUNBRIDGE WELLS

Telephone: TUNBRIDGE WELLS 2673

GOULDEN & CURRY LTD., 59, 61, 66, HIGH STREET.

Amplifiers, Tuners, Loudspeakers and Pick-ups by Acoustical, Leak, Rogers, Wharfedale, Goodmans, Tannoy, Decca. Tape Recorders by Reflectograph, Grundig, Telefunken, Fi-Cord.

WORTHING

Telephone: WORTHING 5142

BOWERS & WILKINS LTD., BECKETT BUILDINGS, LITTLEHAMPTON ROAD.

Quad, Leak, Tannoy, Ferrograph, Wharfedale, Rogers, Connoisseur, Goodman, Telefunken, Pamphonic, Dynatron, Decca with fully comparative demonstrations.

INDEX OF ADVERTISERS

	<i>Page</i>		<i>Page</i>
ACOS	78	LOWTHER	100
ACOUSTICAL	44/45	LUGTON	102
AKG	74/75	LUSTRAPHONE	98/99
AMATEUR TAPE RECORDING	60	METROSOUND	113
AMPEX (CALIFORNIA)	86/87	MINIVOX	59
AMPEX (DOMESTIC)	36/37	MODERN ELECTRICS	108
AMPEX (PROFESSIONAL)	35	MULLARD	46
AUDIOMASTER	54	M.S.S.	32
BASF	38/39	PAMPHONIC	85
BBC	16	PAYNE AND HORNSBY	107
BERRYS	106	PYE RECORDS	91
BRENELL	51	REFLECTOGRAPH	<i>Inside cover</i>
BSRA	90	RESLO	81
BUTOBA	56	ROGERS	49
CELESTION	89	ROMAGNA	88
CHAPMAN	64	REPRODUCERS	
CHITNIS	66/67	SCOTCH BRAND	<i>Inside cover</i>
CONNOISSEUR	8	SHURE	40
DESIGN FURNITURE	94	SPECTONE	82/83
ELIZABETHAN	57	STC	69 & 95
E.M.I. SALES AND SERVICE	50	STEELMAN	52
E-R	58	TANNOY	62/63
FI-CORD	72	TAPE RECORDER CENTRE	104
GARRARD	80	TELEFUNKEN	76
G.E.C.	73	TELESONIC	111
GOLDRING	84	TEPPAZ	14/15
GOODMANS	70/71	TRIX	61
C. C. GOODWIN	109	TRUVOX	68
THE GRAMOPHONE	22	TSL	92/93
GRAMPIAN	53	VORTEXION	79
HMV	96/97	WALTER	55
IMHOFS	112	WEBBS RADIO	110
IRISH BRAND	65	WESTRADIO	101
LARGS	105	WHARFEDALE	31
LEAK	27	W. B. STENTORIAN	77
		WOOD E. A.	103



New

REFLECTOGRAPH

MODEL A Professional-Type Tape Recorder

The new Model A tape recorder is precision engineered for utmost reliability. Years of experience in the manufacture of tape recorders are behind this machine.

TAPE DECK

- ★ Utmost reliability—no rubber pulleys to wear.
- ★ Instant stop and start. Single knob electrical variable speed wind—1,200 feet wound in 45 seconds. Capacity for up to 8½" reels.
- ★ Heavy duty, direct drive, synchronous motor, 2 special Garrard reel motors.
- ★ Auto stop, 2 speeds 7½ and 3½ i.p.s. Precision tape indicator.

Patent application No. 1109/60. Registered Design Application 895860. World patents pending.

AMPLIFIER

- ★ Tape/input switch for direct comparison between input and recorded signals.
- ★ Frequency response (7½ i.p.s.): ±2 dB from 40-10,000 c/s (Equalised to CCIR standards).
- ★ Signal to noise ratio: —50 dB approx. (un-weighted including hum).
- ★ Inputs: microphone and radio.
- ★ Outputs: head pre-amplifier and external speaker (15 ohms).
- ★ Calibrated record level meter.

Price, with half track erase, record and play-back heads, one way operation and self-contained 3 watt amplifier

95 GNS.

See and hear it at your Multimusic dealer

Multimusic Limited

Maylands Avenue, Hemel Hempstead, Herts. Tel: Boxmoor 3636

