

hi-fi news & record review

JULY 1977 35p

LOUDSPEAKER
SUPPLEMENT
11 latest models examined

Whose copyright
on record?

New amplifier
tests proposed



9 out of 10 people who read this ad shouldn't buy this speaker

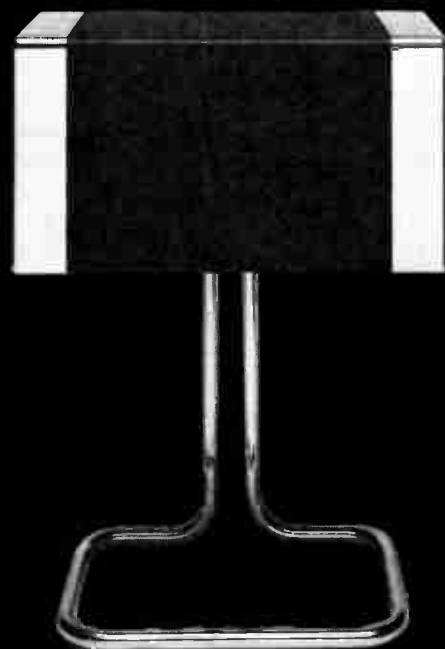
If you own a receiver or amplifier of less than 40 watts per channel the Gale 401 loudspeaker is not for you!

If your system is just for background music to create a pleasant atmosphere, not for serious listening, the Gale 401 loudspeaker is not for you!

However, if you demand the best from your audio equipment

. . . insist on hearing everything that's on the record or tape you're playing
. . . insist on having your sound without distortion when it's very loud or very soft
. . . insist on a speaker system capable of safely handling 200 watts . . .

Then consider the Gale 401 loudspeaker.



Gale

Gale Electronics Limited 23 Bruton Place London W1X 7AB

CONTENTS

Hi-Fi News & Record Review July 1977 Volume 22 No. 7

REGULARS

- 3 COVER PICTURE DETAILS
- 21 EDITORIAL COMMENT
- 23 NEWS & VIEWS from the world of sound
- 65 CROSSWORD PUZZLE devised by Maurice Taggart
- 139 READERS' PROBLEMS examined by 'Crossover'
- 85 READERS' LETTERS
- 135 POSITIVE FEEDBACK—technical correspondence from Quad, Decca and BASF on various contentious matters
- 33 SOUNDINGS by Donald Aldous
- 67 SUBJECTIVE SOUNDS by Paul Messenger
- 69 FM RADIO by Angus McKenzie
- 31 BOOK REVIEWS by Paul Messenger, Donald Aldous, Christopher Breunig, Peter Gammond
- 27 AUDIO PATENTS by Adrian Hope
- 87 TAPE MATTERS by Douglas Brown
- 97 GRAMOPHILE—the record and music scene
- 101 LOOKING BACK by Peter Gammond
- 101 THE THINGS I HEAR by Arthur Jacobs
- 89 MUSIC ON RECORD: Rachmaninov's orchestral music
- 21 SUBSCRIPTION DETAILS
- 168 CLASSIFIED ADVERTISEMENTS
- 132 DEALER PANEL ADVERTISEMENTS
- 170 ADVERTISERS' INDEX



Our photographer takes a peek through the already near-transparent grille of Wharfedale's E.70 loud-speaker, one of the eleven models reviewed in this issue.

COVER PICTURE

No, we don't regard modern loudspeakers as a load of old monoliths, but those famous 'hanging stones' on Salisbury Plain have just the air of permanence adopted by speakers in any self-respecting hi-fi lounge. Ten of the models reviewed in this issue were trundled down to Wiltshire for this photograph (with apologies to Celef, who just missed the chariot with their Mini-Pro SM), but we must explain that the whole idea was well in hand before we came across Mission's colour brochure on the Stonehenge theme. Despite presence of their Model 710 in the review, this was a pure coincidence.

FEATURES

- 35 *Loudspeaker Supplement*
 - 36 **ELEVEN SPEAKERS—THE GRAPHS**
Measured curves and other data on models detailed below under 'Equipment Reviews'
 - 41 **ELEVEN SPEAKERS—THE MEASUREMENTS**
James Moir describes equipment and techniques employed in the review
 - 45 **ELEVEN SPEAKERS—THE LISTENING TESTS**
Paul Messenger discusses problems and parameters in arriving at team judgements of performance
 - 47 **ELEVEN SPEAKERS—THE FINDINGS**
Potted summaries of the listening team's impressions and other points
 - 51 **LOUDSPEAKER DISTORTIONS—Can We Hear Them?**
A separate article by Peter Fryer describing an independent attempt to match measurements and judgements
-
- 29 **RECORD PLAYER ROUNDUP**
Martin Colloms summarises the results of a comprehensive survey
 - 59 **RECORD PIRACY**
Adrian Hope looks at prevention, detection and deterrence
 - 71 **AMPLIFIERS: Measuring What We Can Hear**
Some new ideas and techniques for correlating objective measurements and subjective impressions, by Gordon King
 - 81 **QUALITY MONITOR**
Recent starred recordings re-examined for sound
 - 89 **RACHMANINOV'S ORCHESTRAL MUSIC**
Andrew Keener examines the discography
 - 95 **RECORDED BALANCE**
As a postscript to his Cassette-v-Disc articles, Angus McKenzie discusses aspects of musical balance in recordings

EQUIPMENT REVIEWS

- 36 **ELEVEN RECENT LOUDSPEAKERS: Celef Mini-Pro SM, Celestion Ditton 22, Exposure II, Harbeth, Keesonic Kub, Kef Calinda, Mission 710, Monitor Audio MA4, Rogers Compact Monitor, Tannoy Berkeley, Wharfedale E70**
Composite review by Donald Aldous, John Atkinson, Trevor Attewell, John Crabbe, Tony Faulkner and Paul Messenger

RECORD REVIEWS

- 104 **RECORDS OF THE MONTH**
- 103 **CLASSICAL ISSUES** (full index overleaf)
- 125 **DEJA VU**—classical reissues (details overleaf)
- 127 **CLASSICAL CASSETTES** by Peter Gammond
- 129 **ROCK** by Fred Dellar
- 131 **FOLK** by Paul Oliver
- 133 **LIGHT** by Peter Gammond
- 133 **JAZZ** by Ken Hyder

Britain's largest circulation journal devoted equally to records and hi-fi, with an audited average net sale of 52,495 copies per issue at the last count (January–December 1976).
Technical articles of full page length or over appearing in *Hi-Fi News & Record Review* are detailed in the British Technology Index.




Classical Record Index

John Atkinson, Trevor Attewell, Peter Branscombe, Christopher Breunig, John Crabbe, Stephen Daw, Kenneth Dommett, Colin Evans, Iain Fenlon, John Freestone, Peter Gammond, Christopher Grier, Arthur Jacobs, Geoff Jeanes, Peter le Huray, Victor McAloon, Hugh Ottaway, Benedict Sarnaker, Humphrey Searle, Isla Tait, Leon Thompson, Peter Turner, B. J. Webb

- | | | | |
|---|---|---|--|
| J. S. BACH | DVORAK | MASSENET | TELEMANN |
| 104 Violin concertos (Szeryng/
Hasson) | 111 Symphony 9 (Horenstein) | 115 Songs (Tourangeau) | 123 Recorder sonatas (Concentus
Musicus of Denmark) |
| 104 Trio sonatas / etc (Benbow) | 112 String quartet in F (Panocha Qt) | OFFENBACH | TOMASEK |
| 104 Cello suites (Honegger) | ELGAR | 117 La Grande Duchesse (Leibowitz) | 123 Eclogues (Stepan) |
| 104 Violin sonatas (Vegh) | 108 Cello concerto (Casals) | PATTERSON | VALEK |
| 104 Violin sonatas (Accardo) | 112 'Caractacus' (Groves) | 117 Kyrie / etc (Wills) | 113 Symphony 10 (Valek) |
| 105 Diego Blanco (gtr) plays Bach | 112 Coronation Ode / etc (Gibson) | PROKOFIEV | VERDI |
| BEETHOVEN | FLOSMAN | 117 Piano transcriptions (Ortiz) | 109 Te Deum (Stephani) |
| 105 Symphony 4 (Dorati) | 113 Violin Concerto (Gertler/Valek) | RACHMANINOV | VIVALDI |
| 105 Symphony 7 (Loughran) | HANDEL | 117 Piano Concerto 3 (Berman) | 123 The Four Seasons (Shepherd) |
| 107 Prometheus / Overtures
(Klemperer) | 113 Coronation Anthems (Pritchard) | 117 Piano Concerto 3 (Alfidi) | 123 Cello concertos (Walevska) |
| 107 Violin sonatas 1 & 10 (Perlman) | HARRIS | 117 Piano transcriptions (Ohlsson) | WALTON |
| 107 Violin sonatas 2 & 4 (Grumiaux) | 113 Symphony 5 (Whitney) | REUBKE | 123 Gloria / etc (Frémaux) |
| 107 Piano sonatas 28 & 30 (Ashkenazy) | HAYDN | 115 Piano sonata (Milne) | |
| 105 Piano sonatas 16 & 18 (Lill) | 112 String quartet in D (Panocha Qt) | RIMSKY-KORSAKOV | |
| BENDA | 113 Piano trios (Beaux Arts) | 119 Scheherazade (Stokowski) | Collections |
| 107 Harpsichord concertos (Hala) | HINDEMITH | ROSSINI | ORCHESTRAL |
| BERLIOZ | 115 String quartets 2 & 3 (Kreuzberger
Qt) | 119 'The Barber of Seville' (Erede) | 119 Rule Britannia (Groves) |
| 108 Harold in Italy (Zukerman/
Barenboim) | 113 Kleine Kammermusik (Vienna
Wind) | SCARLATTI | 121 Stokowski Transcriptions
(Stokowski) |
| BLISS | IBERT | 119 Harpsichord sonatas (Rowland) | INSTRUMENTAL |
| 108 Cello Concerto / Miracle (Noras/
Berglund) | 113 Trois pieces breves (Vienna
Wind) | SCHUBERT | 105 Sir John Barbiroli |
| BRAHMS | JANACEK | 119 Symphony 9 (Mehta) | 105 Baroque Masterpieces for
Trumpet and Organ |
| 108 Symphony 4 (Reiner) | 113 Mladi (Vienna Wind) | 112 Quartettsatz (Panocha Qt) | 105 Baroque Suites |
| 108 Cello sonata (Casals) | JEZEK | SCHULHOFF | 111 Divertimento |
| 108 Hungarian dances (Beroff/
Collard) | 111 2-violin sonata (Sukovo) | 111 Violin sonata (Novak) | 113 Guitarra Espanola (Blanco) |
| 108 Violin Concerto (Korsakov) | LEONI | SCHUMANN | 113 Improvisations (Menuhin/etc) |
| BRITTEN | 'L'Oracolo' / etc (Bonyngé) | 119 Carnaval / Waldszenen (Costa) | VOCAL |
| 109 Phaedra / Vocal music (Britten) | LIGETI | SIBELIUS | 108 Jussi Björling Recital |
| 109 Church Music (New College) | 113 10 Pieces (Vienna Wind) | 119 Symphony 4 / The Bard
(Berglund) | 112 Album of English Songs
(Partridge) |
| BRUCH | LISZT / BUSONI | R. STRAUSS | 121 To Entertain the Stealth of Love
(Fortune's Fire) |
| 109 Violin concerto 2 / etc (Perlman) | 115 Fantasy and fugue (Milne) | 103 'Der Rosenkavalier' (De Waart) | 123 Andrew Wicks: Chichester
Cathedral Chorister |
| BRUCKNER | LOCKE | STRAVINSKY | Reissues |
| 109 Te Deum (Stephani) | 115 'The Tempest' / etc (Hogwood) | 121 Petrushka / Rite of Spring (Dorati) | 125 ORCHESTRAL |
| BUXTEHUDE | MARTINU | 121 Soldier's Tale (Zalkowitsch) | —music by Beethoven, Bernstein,
Bizet, Britten, Chabrier, Dvorak,
Gershwin, Granados, Haydn,
Mozzowski, Mozart, Rimsky-
Korsakov, R. Strauss |
| 111 Organ works Vol. 4 (Chapuis) | 113 Symphony 5 (Whitney) | TCHAIKOVSKY | CHAMBER/CONCERTOS |
| CAJKOVSKIJ | | 121 Piano Trio (Zhukov/etc) | —music by Bach, Handel, Haydn,
Mozart, Nielsen, Paganini, British
composers |
| 111 String quartet 4 (Sukovo Qt) | | | VOCAL/OPERATIC |
| DONIZETTI | | | —music by Bach, Gay, Handel,
J. Strauss |
| 111 'Gemma di Vergy' (Queler) | | | MISCELLANEOUS |
| | | | —Age of Gold, World of Dvorak,
World of Opera, Henry VIII,
Elizabeth I |

DECISIONS DECISIONS



How do you decide which loudspeakers you need for your HiFi system? One make may be good for this . . . and another for that.

Only one manufacturer, Monitor Audio, offers a selection of really superb loudspeakers which gives you a full choice within that one range.

Each of the MA loudspeakers, from the small but distinctive to the large and impressive, is the very best in its range. And each is designed to attain the highest standards of sound reproduction and quality of finish for its size and price.

If reputation and critical acclaim are anything to go by, you'll find it easy to decide on Monitor Audio. Then with your keen ear and the advice of one of Monitor's 150 agents you will easily select the model that suits your needs best.

You'll find Monitor Audio is an investment in listening pleasure.

Please send me full colour brochures and independent test reports on the full range of Monitor Audio products.

Name.....

Address.....

Please enclose large SAE.

 **Monitor
Audio Ltd**

347 Cherry Hinton Road, Cambridge CB1 4DJ
Telephone (0223) 46344 & 42898

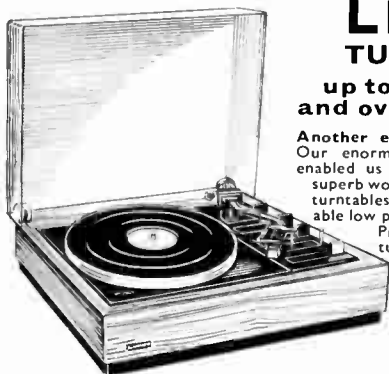
NUSOUND

See Adjacent Page

BARGAIN BUYS!!

LENCO TURNTABLES

up to and over **50% off**



Another exclusive Nusound Scoop. Our enormous purchasing power has enabled us to buy a quantity of these superb world famous Swiss transcription turntables and offer them at unrepeatable low prices.

Producers of some of the finest turntables currently available.

Lenco are renowned for their high standard of Swiss engineering and their beautiful styling. Here is your unique opportunity to purchase one of these precision transcription turntables at once in a lifetime price.

VERY LIMITED SUPPLIES AVAILABLE SO HURRY

BUY NOW WHILE STOCKS LAST! Add £2.50 to all prices for Mail Order C&I.

1977 MODELS

L80 2-Speed (33 $\frac{1}{3}$ and 45) belt driven transcription unit driven by 16 pole synchronous motor with $\pm 1\%$ fine speed adjustment. Lightweight 'S' bend tonearm with detachable headshell on ball race/point bearings. Viscous damped tonearm lift. Stylus pressure adjustable 0.5-5g. Complete in beautiful teak finish plinth with finger removable acrylic dust cover. Overall size 460mm x 365mm x 142mm
LIST PRICE £78.75

OUR PRICE **£39.95** SAVE OVER £38!!

L82 Specification as L80 but with Auto lift off and Auto stop facility.

LIST PRICE £90.00
OUR PRICE **£44.95**
SAVE OVER £45!!

L84 Specification as per L80 but with Auto record selection. Auto play. Auto lift off. Auto return and Auto stop facility.

LIST PRICE £106.95
OUR PRICE **£54.95**
SAVE OVER £51!!

L90 All electronic, fully Automatic belt drive transcription turntable built to highest possible Swiss DIN standards. I.C. Electronics to Automatically control switch off tonearm lift and fine speed adjustment (+7%, -3%) 16 pole synchronous motor, illuminated stroboscope, viscously damped spring suspension and anti skating device. Tonearm mounted on 4 sets of precision ball bearings. Stylus pressure adjustable from 0.5g. CD4 record play facility incorporated. Fitted in superb teak finish cabinet with detachable dust cover. Overall size 462mm x 362mm x 142mm.

LIST PRICE £181.48
OUR PRICE **£84.95** SAVE OVER £96!!

L62 Superb 2-speed belt drive transcription turntable with Auto stop facility. Viscously damped suspension and tonearm lift. Anti skating device with separate adjusting scales for elliptical and spherical styli. Complete in beautiful teak finish plinth with detachable dust cover. Overall size 426mm x 321mm x 148mm.

LIST PRICE £87.50
OUR PRICE **£39.95** SAVE OVER £47!!

L65 Same specification as L62 but with additional facility of Automatic lowering tonearm after selection of record size. Auto play. Auto lift off. Auto return. Auto stop facility.

LIST PRICE £94.50
OUR PRICE **£44.95** SAVE OVER £49!!

GOLDRING TURNTABLES

Another Nusound bargain! Limited supplies of this famous belt drive, 2 speed (33 $\frac{1}{3}$ and 45). Turntables at an unbelievably low price. You will never again be able to buy a belt drive turntable of this quality at these silly prices. Buy now—Very limited supplies available.

G103 2speed, belt drive. 16 pole synchronous motor, detachable headshell, viscously damped pick-up lowering device. Beautifully presented in Teak or Walnut finish plinth with lift off tinted acrylic lid. Overall size 432mm x 346mm x 432mm

LIST PRICE £58.86
OUR PRICE **£29.95** SAVE OVER £28!!

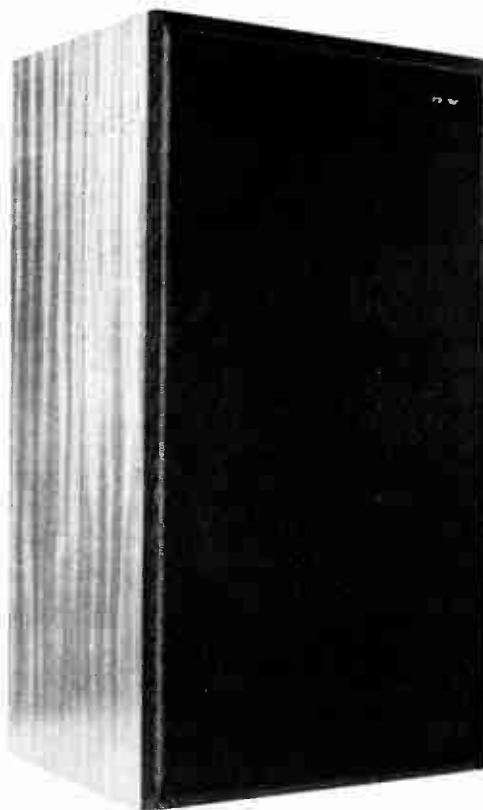
GK 2 Kit A kit version of the famous G103 enabling you to assemble this superb belt drive turntable.
OUR PRICE **£19.95**

All prices include VAT and are correct as at 28/4/77. E. & O.E.

SEE ADJACENT PAGE

Presenting
the

IMPERIAL



Power Rating: 15 Watts RMS

Frequency Range: 45 c/s to 20 Kc/s

Nominal Impedance: 15 ohms.

Relative Efficiency: 96 dB at 3 watts and 1 metre

Size: 36" x 19 $\frac{1}{2}$ " x 15". Finish: Teak or to order

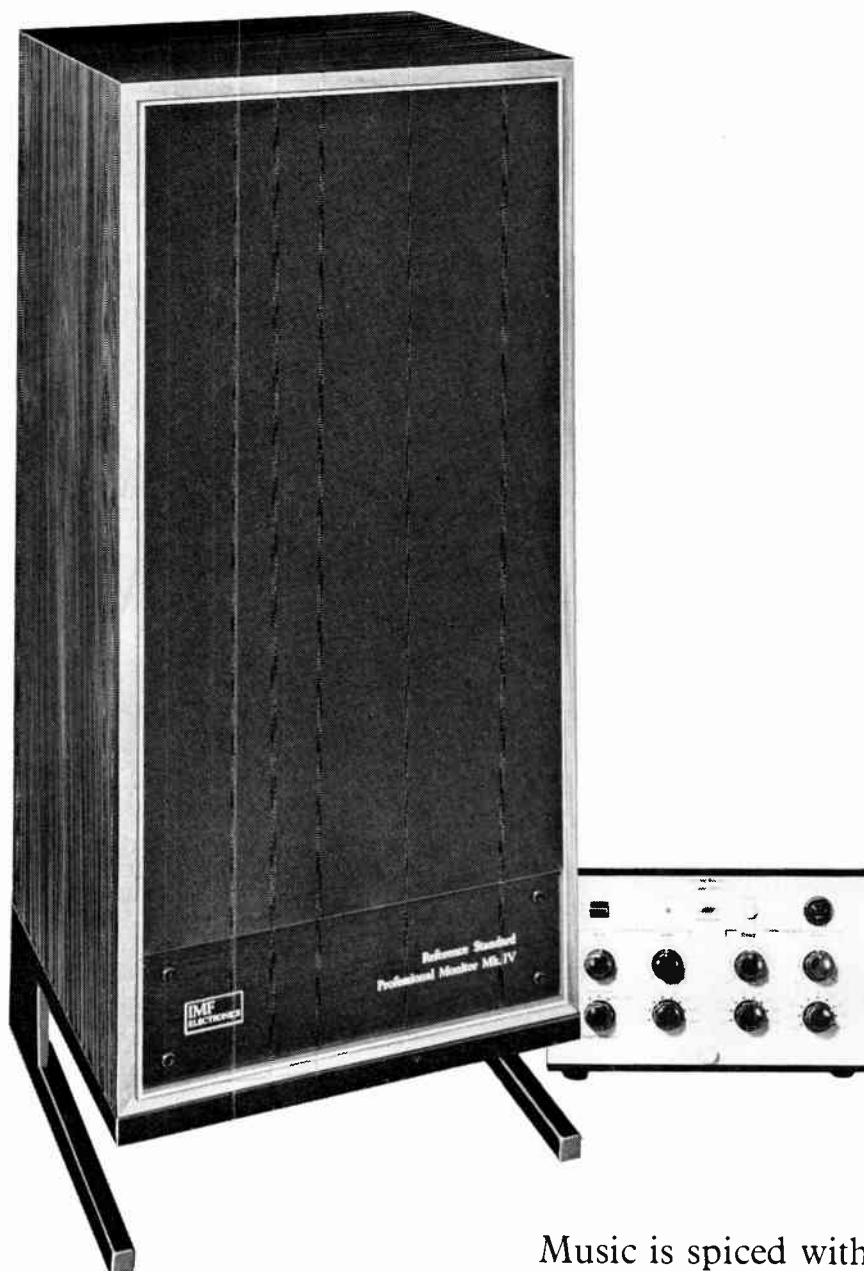
AUDAN AUDIO LTD.

10 KINGS YARD,
150A PUTNEY BRIDGE ROAD,
LONDON SW15

Telephone: 01-785 9191

for
SIMPLY SUPERB SOUND

rise and fall



Music is spiced with transients; requiring rapid response. Precise damping is critical.

Measurements are essential. But design by data only, remains to be achieved. Experienced ears are rare

monitor loudspeakers

Westbourne Street High Wycombe Buckinghamshire Tel High Wycombe 35576



GRATISPOOL

TEAK



CASSETTE RECDRERS/DECKS

A170	142.95
A400	183.95
A420	231.95
A440	260.95
A460	306.95
A650	358.95

OPEN REEL RECDRERS

A2300 SX	345.95
A2300 SD	419.95
A3300 SX2T	491.95
A3340 S	693.95

ACCESSORIES

Model 2 Mixer	184.95
DBX117 Enhancer	136.95
DBX119 Enhancer	154.95
DBX122 Enhancer	216.95
DBX124 Enhancer	314.95

TRIO



AMPLIFIERS

KA7300	249.95
KA5500	189.95
KA3500	109.95
KA1500	69.95

TUNERS

KT7300	199.95
KT5300	89.95

TUNER/AMPS

KR6600	329.95
KR5600	249.95
KR4600	214.95
KR3600	168.95
KR2600	109.50

RECDRD DECKS

KD500	179.95
KD5033	184.95
KD1033 Inc. Magnetic Cart	54.50
KD2055	85.95

CASSETTE RECDRERS/DECKS

KX620	154.95
KX520	129.50

ROTEL



AMPLIFIERS

RA212	59.95
RA312	71.95
RA412	92.95
RA712	112.95
RA1312	289.95
RA913	173.95

TUNERS

RT224	67.95
RT324	84.95
RT724	99.95
RT1024	277.95

TUNER/AMPS

RX102 II	79.95
RX152 II	99.95
RX202 II	116.95
RX402	154.95
RX602	180.95
RX603	222.95
RX803	278.95

RECDRD DECKS

RP900	64.95
RP1500 with arm	75.95
RP3000 less arm	92.95
RP3000 with Arm	110.95
RP1500 less Arm	59.95
RP3300	78.95
RP5300	103.95

AUDID SYSTEMS

RM5010	349.95
--------	--------

CASSETTE RECDRERS/DECKS

RD20	168.95
RD12F	168.95

HEADPHONES

RH930	30.95
-------	-------

COMPLETE SYSTEMS

SAVE ON OUR NORMAL DISCOUNT PRICES BY BUYING A COMPLETE HI-FI SYSTEM*. CALL IN AT OUR NEAREST BRANCH AND LET US QUOTE YOU FOR THE SYSTEM OF YOUR CHOICE. HERE ARE JUST A FEW EXAMPLES.

J.V.C. JAS11 AMPLIFIER
ROTEL RP900 RECORD DECK
SHURE M75ED CARTRIDGE
ACOUSTIC RESEARCH
AR7X SPEAKERS
OUR NORMAL PRICE £239.80

SYSTEM PRICE

227.70

TRIO KA3500 AMPLIFIER
YAMAHA YP511 RECORD DECK
SHURE M95ED CARTRIDGE
CASTLE KENDAL
(TEAK) SPEAKERS
OUR NORMAL PRICE £373.35

SYSTEM PRICE

343.50

YAMAHA CR620 TUNER/AMP
THORENS TD160 MK II
RECORD DECK
SHURE M95ED CARTRIDGE
AR17 SPEAKERS
OUR NORMAL PRICE £493.80

SYSTEM PRICE

450.70

YAMAHA CR620 TUNER/AMP
SONY TC206 CASSETTE DECK
KEF REF103 SPEAKERS
OUR NORMAL PRICE £626.85

SYSTEM PRICE

580.95

YAMAHA CA610 AMPLIFIER
AIWA 6500 CASSETTE DECK
THORENS TD145
RECORD DECK
SHURE M95ED CARTRIDGE
KEF CALINDA SPEAKERS
OUR NORMAL PRICE £736.75

SYSTEM PRICE

688.65

*EXCLUDING MUSIC CENTRES

GARRARD

RECDRD DECKS

DD75 with Cartridge	97.95
---------------------	-------

AUDID SYSTEMS

GA150	229.95
-------	--------

ACCESSORIES

Stand for GA150	14.95
-----------------	-------

B & W

SPEAKERS

DM2A	202.95
DM4	144.95
DM5	96.95
DM6	387.95

SHURE

CARTRIDGES

M55E	8.45
M75B	10.45
M75EJ	13.45
M75ED	15.95
M95Ed	19.95
V15 Mk III	49.95

CARTRIDGE STYLUS

N55E	6.95
N75B	6.45
N75EJ	8.45
N75ED	11.95
N95ED	16.95
VN35E	19.45

Videotone

SPEAKERS

Hi Fi Encyclopaedia	39.95
Minimax II	49.95
Saphir I	59.95

Wharfedale

SPEAKERS

Denton 2XP	44.95
Linton 3XP	64.95
Glandale 3XP	89.95
Chevin XP	29.95
Dovedale	154.95
ESD	239.95
E70	294.95

CASTLE

SPEAKERS

Richmond Teak	67.95
Richmond Walnut	68.95
Kendal Teak	94.95
Kendal Walnut	98.95

PRICES INCLUDE V.A.T.

IMPORTANT NOTICE

All items in this advert are offered subject to availability and all prices were correct at time of going to press. (E & OE). Due to world currency fluctuations, prices are subject to change without notice. Although we make every effort to maintain stability, please confirm price is unchanged when you call, write or phone.

10 Martineau Way
Birmingham B2 4UN
Tel: 021-236 1024

38 Lands Lane
Leeds LS1 6LB
Tel: 0532 35714

82 King Street
Maidenhead
Tel: 0628 25483

27 Queen Victoria St.
Reading
Tel: 0734 586650

66 Queen Street (DEPT. JP35)
Glasgow G1 3DS
Tel: 041-221 3740

GRATISPOOL

MAIL ORDER COUPON

UNITED KINGDOM MAINLAND ONLY



PLEASE NOTE: SOME MANUFACTURERS PRODUCTS ARE ONLY AVAILABLE IN CERTAIN BRANCHES - CHECK BEFORE ORDERING.

CARR. PKG. & INS.

Cassette Packs/Sure Cartridges	.30
Portable Cass./Radio/H'phones	1.50
Amps/Tuners/Cass. Decks	2.00
Turntables/Music Systems & Speakers	3.00

Please Supply

I Enclose: Full cash price inc. Carr : Pkg : Ins. I wish to pay by

Access/Barclaycard and authorise you to debit my account with the amount shown above.

No

Name

Address

Signature..... WHF 7



McOnomy hi-fi

BUSH BT 8503

Stereo Cassette Deck

Rec. Price
£77.51

£36.54



FERGUSON 3279

Hi Fi
Stereo
Cassette deck

Rec. Price £64.95

£44.54



AMSTRAD 7070

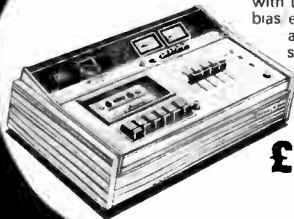


Front Loading Cassette
Deck with Dolby,
Autostop

£84.90

PIONEER CT 4141A

with Dolby independent
bias equalisation selectors,
auto stop and permalloy
solid heads.



Rec. Price
£135.82

£92.50

PIONEER CT5151

with Dolby, bias and
equalisation switch, skip,
memory rewind,
auto stop.



Rec. Price £154.22

£108.90

TUNER/AMPLIFIERS

AKAI AA 1010	178.50	109.90
AKAI AA 1020	219.50	134.90
AKAI AA 1030	245.00	164.90
ALBA 1500	—	74.90
AMSTRAO 5050	—	89.50
GOODMANS Module 90	—	129.94
GOODMANS Module 120	—	139.94
GOODMANS Module 150	—	219.94
LEAK 3200	225.65	154.90
LEAK 3400	282.74	194.90
MARANTZ 4400	986.97	819.90
MARANTZ 2325	750.11	619.50
MARANTZ 2275	650.09	539.50
MARANTZ 2250	523.64	434.50
MARANTZ 2235	401.69	229.50
MARANTZ 2225	252.78	209.50
SUPERSCOPE R1240 by MARANTZ	205.27	89.94
SUPERSCOPE R1270 by MARANTZ	240.00	109.94
PHILIPS RH851 AM/FM/MPX tuner amp. stereo cassette deck, ONL with two speakers	—	149.94
PIONEER SX 300	104.90	69.94
PIONEER SX 450	161.40	114.90
PIONEER SX 550	199.37	144.90
PIONEER SX 650	271.26	204.90
PIONEER SX 750	322.80	239.90
PIONEER SX 850	430.45	319.90
PIONEER SX 950	494.20	369.90
ROTEL RX 102 Mk. 2	120.45	74.94
ROTEL RX 152 Mk. 2	137.00	89.94
ROTEL RX 202 Mk. 2	156.75	99.90
ROTEL RX 402	207.90	124.90
ROTEL RX 602	273.90	149.94
ROTEL RX 603	300.65	217.90
ROTEL RX 803	376.25	269.90
SANSUI 331	155.76	99.90
SANSUI 551	209.21	109.94
SANSUI 661	268.14	149.94
SANSUI 5050	268.14	179.50
SANSUI 6060	322.05	214.90
SANSUI 7070	436.26	289.90
SANSUI 9090	633.35	399.90
SANYO OCX 1850	—	64.94
SANYO OCX 2000	—	79.94
SANYO OCX 4000	—	99.94
SANYO OCX 6000	—	119.94
SANYO OCX 8000	—	129.94
TRIO KR 2600	149.95	109.50
TRIO KR 3600	197.50	172.00
TRIO KR 4600	247.50	215.00
TRIO KR 5600	287.50	250.00
TRIO KR 6600	380.00	330.00

MARANTZ 1070	218.24	179.50
MARANTZ 1150	398.09	333.90
MARANTZ 1150D	495.70	419.90
MARANTZ 3800 pre-amp	778.64	648.90
MARANTZ 510 M pow amp	1065.97	889.90
MARANTZ 3200 pre-amp	193.03	162.50
PIONEER SA 5300	85.86	57.94
PIONEER SA 5500 Mk II	92.79	67.90
PIONEER SA 7300	162.62	109.94
PIONEER SA 7500	238.14	159.94
PIONEER SA 8500	271.22	179.94
PIONEER SA 9500	363.80	229.94
PIONEER SA 9900	539.80	399.90
ROTEL RA 212	82.35	49.94
ROTEL RA 312	97.10	67.50
ROTEL RA 412	125.30	88.50
ROTEL RA 712	152.00	99.50
ROTEL RA 812	217.55	149.50
ROTEL RA 913	234.47	169.50
SANSUI AU 2900	100.01	64.90
SANSUI AU 3900	143.06	94.90
SANSUI AU 4900	173.38	114.90
SANSUI AU 5900	246.53	166.90
SOLAVOX 20 10 watts RMS per channel	45.53	24.54
SOLAVOX 30 15 watts RMS per channel	53.46	29.54
TRIO KA 1500	79.95	69.95
TRIO KA 3500	125.00	109.50
TRIO KA 5500	218.50	190.00
TRIO KA 7300	287.50	250.00
TRIO MOD. 600	635.00	550.00

TUNERS

AKAI AT 2200	116.00	79.90
AKAI AT 2400	181.00	123.90
AKAI AT 2600	215.15	154.90
ALBA UA 800A	—	49.50
AMSTRAO 3000 Mk. 2	—	41.50
LEAK 3900T	306.30	219.90
MARANTZ 104	110.06	99.90
MARANTZ 112	209.79	174.50
MARANTZ 150	502.27	414.50
PIONEER TX 5500 Mk II	105.54	77.90
PIONEER TX 7500	189.42	124.94
PIONEER TX 9500	261.87	169.94
ROTEL RT 224	90.30	57.90
ROTEL RT 324	114.85	79.50
ROTEL RT 724	136.70	89.90
ROTEL RT 824	214.65	139.90
SANSUI TU 3900	151.89	99.50
SANSUI TU 5900	223.84	139.50
TRIO KT 5300	105.00	89.95
TRIO KT 7300	230.00	189.95
TRIO MOD. 600T	575.00	495.00

STEREO AMPLIFIERS

AKAI AM 2200	121.01	84.50
AKAI AM 2400	182.00	129.90
AKAI AM 2600	234.45	166.50
AKAI AM 2800	299.95	219.90
ALBA UA 700A	—	48.50
ALBA UA 900	—	76.50
AMSTRAO 8000 Mk. 3	—	29.50
AMSTRAO IC 2000 Mk. 3	—	41.50
GOODMANS Model 40 40	—	64.94
LEAK 3900A	371.78	249.50
MARANTZ 1030	96.47	79.90
MARANTZ 1040	174.38	143.90
MARANTZ 1060	150.90	124.90

TURNTABLES

AKAI AP003 and A111 cartridge	137.50	79.90
AKAI AP006 direct drive	249.50	109.94
AMSTRAO TP120	—	39.90
CONNOISSEUR 802	57.38	34.90
GARRARD 0075 direct drive	131.06	79.90
GOLDRING G103 PC belt drive	54.00	29.94
GOLDRING L80 PC	78.75	39.94
GOLDRING L82 PC auto stop	90.00	49.94
LEAK 3001	131.09	94.50
MARANTZ 6200	155.57	129.90
MARANTZ 6300	237.98	194.90
MARANTZ 6320	187.56	154.90
PIONEER PL1120	77.03	54.90

Super Service — The McOnomy Way ...

● CREDIT TERMS AVAILABLE ● ALL OUR PRICES INCLUDE VAT!

- **GUARANTEE** — 12 months guarantee covering parts and labour on all products.
- **DELIVERY SERVICE** — up to 25 miles for a small charge.
- **AFTER SALES SERVICE** — fully equipped service departments always at your disposal.
- **BRAND NAMES** — products sold by McOnomy bear the name (and carry the reputation) of well-known manufacturers.
- **DISPLAY** — all products in McOnomy stores are clearly displayed in comfortable surroundings.
- **LATE OPENING** — McOnomy stores open to your convenience.

Personal callers welcome at all branches.

All offers
subject to
availability.



Super Savers

PIONEER PL1150	96.77	68.90
PIONEER PL1170	143.49	99.90
PIONEER PL150A direct drive	148.02	105.90
PIONEER PL1530 direct drive	231.35	164.50
ROTEL RP1500 with arm	101.95	64.94
SANSUI SR222P belt drive	83.25	53.90
SANSUI FR1080P belt drive auto return	116.53	69.90
SANSUI SR525 direct drive	188.40	119.50
TRIO KD 2055 belt drive	99.50	86.00
TRIO KD 500 less arm	210.00	180.00
TRIO KD 550	235.00	205.00

The following turntables are complete with base, plinth, cover and cartridge, fully wired and ready for use.

GARRARD SP25 Mk. 4 with Shure M75/6/SM	54.84	34.90
GARRARD 125SB with Shure M75/6/SM	73.46	46.90
GARRARD 86SB Mk. 2 with Shure M75/6/SM	104.23	54.90
GARRARD GT55P with Shure M75ED	149.57	84.90
MCDONALD MP60 TPD with ADC K8	52.72	30.50
MCDONALD BOS80 TPD belt drive with ADC K7E	59.06	31.94
MCDONALD BOS90 TPD belt drive with ADC K5E	62.21	33.94
MCDONALD BOS95 TPD belt drive with ADC cartridge	54.83	37.50
PHILIPS GA312 belt drive with GP401	—	76.90
SANYO TP700 SA belt drive auto arm return	(Sp. price)	54.94
SANYO TP1100 direct drive auto arm return	—	119.50
TRIO KD 1033 belt drive inc. mag. cartridge	78.50	54.50

SPEAKERS

ALL SPEAKERS ARE PRICED AS PAIRS

AMSTRAD ACOUSTA 2500	—	39.90
CELESTION Hadleigh	60.28	34.90
CELESTION Ditton 11	92.82	54.90
CELESTION Ditton 15	148.76	89.90
CELESTION Ditton 22	185.62	119.90
CELESTION Ditton 25	329.02	197.90
CELESTION Ditton 33	240.84	142.90
CELESTION Ditton 44	284.62	164.90
GODDMANS Protromic	—	34.94
GODDMANS Achromat 100 Monitor	—	74.90
GODDMANS Achromat 250 Monitor	—	109.90
GODDMANS Achromat 400 Monitor	—	154.90
GODDMANS RB18	—	49.90
GODDMANS RB20	—	65.90
GODDMANS RB35	—	94.90
LEAK 3020	128.56	79.90
LEAK 3030	175.84	104.90
LEAK 3050	245.80	159.90
MARANTZ 4G	84.47	62.90
MARANTZ 5G	124.67	94.90
MARANTZ HD44	159.03	129.50
MARANTZ HD55	219.31	178.90
MARANTZ HD66	311.45	259.90
PIONEER CS313A	78.37	58.90
PIONEER HPM40	186.12	137.50
PIONEER HPM60E	252.86	192.50
SANSUI ES200	221.36	129.94
SOLAVDX TK20	50.29	29.94
SOLAVDX TK30	64.71	39.94
SOLAVDX TK45	120.06	74.94
SOLAVDX speaker stands (pair)	16.99	12.25
TRIO LS202A	89.50	64.90
WHARFEDALE Chevin	42.55	28.90
WHARFEDALE Denton 2XP	63.34	44.90
WHARFEDALE Linton 3XP	91.71	63.50
WHARFEDALE Glendale 3XP	126.68	88.90
WHARFEDALE Doveedale SP	217.44	154.90
WHARFEDALE E50	264.88	239.90
WHARFEDALE E70	324.99	294.90

CARTRIDGES

AMSTRAD M95	—	4.50
ADC XLM	38.68	26.90
ADC VLM	31.40	21.50

AUDIO TECHNICA AT11EP	—	6.75
AUDIO TECHNICA AT13EA	—	11.90
GOLDRING G900 Super E	47.25	29.94
PHILIPS GP401	32.06	9.94
SHURE M55E	12.49	8.25
SHURE M75EJ	19.58	12.50
SHURE M75ED	23.29	14.90
SHURE M95EJ	20.25	12.90
SHURE M95ED	29.36	18.90
SHURE V15 Mk. 3	60.41	44.90
STANTON 500 A	18.68	15.90
STANTON 500 EE	26.16	21.90
STANTON 680 EE	38.64	32.90
STANTON 681 EEE	59.96	49.90

Styli	—	—
GOLDRING D110 Stylus (G800)	4.22	2.75
GOLDRING D110E Stylus (G800E)	9.45	5.75
SHURE N75/6 Stylus	7.76	5.50
SHURE N75EJ Stylus	11.48	8.25

CASSETTE RECORDERS

AKAI CS340 Dolby	120.99	84.90
AKAI CS702D Dolby front load	138.00	97.90
AKAI CS705D Dolby front load	194.40	117.90
AKAI CS707D Dolby front load	242.00	154.90
AKAI GXC390 Dolby	201.20	119.90
AKAI GXC310D Dolby two capstans	241.50	139.90
AKAI GXC325D Dolby two capstans, three heads	355.50	199.94
AKAI GXC710D Dolby front load	311.45	217.90
AMSTRA 7050 Dolby	—	79.90
FERGUSON 3280 Dolby	89.95	64.94
GARRARD GC300 Dolby	157.44	99.94
GARRARD GC350 Dolby front load	193.44	114.94
GODDMANS SC0110 Dolby front load	—	124.90
H.L. PHOENIX CTR1	79.95	32.54
MARANTZ 5020 Dolby front load	205.27	169.50
MARANTZ 5120 Dolby	217.35	179.50
MARANTZ 5220 Dolby front load	229.42	189.90
MARANTZ 5420 Dolby	293.90	244.50
PHILIPS N2511 Dolby ONL	—	102.50
PHILIPS N2415 Recorder inc. two loudspeakers Batt.Mans.	—	77.90
PIONEER CTF 2121 Dolby front load	181.59	119.90
PIONEER CTF 6060 Dolby front load	242.56	169.90
PIONEER CTF 7070 Dolby front load	263.10	187.50
PIONEER CTF 8080 Dolby front load	317.03	237.50
PIONEER CTF 9191 Dolby front load	374.13	289.90
ROTEL RD20 Dolby	226.90	129.94
ROTEL R010F Dolby front load	138.97	99.90
SANSUI SC2000 Dolby front load	206.55	124.94
SANSUI SC2002 Dolby front load	732.86	109.90
SANSUI SC3000/3003 Dolby front load	261.13	174.90
SANYO RD4260 Dolby	—	79.94
SANYO RD4080 Dolby	—	89.94
SANYO RD4600 Dolby auto rewind and repeat	—	159.94
TRIO KX 520 Dolby front load	149.50	129.50
TRIO KX 620 Dolby front load	199.95	155.00
TRIO KX 720 Dolby	220.00	185.00
TRIO KX 920 Dolby	250.00	220.00

TAPE RECORDERS

AKAI 4000 OS Mk. 2 stereo	208.50	139.90
AKAI 4000 DB Dolby stereo	287.50	179.90
PHILIPS N4504 4-track ONL	—	179.90
PHILIPS N4506 4-track ONL	—	254.90

RECORDING TAPES AT MCONOMY'S FAMOUS DISCOUNT PRICES

PLEASE NOTE:

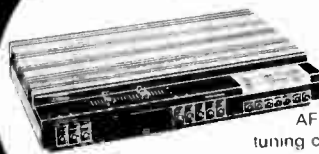
There are no longer Recommended Retail Prices on some brands of Hi-Fi equipment, consequently some Recommended Prices shown are prices recommended prior to the end of September 1976. These are left for your information to assist you in evaluating your purchase.

NEW DISCOUNT RECORD and TAPE BROWSERIE NOW OPEN

OPEN 9.00 a.m. — 8.00 p.m. DAILY; 9.00 a.m. — 5.30 p.m. SATURDAYS
Scottish Branches also open Sunday 10 a.m. — 5.30 p.m.

CARDIFF	52 North Road, Cardiff	Tel. 0222 394016
CLEVEDON	4-9 Kimberley Road, (off Strode Road), Clevedon	Tel. 0272 876041
EDINBURGH	Annandale St. Lane, Edinburgh	Tel. 031-557 1004
GLASGOW	Anderston Cross Centre, Argyle Street Glasgow	Tel. 041-204 2355
HULL	Status City, Clough Road, Hull	Tel. 0482 442134
LICESTER	Rutland Centre, Yeoman Street, Leicester	Tel. 0533 536741
NEWHAVEN	Avis Way, Newhaven	Tel. 0791 2 5081

FERGUSON 3477



Stereo FM tuner/amplifier, 17 watts per channel. AFC and 6 pre-set tuning controls.

Our Price **£49.90**

PHILIPS RB740

Hi-Fi System. Stereo radio stereo records, inc. speakers and BSR C145 turntable module.



Our Price

£64.94

FERGUSON 3491

Stereo FM 2/4 channel Tuner/Amplifier with SQ decoder, Pen balance control, 4 meters, 4 x 1.4 watts output.



Our Price **£69.94**

SANSUI 221



AM/FM Stereo Receiver, 10 watts RMS per channel.

Rec. Price £141.62

£74.90

MARANTZ 2215B

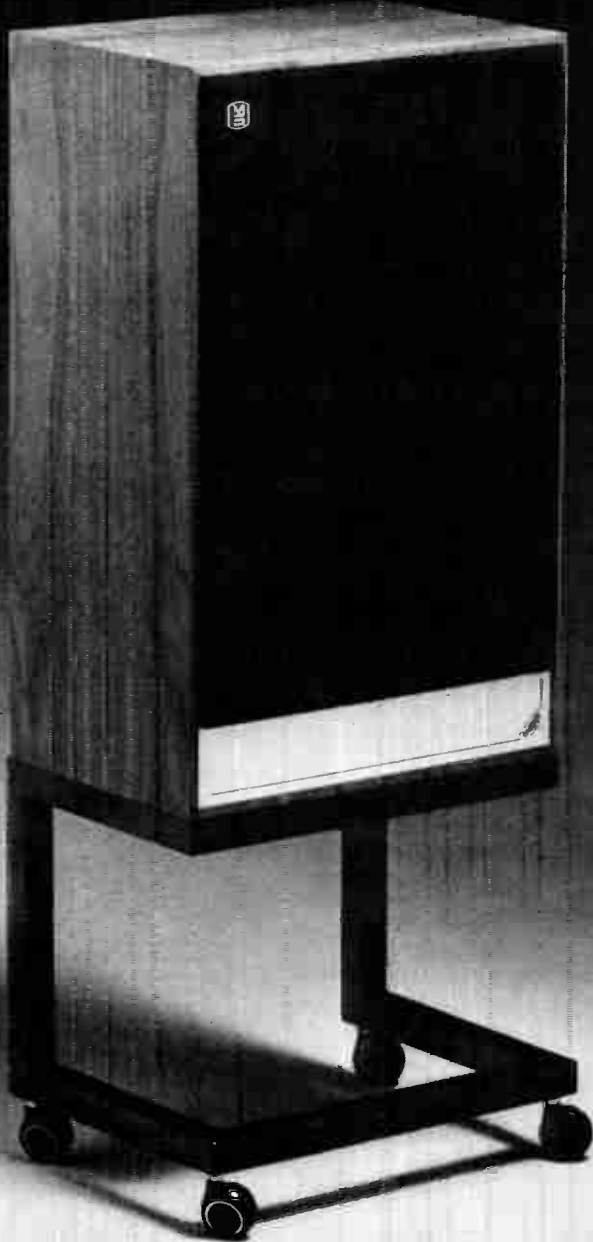


2 x 15 watts RMS, phase lock loop decoder FET RF amps.

Rec. Price £150.90

£114.90

PAGEANT...



"... a well finished system of good performance,
... representing good value for money at its
moderate price."

'GRAMOPHONE'; August, 1976:
Review of PAGEANT SERIES 2.

"... the speakers gave a good account of
themselves on almost every type of material, an
initial favourable impression being confirmed
as the length of acquaintance grew."

"... Mordaunt-Short are on to a real winner here."

'HI-FI SOUND'; August, 1976:
Review of PAGEANT SERIES 2.

"The impression of excellence is further
enhanced when one looks at the technical test
results."

"... a well-engineered, well-executed design,
where attention has been paid to the end
result — the listening experience — with the
result that (the PAGEANT SERIES 2) out-
performs, by a fair margin, all the other
submitted designs in the important area of
'listenability'."

'PRACTICAL HI-FI & AUDIO'; August, 1976:
Comparative review of 6 loudspeaker models.

"Maintaining the high standard set on the live
listening session, the speaker further improved
its ranking relative to the group, assuming the
No. 1 position under stereo programme testing."

"... an unquestionable best buy."

"... undoubtedly an example of consumer
engineering at its best."

'HI-FI FOR PLEASURE'; September & October, 1976:
Comparative review of 30 loudspeaker models.

"I not only recommend this speaker very
highly, but rate it excellent value for money."

ASIAN MUSICIAN, HI-FI CHOICE, LOUDSPEAKERS
& SOUND SYSTEMS, RECORDS AND COMPACT

PAGEANT SERIES 2
£156.00

STAND (Optional)
£22.00

Recommended Retail Price (U.K.) per pair (excl. V.A.T.)

...for the perfectionist.



Mordaunt-Short Ltd
High-Fidelity Loudspeaker Systems

Durford Mill, Petersfield, Hampshire, GU31 5AZ
Telephone: Rogate (S.T.D. 073 080) 721/2

Name _____

Address _____

I am interested in really good speakers. Please send me details.

Ross 66 Cassettes. Quality Hi-Fi...



from beginning to end.



**ROSS
ELECTRONICS**

Quality Hi-Fi from beginning to end.
32 Rathbone Place, London W1P 1AD. Tel: 01-580 7112/3

SAVE NOW,

Right now, our price tags are marked down as low as we can make them. As for credit facilities, our shops have five different schemes which can make payment almost painless, if that's possible. (Plus a special extra service for our mail-order customers.)

£49-95

MARLUX 146 F RECORD DECK
Special purchase. Great value for money in a belt-drive deck. Excellent styling. Cartridge extra. p.p. & ins. £1.65



£129-50

TRIO KX 520 STEREO CASSETTE DECK WITH DOLBY
3-way bias and equalisation switching, auto-stop, illuminated cassette compartment and, of course, Dolby. New economy version of the best-selling KX620. p.p. & ins. £1.65



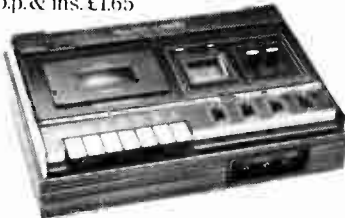
£297-00 pr.

TANNOY DEVON SPEAKERS
Largest bookshelf speakers featuring famed dual concentric drive system. As used in recording and broadcasting studios worldwide. p.p. & ins. £2.20



£79-95

AUDIOTRONIC ACD 770D STEREO CASSETTE DECK WITH DOLBY
Superb deck with Dolby to eliminate tape hiss. Headphone socket, smart black finish. p.p. & ins. £1.65



£49-95

AUDIOSONIC STEREO CASSETTE DECK
Front loading at a fantastic price. Normal and CRO switching; twin microphone inputs headphone socket. p.p. & ins. £1.65



£54-50

TRIO KD1033 RECORD DECK
Best buy in belt-drive decks, we think. S-shaped arm; cueing device; pre-fitted magnetic cartridge. p.p. & ins. £1.65



£133-55

JVC JRS 100 STEREO RECEIVER AM-FM
Output: 22+22 W rms (at 1KHz). Distinctive styling. Slider controls. Large meters for accurate tuning. p.p. & ins. £1.65



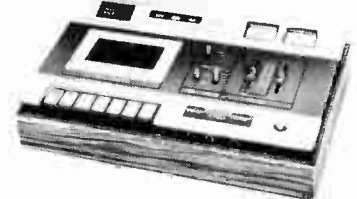
£199-90 pr.

CELESTION DITTON 25 SPEAKERS
Floor standing speaker with a natural and smooth response. Features: atweeter, 2 mid-range units, bass unit and an ABR to augment bottom end. Tk finish. p.p. & ins. £2.20



£94-95

SONY TC118 SD STEREO CASSETTE DECK WITH DOLBY
Switching for normal, chrome, ferrichrome tapes. Limiter to prevent over-recording; autostop; Dolby. p.p. & ins. £1.65



PAY LATER.

Usually, you can take the goods away with you. Or otherwise, without fuss or delay, we'll put it through clearance. Come into any Laskys shop and ask about credit, or send for our latest catalogue.

£79-95

**AUDIOTRONIC ACD 880D
STEREO CASSETTE DECK WITH
DOLBY**

Front loader. Equalisation switching for three tape types. Variable output; autostop; Dolby noise reduction. p.p. & ins. £165



£107-50

**AUDIOTRONIC LA 4040
STEREO AMPLIFIER**

Rated at 40+40 W rms with better than 0.4% THD. Features: Dubbing facilities between 2 tape decks and dual tape monitoring. p.p. & ins. £165



£49-95

**NIKKO TRIM 230
STEREO AMPLIFIER**

14+14 W rms. Facilities for 2 sets of speakers, high filter and tape monitoring button. Great value. Matching AM FM Tuner: Nikko FAM 220 £49.95 p.p. & ins. £165



£69-95

**TRIO KA1500 STEREO
AMPLIFIER**

Loudness control; tape monitoring for two sources; headphone socket. Rated 25+25 W rms. p.p. & ins. £165. Matching tuner (not shown) KT 5300 £89.95 p.p. & ins. £165



£64-95

**AUDIOTRONIC
LA1515 STEREO AMPLIFIER**

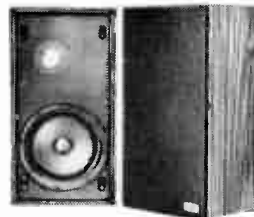
Rated 15+15 W rms. Low and high filters cut out rumble or hiss. Switching for two sets of speakers. p.p. & ins. £165. Matching Tuner LT 2020 (not shown) £74.95 p.p. & ins. £165



£136-90 pr.

KLII 317 SPEAKERS

10" bass, 2 1/4" high frequency units. Recommended for amps rated 10-75 watts. Brown grilles. p.p. & ins. £220



'If you can find a better combination of choice, price and service, I'll eat my hat.' George Meilly.

To: Laskys Customer Services Division, Audiotronic House, The Hyde, Hendon, London NW9 6JJ. (01-200 0444, 24 hour answerphone 01-200 0037).

Please send me your latest catalogue, including credit details...

Name _____

Address _____

LASKYS

HI-FI, TV PORTABLES, CALCULATORS, WATCHES, IN CAR. ALL PRICES INCLUDE VAT. LONDON: OXFORD STREET, TOTTENHAM COURT ROAD, EDGWARE ROAD, FLEET STREET, BRENT CROSS ALSO AT: BIRMINGHAM, BRISTOL, CHATHAM, COLCHESTER, CROYDON, DARTFORD, KINGSTON, LEICESTER, LEWISHAM, MANCHESTER, NORTHAMPTON, NOTTINGHAM, OXFORD, READING, RICHMOND, ROMFORD, SLOUGH, SOUTHEND, SWINDON, TUNBRIDGE WELLS, WATFORD, WOLVERHAMPTON SCOTLAND, AYR, KILMARNOCK, GLASGOW.



It's not only our price-tags that save you money.

QUAD-Quarter of a century of amplifier development



The Acoustical Manufacturing Co. Ltd. have been designing and producing amplifiers since 1936 but it was not until 1951 that the Q.U.A.D. 1 was introduced, the forerunner of the Quad series of Amplifiers which have earned an unrivalled reputation for originality of design, excellence of performance and reliability in the ensuing twenty-five years.

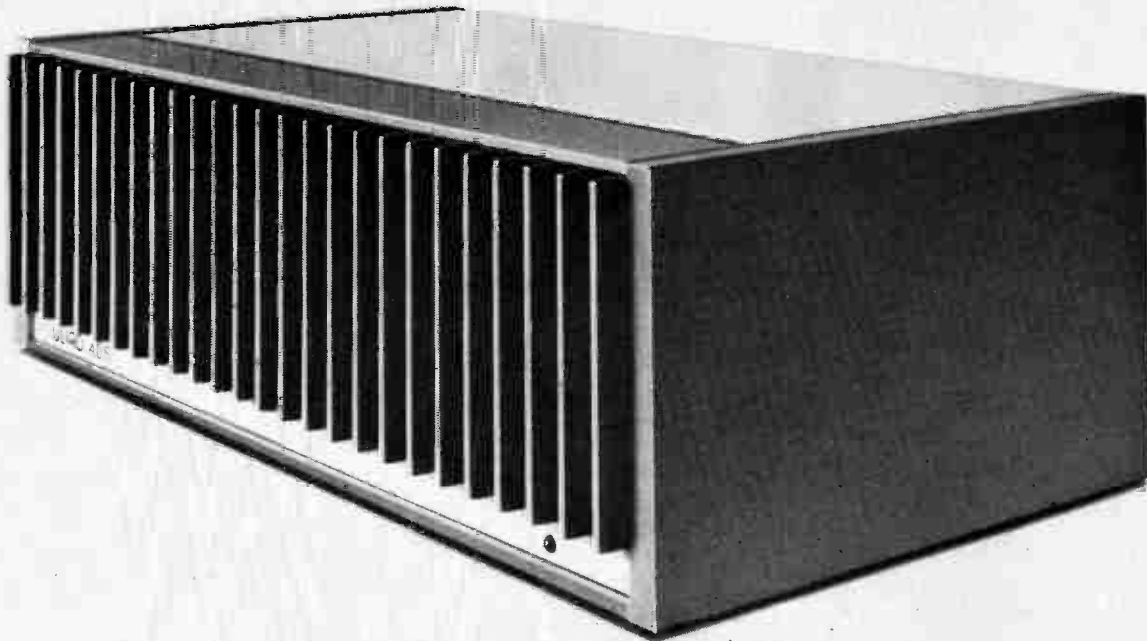
The introduction of the Quad 405 current dumping amplifier represents yet another contribution to the science of sound reproduction.

Current dumping successfully overcomes many of the problems associated with high power amplifiers, crossover, thermal tracking and matching of components, added to which the complete absence of adjustments or alignment requirements, ensures that performance will be consistently maintained.

For further details on current dumping and other Quad products write to Dept. HFN

The Acoustical Manufacturing Co. Ltd.
Huntingdon, Cambs., PE18 7DB
Telephone: (0480) 52561

**Design Council
Award 1976**



QUAD

**for the closest approach to the original sound
for twenty-five years.**

QUAD is a Registered Trade Mark

A Lux music centre is something apart



And so are Lux owners. They like a choice of components and facilities to suit their own particular needs — so Lux's 88 tuner has a choice of three matching amplifiers at 40, 50 and 80 watts per channel. There's a choice of other tuners too with matching amplifiers from 32 to 300 watts per channel.

The Luxman 282 direct drive turntable leaves the choice of cartridge to you and the 121 and 131 turntables also leave you the choice of tone arm. However, when it comes to quality there's absolutely no choice. Lux only know how to make ultimate fidelity equipment.

Illustrated above are the Luxman PD282 turntable, Luxman T88V tuner and Luxman L85V amplifier. For full details of how to make Lux the centre of your music, send for colour brochures and list of specialised Lux dealers to UK Distributors: **Howland-West Ltd., 3-5 Eden Grove, London N7 8EQ. Tel: 01-609 0293/4/5.**



hi-fi news & record review

ALSO INCORPORATES: TAPE & TAPE RECORDERS, AUDIO NEWS, RECORD NEWS, AUDIO RECORD REVIEW, THE GRAMOPHONE RECORD

EDITOR
JOHN CRABBE

DEPUTY EDITOR
PAUL MESSENGER

MUSIC EDITOR
PETER GAMMOND

TECHNICAL EDITOR
DONALD ALDOUS

RECORD REVIEWS EDITOR
GEOFF JEANES

NEWS EDITOR
JOHN ATKINSON

ART EDITOR
MARK STEVENS

MUSICAL ADVISERS
ARTHUR JACOBS & CHRISTOPHER BREUNIG (Classical)
PETER CLAYTON (Jazz)

TECHNICAL ADVISERS
**STANLEY KELLY, REX BALDOCK, JAMES MOIR,
RALPH WEST**

EXECUTIVE ADVERTISEMENT MANAGER
DOUGLAS G. SHUARD

SUBSCRIPTION RATES

Annual U.K. subscription rate for *HFN/RR* is £7-10 (overseas, £8-10). The rate for our associated journal *Studio Sound* is £7-60 (overseas £7-20). All obtainable from Subscription Dept., Link House Publications Ltd., Link House, 25 West Street, Poole, Dorset, BH15 1LL (tel.: 02013 71171). *Hi-Fi News & Record Review* is normally published on the last day of the preceding month, unless that date falls on a Sunday, when it appears on the Saturday.

BINDERS

Loose-leaf binders for annual volumes of *HFN/RR* are available from: *Modern Bookbinders*, Chadwick Street, Blackburn, Lancs. The years 1971 to 1977 are each covered by two binders (January-June and July-December), costing £1-50 each (post paid). For earlier years, please ask for a quotation.

Editorial and Advertising Offices:
LINK HOUSE, DINGWALL AVENUE, CROYDON CR9 2TA
Telephone: 01-686 2599

We regret that technical and editorial queries cannot be answered by telephone.

© Link House Holdings Ltd., 1977. All rights reserved.

 THE LINK HOUSE GROUP

ANSWERS to the May readership questionnaire are pouring in as we write, and *HFN/RR*'s humanoid computer is getting down to detailed analysis. In the meantime, our thanks to all those readers who responded. We only hope that by the time this is being read we will have received some tens of thousands of forms to make the survey really representative.

One form arrived at Croydon without any answers, but with a protest that we had failed to give readers space in which to say what they *feel* about the magazine. Well, we thought that answers to the questions concerning editorial contents would inevitably reveal quite a lot about people's feelings, while many managed to fill in the form *and* add extra comments. However, we apologise to the lone anonymous protester (from Ealing) but assure him that the views he did manage to express will be added to the thousands of others on a democratic basis.

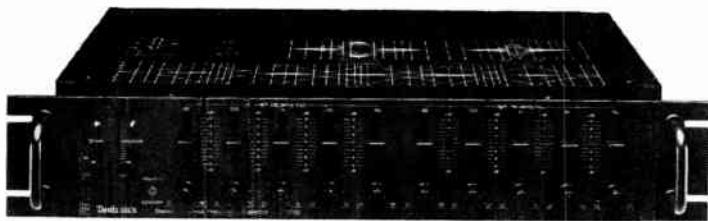
But one point raised by Mr. Ealing Postmark seemed so striking that we shall allow him an undemocratic prominence—albeit in order to exercise the Editor's casting vote in opposition. He pleaded that we should 'cut out contributors who admit they don't know what they are talking about [p. 75, May] . . . not knowing why moving-coil cartridges sound better than moving-magnet'. This sent us back to *Subjective Sounds*, where there was actually no mention of comparative performance of m/c and m/m types. But taking this to be implied, a big open question-mark remains suspended over the subject of pickup quality.

The traditional case for the m/c type is that its transducer system is inherently more linear. But in practice the various modes of suspension employed ensure so much ambiguity of motion, and the amplitudes of motion are so small, that the basic transfer characteristics become swamped by other variables. There is also the matter of what happens on peak music waveforms, as discussed in Jean Hiraga's April article. If his special m/c pickup produced three times the output of any m/m type on music peaks despite equalised nominal sensitivities, one might suspect that the m/m types were cutting off the top 10 dB of modulation. But of course they do no such thing. In fact they manage to reproduce high levels with no more distortion than other types. So what was happening? Was the high output model adding harmonics—or ringing badly—but actually sounding 'better' subjectively as a result?

Even in the best commercial pickup cartridges there are several suppressed resonances within the audio band; many models have an unexplained trough in the response at upper-middle frequencies; damping and response still tend to change with temperature; sound quality differs in various subtle ways between nominally identical models; and so on. In fact no-one yet knows all the answers, and if our contributors sometimes seem a little tentative, this is because hi-fi is still to some extent an art. If anyone tells you that item *x* is better than item *y* because one of its many elements *must* be superior on principle, just remind him of those pedants who *knew* that stones of differing weights fall at different speeds, and turned away in disbelief when Galileo demonstrated otherwise.

In the spirit of Galileo, let us try as far as possible to be scientific, without forgetting that in hi-fi a mass of logically irrelevant but practically entangled variables combine with a huge subjective element to make the subject a blend of physics, psychology and wish-fulfilment. Our loudspeaker supplement in this issue attempts some disentangling in the most diffusely subjective of hi-fi areas: Peter Fryer's article shows how one may bring a scientific approach to the correlation of objective measurements and subjective judgements, while our team's review of eleven speakers follows a middle course between pure measurement and personal impressionism, confirming on its way that this final link in the audio chain remains to some extent a cocktail of virtues and vices. The 'correct' balance of any such blend must be a matter of taste; but even in the amplifier, that supposedly most neutral of creatures, the cocktail's ghost has not yet been laid. On this score we commend Gordon King's article to Galileos and pedants alike—and also Peter Walker's challenge printed in our *Positive Feedback* section.

Technics Newies



Technics have at last opened the cupboard to reveal their major top-of-the-line equipment for 1977. Apart from the reel-to-reel machine (which was shown in our January Tokyo report) we have been unable to show pictures owing to our incompetent itinerant journalist being unable to get a decent photo despite opportunities at Toyko and Paris. (He claims that Technics made the gear dark brown on purpose and used low level lighting because they knew he was coming.)

The range consists of one front-loading and two portable cassette machines, the aforementioned reel-to-reel (which has collected more than enough prizes in Japan to justify its £900 price tag); the 90 series 'separates' (FM tuner, pre-amp, power amp, stereo graphic equaliser and a meter unit); an Elcaset deck; and a £1000 integrated record playing unit based on the SP10 Mk II.

Dealing with some of these in greater detail, the £450 (inc. VAT) RS686 is the bootlegger's and field recordist's dream. It is an ultra compact three-head (combined

porates a wealth of features to make field recording easy, such as an anti-rolling mechanism to reduce wow and a three-minute end-of-tape warning light. The RS646 is a larger multi-purpose Dolby machine which is designed for mains, 12 V car battery or dry battery use. The specification is only marginally inferior, although it weighs 11 lb and is significantly larger. Price is a competitive £220 inc. VAT.

The SL1000 Mk 2 is a record playing system based on the ultra high torque SP10 Mk 2 turntable and will cost nearly £1000. The £240 EPA-100 arm features a titanium tube, ruby ball-bearings and variable magnetic damping. For the same (!) price there is a plinth of sandwich construction, a top layer of bonded obsidian aggregate, middle layer of rubber and base of wood.

Technics' Elcaset deck may be the ugliest of its breed but it appears to offer good value for money at £380 with full three-head operation. The reel-to-reel RS1150 has more features than we have space to list, but this first foray into open-reel hardware by Technics will certainly give the competition something to worry about.

The five 'low profile' items would appear to be competitively priced and are extremely smart. The pre-amp (SU-9070) is a 'no-frills' device but includes m-c cartridge input; the power amp (GE 9060) has a 70 w.p.c. capability; the tuner (ST9030) is FM only with a high specification, and incorporates automatic switching for appropriate selectivity; the equalizer (SH-9010) has five bands for each channel, with each band having adjustable cut-in point (± 1.6 octaves) and Q (steepness of slope); the meter unit contains variable ballistic meters which can be switched to various points in the system. Most of the units will cost just less than £300 each inc. VAT.



Our artist's impression of the high torque SL1000 Mk. 2

record/replay with third head for monitoring) Dolby cassette deck that weighs only 6 lb. If incor-

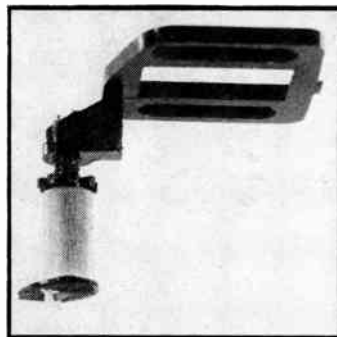
A New Damping Technique

Close watchers of the audio scene may have noticed a paper presented by Alec Rangabe at the 50th AES Convention (1975) entitled 'A New Method of Arm/Cartridge Damping'. This described an unusual system of applying damping to the arm/cartridge combination by means of a miniature 'shock absorber' attached to the headshell and resting on the record surface.

We have now heard of two such devices coming onto the marketplace which operate in a broadly similar way albeit with considerable detail differences.

The first of these, called the Pickup Damper, has been developed by Alec Rangabe in association with Audiomaster and has considerable detail changes from the original idea.

The 'shock absorber' is fixed to a small plastic frame which fits between the cartridge and the headshell. It is essentially resistive in nature and has a small PTFE skid which has critical shape and compliance to avoid 'needle-talk'. Great care has been taken



Alec Rangabe's Audiomaster device

surface (rather than the grooves).

The second device is made by Discwasher, Inc. in the U.S.A. and is being imported by Lentek. The DiscTraker fits onto the top of the headshell and is a pneumatic (i.e. partially elastic) device. Instead of a skid, there is a specially designed pad which sits on the record surface.

The DiscTraker claims to effectively reduce arm/cartridge resonance and enable warped records to be played without damage.

The Audiomaster device is expected to cost £15; the DiscTraker £30. However one cannot help but wonder whether the similarity of the two devices will



DiscTraker traking (sik!)

to ensure its universal application to decks, arms and cartridges, the only cartridge which appears to be too large being the Onlife.

The Rangabe device is designed to reduce the susceptibility of the system to the subsonic record warps which can cause mistracking in themselves or by exciting the fundamental arm/cartridge resonance. These warps can be shown to exist on all discs and can cause intermodulation distortions. This is achieved by effectively coupling the headshell to the disc

cause any patent problems. *Lentek*, 9 Station Road, St. Ives, Huntingdon, Cambs. *Audiomaster Ltd.*, 33 Bridle Path, Watford, Herts, WD2 4BZ.

H.H. S500-D Availability

The H.H. S500-D professional power amp, mentioned in 'News' in May, is only available from two retail outlets, UPL of New Malden, Surrey and REW Audio Visual of Charing Cross Road in London. H.H. hope to have a matching pre-amp available some time in 1978.

Dollonds

GIVE UPTO

18 months FREE credit

Pay just
1/3rd of the Price
as a Deposit and the
rest over 8, 12 or 18 Month
WITH NO INTEREST
CHARGES!
*On Equipment with a
Retail Value of £100
and over

ARMSTRONG

BRITISH-MADE EQUIPMENT OF HIGH QUALITY!



MODEL 626



MODEL 623



MODEL 621

ARMSTRONG 621 AMPLIFIER

Five years in development (with a host of additions and improvements since its launch in 1973), this superb amplifier has an output power of 40 watts RMS per Channel, with negligible distortion and a wide frequency range. Facilities include two treble filters (with a slope control providing a choice of four characteristics), two choices of disc sensitivity and adjustable tape recording outputs. Headphones and two pairs of speakers can be used simultaneously or enjoyed independently.

£132.00 £44.04 DOWN & 12 Monthly Payments
of £7.75 INTEREST FREE

ARMSTRONG 623 AM/FM STEREO TUNER

With this tuner, Armstrong have achieved a specification very close to the theoretical performance limits of the FM broadcasting system. Almost unmeasurable distortion due to Bandpass filtering, dual gate FET's, varicap diode tuning, ceramic I.F. filters, integrated circuits and a phase-locked loop stereo decoder. The AM section is hardly less impressive due to the use of the latest communication receiver techniques. Three FM and three AM stations can be pre-set.

£140.00 £47.00 DOWN & 12 Monthly Payments
of £7.75 INTEREST FREE

MODEL 624 — With a similar specification to the 623 Stereo Tuner, but without AM section.

£109.00 £37.00 DOWN & 12 Monthly Payments
of £6.00 INTEREST FREE

ARMSTRONG RECEIVERS

MODEL 626 — With a similar specification to the 621 Amplifier and 623 Tuner combined.

£232.00 £78.10 DOWN & 18 Monthly Payments
of £8.55 INTEREST FREE

MODEL 625 — As model 626, but without AM Receiver Section.

£198.00 £66.06 DOWN & 18 Monthly Payments
of £7.33 INTEREST FREE

SPEAKERS

All prices quoted per pair

MODEL	PRICE	DEPOSIT	MONTHLY PAYMENTS
ACOUSTIC RESEARCH			
AR-16	£156.38	£62.34	12 of £8.67
AR-14	£227.25	£76.23	18 of £8.39
AR-11	£408.38	£138.38	18 of £15.00
AUDIO-MASTER			
IMAGE-2	£1119.90	£40.94	12 of £6.58
LS3/5A			
BBC MONITOR	£168.75	£56.79	12 of £9.33
MORDAUNT-SHORT			
CARNIVAL Ser II	£79.50	—	—
FESTIVAL Ser II	£99.00	—	—
PAGEANT Ser II	£157.50	£52.50	12 of £8.75
VIDEOTONE			
MINIMAX II	£49.50	—	—
SAPHIR I	£60.75	—	—
SAPHIR II	£60.75	—	—
MONITOR AUDIO			
MA-7	£98.91	—	—
MA 5 2	£155.25	£52.29	12 of £8.58
MA-4	£195.50	£65.54	12 of £10.83
MA 3/2	£400.50	£133.56	18 of £14.83
MA-1	£309.38	£103.46	18 of £11.44

THE
SUPERB

AIWA

HI-FI
EQUIPMENT

AIWA MUSIC CENTRES

AIWA AF-5080 '3 plus 1' MUSIC CENTRE
Brings together advanced technological design to create a perfectly matched Hi-Fi system. The front-loading cassette system and key controls are completely oil-damped to provide smooth operation every time. 'Dolby' noise reduction, quick cue review facilities, mechanical pause, three-step tape selector (LH, CrO, Fe Cr tapes) and digital tape counter complete the specification. The Record Player section consists of a semi-automatic 12" belt-drive turntable with magnetic cartridge. A unique feature of the AF-5080 is complete synchronisation between cassette and record player systems. The all-Silicon transistor stereo amplifier delivers 24 watts RMS per channel into 8 ohms. Through this the 4 wave-band radio (LW, MW, SW, VHF Stereo) allows the user to select any available station.

£383.00 £127.94 DOWN & 18 Monthly Payments
of £14.17 INTEREST FREE

AIWA AF-5050 MUSIC CENTRE

With a similar specification to the AF-5080, except for a 15 watts RMS per channel output. This unit is supplied complete with a pair of high quality bookshelf speakers, and represents exceptional value for money.

£379.35 £129.33 DOWN & 18 Monthly Payments
of £13.89 INTEREST FREE

CASSETTE DECKS



AD-6300

AIWA AD-6300 FRONT-LOADING

A beautifully designed front-loading cassette deck with a host of advanced design features for the enthusiast. Oil-damped cassette eject mechanism; full automatic tape stop; fast forward/cue and rewind/review facilities; instant tape pause; 3-step tape selector with independent bias and equalization selection. Signal/noise ratio 60dB (FeCr tape, Dolby on). Wow & flutter 0.09% WRMS

£175.00 £58.96 DOWN & 12 Monthly Payments
of £9.67 INTEREST FREE

MODEL	PRICE	DEPOSIT	MONTHLY PAYMENTS
AD-1250	£158.90	£53.90	12 of £8.75
AD-1300	£178.00	£60.04	12 of £9.83
AD-1600	£243.00	£81.00	18 of £9.00
AD-1800	£289.00	£98.94	18 of £10.67
AD-6300	£175.00	£58.96	12 of £9.67
AD-6500	£252.00	£84.06	18 of £9.33

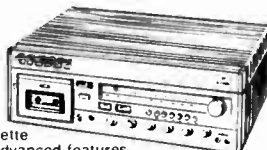


AD-1250

CASSETTE MUSIC CENTRE

AIWA AF-3080

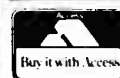
AM/FM Stereo Receiver giving 24 watts RMS per channel output into 8 ohms. Built-in 'Dolby' Cassette Deck with a host of advanced features.



£272.00 £92.00 DOWN & 18 Monthly Payments
of £10.00 INTEREST FREE

World Radio History

Dollonds



ALL PRICES INCLUDE

VAT AT 12 1/2%

Prices are correct at time of going to press

GOLDERS GREEN

610A Finchley Road, GOLDERS GREEN
NW11 Tel: 01-455 0672

WOOLWICH

45 Hare Street, WOOLWICH
SE18 Tel: 01-854 1955

AYLESBURY

59 Friars Square, AYLESBURY, BUCKS
HP20 2TB Tel: 0296 82498

USE THIS COUPON FOR FAST ATTENTION BY POST

Carr. & pkg: Music centres £4. Other items £3

PLEASE INCLUDE WITH ORDER

MAIL ORDERS TO 610A FINCHLEY ROAD,
GOLDERS GREEN, LONDON NW11

I WISH TO ORDER.....

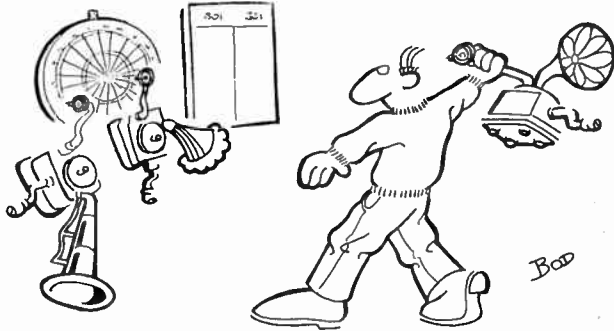
PLEASE QUOTE FOR.....

I ENCLOSE £..... DEPOSIT / FULL CASH Plus
Carr. & Pkg. I wish to repay the balance over 8 / 12 / 18 months

NAME.....

ADDRESS.....

HFN 7



Getting the Needle

Some gramophiles, particularly older readers, might well have occasionally wondered, especially in this centenary year, what had become of the firms who used to manufacture the trillions of gramophone needles used in acoustic gramophones and thrown away after very few plays. The British

Needle Company of Redditch who used to manufacture the 'Golden Pyramid' brand still exist, and surprisingly do even better now than in those 'golden' days—still making needles, even—not for gramophones, however, but for darts—the requirements for which are of course identical!



Pickering Turntables

Highgate Acoustics are bringing in a new range of Pickering turntables, which should be available this month. All are low profile belt drive models featuring Pickering's unique 'Gyropoise' suspension in which opposed magnets in the platter and the chassis cause the platter and spindle to float on air with the resultant decoupling eliminating vertical friction and ensuring good isolation from acoustic feedback. They all also feature the 'Unipoise' needle point tone arm with a premounted Pickering high compliance cartridge which, it is claimed, provides optimum filtering of unwanted mechanical vibration; Pickering quote a rumble figure of -55 dB and wow and flutter of 0.07%.

The FA230A semi-automatic turntable (with magnetic reed switching) and FA230M manual turntable, priced at £202 and £172 respectively, come equipped with an XSV/3000 cartridge, and the FA245M manual turntable, priced at £185, comes with

an XUV/4500-Q discrete quad cartridge. All prices plus VAT.

Spendor

As a result of the development work on the SA1, Spendor are making a change to the bass/mid drive unit of the BC1. This results in tighter bass performance, less coloured upper mid-range and significantly increased power handling capability of this unit, which will no doubt increase its appeal to rock aficionados. A price rise is also now imminent.

The Audio Amateur

Readers who would like regular copies of the quarterly *Audio Amateur* mag, mentioned by Eli Sammett in his April article, will be interested to learn that it can be obtained for £2.50 per year, from Yellow Oak Cottage, Tillington, nr Hereford HR4 8LQ.

Metrosound Move

As from July 1, Metrosound's new address will be 4-10 North Road, Islington, London N7.

Strathearn's Future

At a meeting for the Press and trade during the Heathrow show in April, Strathearn Audio's new executive Chairman Graham Bish—who took up this new post when Jim Shields, former MD of the company, quit in protest against this appointment—delivered a forthright message on the future of this State owned company.

Mr. Bish, a former ITT executive, has made some dramatic improvements in the factory owned by the Northern Ireland Development Agency at the Kennedy Way Industrial Estate, Belfast. Departments handling research, developments and quality control have been reassessed, and he plans that, in a few years, production will cover a range of 15 hi-fi, audio and video products.

Among the new products on the way are a second loudspeaker and a novel parallel tracking turntable/arm. Possibly an AM/FM receiver with touch-sensitive controls might join these items, the first prototypes of which will be seen at Harrogate in September.

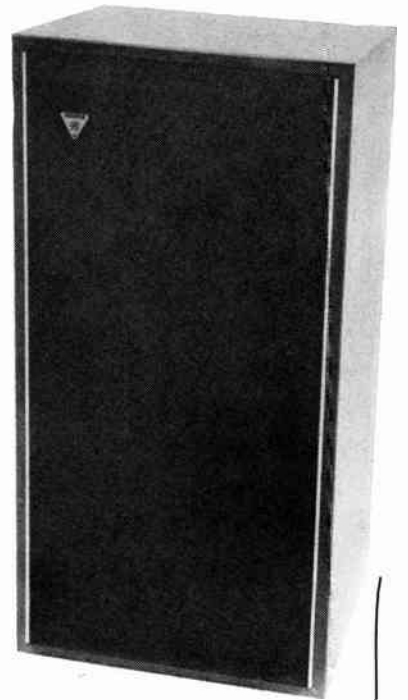
Mr. Bish told his audience that 'Somebody has to be number two to the Japanese, and that's what I want Strathearn to be'. He estimates that the present group of three turntables (including the STM4) and a loudspeaker will have a lifespan of only another 18 months before the new models are launched.

Crystal Clarity from Monitor Audio

In April I wrongly reported that the 45 r.p.m. direct cut Crystal Clear records were being distributed in the UK by Quadramail—information that I had been given by the progenitor of CC and Sound Advice, Ed Wodenjack himself, at the Paris AES. We are now informed that Monitor Audio will be handling the UK distribution. Nice one, Ed! (you now owe me two hamburgers when I get to S.F.). P.M.

Boffin on the Box

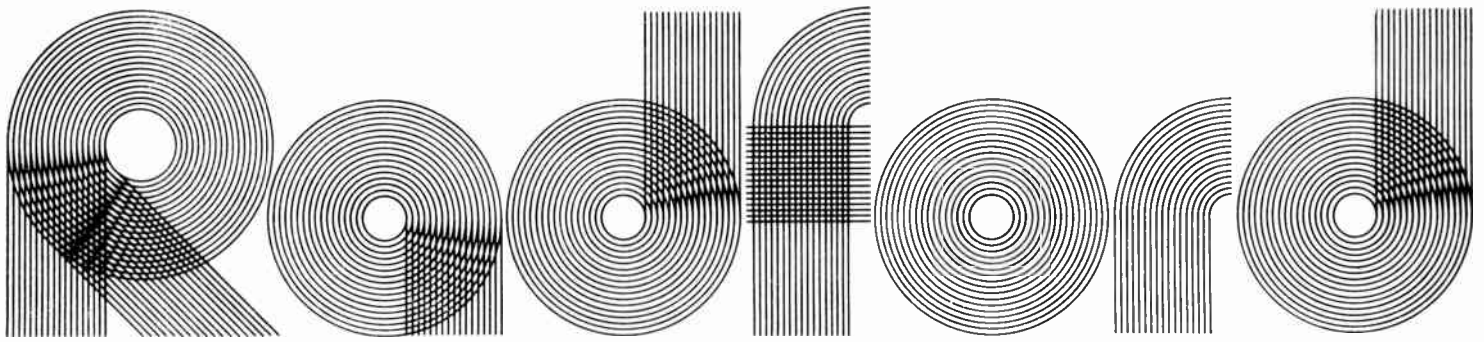
An Open University programme of special interest to hi-fi freaks is being broadcast this month. Unit 10 'Holography at work' of the course ST291 'Images and Information' features Dr. Peter Fryer from the Rank laboratory (see p. 51) demonstrating his holographic technique for investigating the behaviour of loudspeaker cones, one of the results of which was all those little rows of holes appearing in Leak and Wharfedale midrange drivers. By taking a



Griffin 27 'Aperiodic' loudspeaker

A new loudspeaker has been announced by the West Bromwich firm of H. K. Griffin Electronics, probably best known for their pricey tandem-bass-line tri-amped Griffin 85 monitor. The Griffin 27 'Aperiodic' is a reflex design using twin-angled damped pipes and has a crossover which, it is claimed, 'features degrees of inherent midrange and treble damping and coil control previously only obtainable by using tri-amplification'. The 27 'Aperiodic' has low distortion figures and is suitable for amplifiers from 30 W to 100 W RMS per channel output, and the impedance characteristic is claimed to be linear and almost entirely resistive. There are optional stands and price will be £198 plus VAT per mirror-imaged pair. Further details can be obtained from H. K. Griffin & Co. (Electronics), Sidons Factory Estate, Howard Street, West Bromwich, B70 0SU.

hologram (using laser light of wavelength λ) of the cone when driven, faults in the cone motion down to $\lambda/2$, i.e., about 300 Nm, can be observed when the resulting 3-D image is obtained by viewing the hologram in the light from the laser. The programme is being broadcast on BBC 2 at 07.30 on July 4 and repeated at 11.25 on July 16. Incidentally, Rank are very proud of the fact that Radio France has selected the Leak 3020 (the two-way one) for use as programme monitors, against eight other companies' products.



Celebration Sale

Offer open from July 11 -- July 25 1977 inclusive

RECORD DECKS

YAMAHA YP 400	57.00
YAMAHA YP 450	54.50
SANSUI SR 212	46.00
JVC JLA1	55.00
DUAL 1229	110.00

CASSETTE DECKS

TEAC A 160	90.00
TEAC A 260	145.00
TEAC A 360	175.00
TANDBERG TCD 310	165.00
HARMON KARDON HK 1000	150.00
TECHNICS RS263USD	85.00
TECHNICS RS279USD	178.00
PIONEER CT 5151s/h	65.00

RECEIVERS

YAMAHA CR 800	247.85
YAMAHA CR 1000	367.50
SANSUI 441	75.00
KLH 55	80.00

4 CHANNEL

TECHNICS SA 6800X	169.00
TECHNICS SA 6000X	140.00
TECHNICS SA 5400X	110.00
GOODMANS MODULE 90	110.00

shop soiled

AMPLIFIERS

ARMSTRONG 621	85.35
ROGERS RAVENSBROOK	52.00
ROGERS RAVENSBORNE	72.00
REVOX A78	160.00
REVOX A722	145.00
TECHNICS SU 3150	76.00
TRIO KA 8004	173.65
TRIO KA 8300	250.00
YAMAHA CA 400	80.00
YAMAHA CA 800	168.70

TUNERS

YAMAHA CT 600	131.80
YAMAHA CT 800	168.00
TECHNICS ST 3150	76.00
REVOX A 720	510.00

SPEAKERS

AIWA SC 25	<i>per pair</i>	60.00
ISOPHON	<i>per pair</i>	60.00
KLH 38 s/h		50.00
B & W DM 70 s/h		275.00
ROGERS BBC MONITORS with stands s/h		150.00
MONITOR AUDIO MA3/1		295.00
MONITOR AUDIO MA3/1 s/h		200.00

HEADPHONES

WHARFDALE		
ISODYNAMICS	<i>shop soiled</i>	15.50

MEMOREX TAPES 10" METAL REEL

1 off	each	6.00
5 off	each	5.50
10 off	each	5.00

TAPE DECKS

REVOX 11104/2	395.00
REVOX 11106/8	450.00

ABOVE ITEMS ARE FOR CASH ONLY

PRICES INCLUDE VAT.

SECURICOR DELIVERY £2.50

OTHER CHOICES FROM

ACOUSTIC RESEARCH	GALE	MAYWARE	SPENDOR
ADC	GRACE	MAXELL	STUDIOCRAFT
AGFA	HARMON KARDON	MONITOR AUDIO	SANSUI
AIWA	IMF	NAKAMICHI	TDK
AKG	J.E. SUGDEN	NIGHTINGALE	TASCAM
A & R CAMBRIDGE	JVC	ORTOFON	TECHNICS
AUDIO-TECHNICA	JR	PIONEER	TRIO
BOSE	KEF	QUAD	TANGENT
PROFESSIONAL BOSE	KLH	REVOX	TANNOY
CELESTION	LECSON	ROGERS	UHER
CHARTWELL	LINN-SONDEK	SENNHEISER	ULTIMO
DUAL	LUX	SHURE	VIDEOTONE
EMPIRE	MICHELL	SME	WATTS
FERROGRAPH	MICRO ACOUSTIC	STAX	WHARFDALE
FONS	MICRO	SUPEX	ZEROSTAT

Free Headphones Offer

You will receive a FREE pair of Beyer DT440 Headphones with every order over £200.00

OR you may take an additional 5% off our normal Discount price.

This offer does not apply to above Sale

Telephone for favourable quote

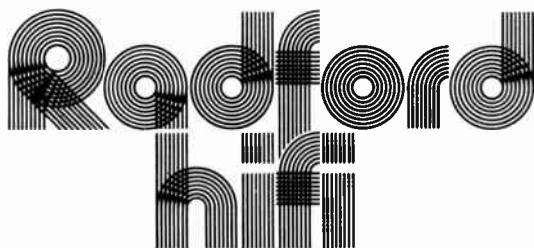
Advice write or telephone

Export to most parts of the world

Mail Order

Credit Cards

H.P.



Radford HiFi Limited, 52/54 Gloucester Road, Bristol. BS7 8BH
Tel: (0272) 422709/44593 Telex: 449315

Order By Post

PLEASE SUPPLY (make + model No.)

(cheque/P.O.)

I ENCLOSE £

NAME

ADDRESS

54 Gloucester Rd
Bristol
BS7 8BH

Audio Patents Adrian Hope

HORNS are now seldom used for hi-fi reproduction, especially in the lower frequency range. Although many would cite colouration as the reason, Onkyo Kabushiki Kaisha, of Japan, in BP1 463 192, suggest that it is due largely to considerations of size and excessive directionality.

The Japanese claim that an improvement over existing systems can be achieved by a complicated geometrical arrangement which involves dividing the horn aperture into two separate sound channels, both running more or less parallel to each other from the diaphragm to the mouth, but each having a differently varying shape along its length. Thus, although the horn mouth looks like a letterbox equally divided into two rectangles the two separate sound paths to that mouth each have a changing, non-rectangular shape along their length. This is achieved by curving the walls of the two sound passages to a varying extent along their lengths. It follows that sound waves projected into the passages by the driver diaphragm travel a variety of different distances through different virtual

passage portions. It follows that the propagation time taken for the sound wave to travel through some portions is longer than others, and the apparent velocity of sound at the mouth plane differs in accordance with the position in the mouth from which the sound wave is radiated. This, in turn, is claimed to produce a greater spread of sound from the horn mouth, with better low frequency reproduction as a result of slightly different impedance characteristics at different passage portions. The polar response looks impressive but this is certainly one invention where the proof of the pudding must be in the hearing.

British and American patents have now been issued on the loudspeaker system invented by Laurence Latimer-Sayer, of Twickenham, and briefly marketed by Omal. The British version carries the number BP1 446 846. The object of the Latimer-Sayer design is to enable the characteristics of a loudspeaker to be tailored to the acoustics of the room in which it is used. A large-volume cabinet has its interior space partitioned into four sub-cabinets, each interconnected by a

vent to define a folded transmission line. This line tapers and terminates at a port in the front panel. The invention consists in providing a gauged pair of control flaps, one in the vent interconnecting the last two sections of the transmission line and the other over another port in the cabinet bottom. Together the flaps can both seal off the last section of the transmission line and open the port in the cabinet bottom. In this way the four-section transmission line and end port is converted into a three-section and thus shorter transmission line and end port. In one cabinet design the maximum length of the line is approximately one quarter the free space resonant wavelength of the drive unit: in a smaller version the length is one eighth the wavelength. The inventor's claim is that by altering the flap position the user can vary the amplitude of frequencies between about 50 Hz and 200 Hz, shift the resonant frequency of the unit and alter its Q, so as to cater not only for different rooms but also room positions, for instance room corner or room middle.

News

Percy Wilson

Dogged by indifferent health in recent years, Percy Wilson, one of the great pioneers in the world of sound recording and reproduction, died in Oxford on April 30 at the age of 84.

Born in Halifax, he obtained a scholarship at Heath Grammar School and went on to Queen's College Oxford, where he took a Double First in Mathematics. After serving as a Naval Instructor in HMS Dreadnought, he became Lecturer in Applied Mathematics at the Royal Naval College, Keyham, 1918-1919. He moved to the Board of Education in 1919, and became Principal Assistant Secretary in the Roads Department at the Ministry of Transport from 1938 to 1949, retiring in the latter year. While at the Ministry, it fell to him to write the first *Highway Code*!

Concurrent with this important career as a civil servant, PW—as he came to be known—developed his interest in audio engineering, contributing his first article on 'needle track alignment' in 1924 to the then new magazine *The Gramophone*, founded by Compton Mackenzie, with Christopher Stone as London Editor. These articles on the mathematical treatment of minimum pickup arm tracking error (or rather a sound-box and tone-arm in those days) were an important advance and fascinated gramophiles. His next

major investigation concerned the acoustic properties of horns, leading on to calculations for the optimum shape of exponential horns. Later he adapted his horn designs for domestic use, including an 8 ft. straight horn suspended by pulleys from the ceiling



in his hallway, which, when lowered, had an open square end that exactly slotted into the upper part of the doorway of his lounge.

PW became *The Gramophone's* technical adviser until 1938, and then its Technical Editor from 1953 until 1966. His other activities included work for the Schools Broadcasting Council and, what he regarded as one of his most rewarding adventures, the making of Talking Books for the Blind.

His last significant work concerned record cleaning techniques.

Among his many academic attainments and appointments, PW became President of the British Section of the Audio Engineering Society, and was the second Briton to receive the Annual Citation of the AES in 1966. He helped in the early years with the expansion of the British Sound Recording Association, formed in 1936.

Author of two important books, *Modern Gramophones and Electrical Reproducers* (with G. W. Webb in 1929) and *The Gramophone Handbook* (1957), the interests of this polymath author extended to the Spiritualist Movement, in which he became active during the Second World War. He established the Spiritual Truth Foundation to control the weekly newspaper *Psychic News*, of which he became Chairman of the board of directors.

What of PW the man? Three times married, progenitor of distinguished academic sons, he was always a strong personality, with a prodigious memory. Not given to suffering fools gladly, arrogant at times but always pontificating with a Puckish sense of Yorkshire humour, PW was experimenting sonically when the 'real hi-fi' was a gleam in Paul Voigt's eye and merely sounds in the infant Peter Walker's mind. The audio scene will never be quite the same now that Percy Wilson has gone. D.A.

Digital Errors

In our April report on Donald Reid's AES lecture on Digital High Quality Audio Signals, we inadvertently made a few errors and would like to thank Donald Reid for pointing them out.

(a) The BBC's PCM system uses a bit rate of 6.336 Mbits/sec rather than 3.66 Mbits/sec.

(b) Near-instantaneous digital companding offers 9 dB better S/N ratio than 'A' law instantaneous digital companding at high signal levels.

(c) 10 bits/sample near-instantaneous digital companding is virtually indistinguishable from 13 bits/sample pcm. 7 bits/sample near-instantaneous digital companding is not broadcast quality.

(d) Dual-slope ramp analogue-to-digital converters are not necessarily better than single-slope converters, but in many ways they are more easily instrumented. The dual-slope converters use a clock frequency of about 12 MHz. The corresponding single-slope converter would require a clock frequency of at least 262 MHz.

TV Sound Isolator Again

Readers who have experienced low level output from their TV sound isolator circuit described in April HFN should change R4 to 4.7 kΩ.

Equivalent opto-isolators for IC1 are TIL111, TIL112 and the transistor is not critical either, a BC319 would also be suitable.

TECHNICAL BREAKTHROUGH

JR Loudspeakers Model 149.

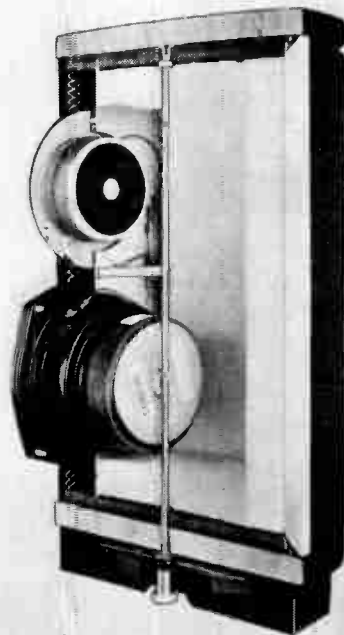
Jim Rogers, one of Britain's leading hi-fi technologists, has produced an outstanding design for a loudspeaker which entirely does away with the various problems of flat panel cabinets.

The resonances and colourations of box cabinets, with their three sets of flat parallel surfaces, are still all too obvious, despite the introduction of various damping techniques and the use of internal partitions.

The new JR149 system has an enclosure of heavy gauge aluminium in a near cylindrical shape, giving it enormous advantages over the conventional rectangular box. The shape is extremely resistant to vibrations. Standing waves from varying lengths of reflection are of low amplitude and these are damped by a thick layer of acoustic absorbing foam which lines the whole of the inside. The lining also reduces radiation from the cylinder's walls.

Each end of the cylinder is fitted with a low resonant fibre disc made slightly concave by the tension of an internal fixing steel rod which further inhibits panel resonance.

The radical design of these new loudspeakers allows for exceptional reproduction without the slightest hint of the small size of the unit. At last, high performance and small size have been combined - a real breakthrough in speaker technology.



JR Loudspeakers, 114 Ashley Road, St. Albans,
Herts. AL1 5JR. Tel: St. Albans 64337. Telex: 28474

Please send me full colour leaflet giving technical specification and illustrating various reproduction antique and modern finishes.

Name _____

Address _____

Record Player Roundup

Martin Colloms

I have recently completed a major test programme for the *Hi-Fi Choice* series on the subject of turntable systems, which included separate arms and turntables together with pickup cartridges. The quantity of products analysed was appreciable: 55 turntables ranging in price from £30 to £900 were assessed, together with 40 cartridges (including moving coil types) costing between £5 and £85 and, finally, 6 motor units and 7 pickup arms (£15-£200).

Although hi-fi reviewing is my business I am indebted to *Hi-Fi Choice* for requesting me to undertake the project, as it enabled me to carry out many revealing tests on record playing equipment, some of which had not been used in published work before. The report proved to be an education in itself, and I hope it will add considerable factual weight to the serious but normally limited investigation of subjective sound quality.

Turntable coloration

While I, together with a number of hi-fi colleagues, had become aware of certain criticisms concerning high quality record playing systems, it is one thing to set up a comparative demonstration of a couple of decks, and quite another to establish lengthy referenced comparisons of over 60 models under controlled conditions. The former test method has recently given rise to the generalisation that 'belt drives are good, and direct drives are bad'. While there is an element of truth in this statement, it fails to grasp the essential reason underlying the difference in quality.

It turns out that the majority of the better belt driven decks incorporate a structural feature known as a 'spring suspended sub-chassis'. With these models, the record playing components (arm and platter) are suspended independently of both the plinth proper and the vibration-inducing motor. In contrast, the direct drive deck possesses an almost vibrationless motor, and at first sight it does not appear to need the isolation of a sprung chassis. Hence, most of these models are solid, bolted-together designs mounted on rubber feet described as 'shock absorbing'.

However, we found that the major differences in sound quality could be attributed almost without exception to the different forms of plinth and chassis construction,

and not to the type of motor. It is thus theoretically possible for a direct drive turntable to offer a high standard of subjective performance, although it must be admitted that there are few such examples at present.

The 'average' sound quality at the bass and lower-mid frequencies of a conventional turntable design with rigid construction can frequently be transformed by relocation. Installing it as far from the loudspeakers as possible on a substantial shelf bolted into a structural wall may considerably improve the subjective performance when compared to the more usual position on a flimsy cabinet close to the speakers.

Where an unfortunate combination of turntable and location is thus remedied, the sound quality may improve in several respects. The low frequency range may appear to extend deeper with less boom or overhang in the upper bass. Likewise, the low mid-range coloration, noticeable on male voice or as a confusion of orchestral instruments, may be considerably reduced.

Compatibility

One of the project's aims was to try to tie down the vague and ill-defined area of arm/cartridge compatibility. While arm coloration and its possible interaction with various types of cartridge was kept in mind, the main question concerned the working resonant frequency of the arm/cartridge combination. With the present state of arm and cartridge development, the figure of 10 Hz was decided upon as the objective; this lies about an octave below the lowest audible frequency and nearly an octave above the greatest record warp disturbance frequencies. The latter impair trackability as well as other aspects of cartridge performance. A secondary factor concerned the 'Q' or lack of control at the arm/cartridge resonance. The latter should preferably be adequately damped, although this may prove difficult to arrange, as few arms have any provision for damping.

With this standard in mind, an oft-suspected failing was confirmed; namely that most cartridges are incompatible with the majority of pickup arms. One famous manufacturer suggested that the arm fitted to one of their turntables would work well with any cartridge, in particular the Shure V15; however, the total effective moving mass of this combination exceeded 25 grams, resulting in a subsonic resonance

below 5 Hz—quite unacceptable for optimum cartridge performance.

As many users will no doubt be quick to point out, such a combination can play records, as the stylus can be shown to follow the groove spiral. However, the vital point here is not whether the chosen arm and cartridge will work at all, but how well they work together!

Several research papers have shown that the subsonic arm/cartridge resonance should be damped, the ideal position being at the arm pivots rather than (the alternative solution) incorporated in the moving system of the cartridge itself. Effective low frequency cartridge damping usually results in performance compromises elsewhere in the range, and consequently the finer models are generally poorly damped at low frequencies. Arm designers seem to have shut their eyes to the importance of damping, and continue to produce undamped models. At present barely a handful of designs exist which incorporate damping, and these specialist types are rarely supplied as part of a ready-assembled turntable system.

Finally, one last aspect of compatibility deserves a mention, namely the electrical loading which produces the optimum measured and subjective results from a given cartridge. This loading usually consists of a parallel combination of capacitance and resistance presented by the pickup leads and the characteristics of the matching amplifier input. Generally, modern amplifiers and turntables together offer a loading of 47 k-ohms with approximately 150 pF, and yet a number of cartridges do not give of their best unless this loading is modified by additional components. Several examples in the report required 47 k-ohms, 400-500 pF, and in one case 22 k-ohm, 500-600 pF, resulted in a highly accurate performance from the cartridge.

Overall the test results show that, despite well-known information concerning arm/cartridge compatibility, acoustic resonance/vibration isolation in turntables and amplifier/cartridge matching, the majority of manufacturers seem to have paid very little attention to these points. Clearly, the intending purchaser must take great care to ensure good matching, otherwise the true potential of the resulting system components will never be fully realised. ●

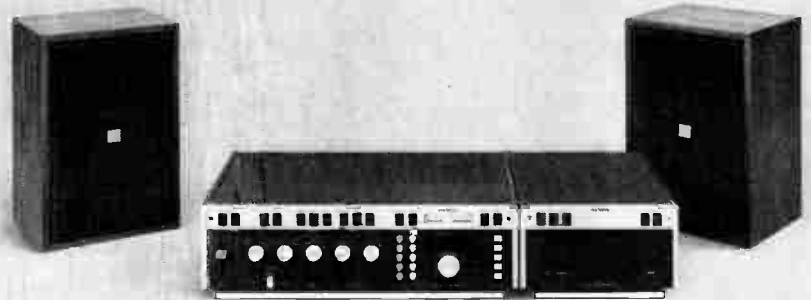


Revox A700 Stereo Tape Recorder

The 'big machine' from Revox which bridges the gap between top ranking amateur recorders and full-blown professional studio equipment.

Two separately adjustable stereo channels with a total of 4 inputs are available, and large VU-meters with additional fast responding peak level indicators make accurate modulation control an easy task. Step-type tone controls for listening via headphones or with a remote switchable power amplifier, built-in phono pre-amplification for magnetic pick-ups and other features, such as stereo echo and variable tape speed (via an accessory unit) open up entirely new possibilities. All this makes the A700 suitable, not only for serious recording work, but also for the audiophile, with high standards of technical quality and operating convenience.

These and the many other outstanding features built into this unique equipment make the A700 probably the finest recorder on the market today. Your Revox dealer can arrange for a demonstration or you can send the coupon for full information on the A700.



Please send me detailed information on the Revox A700 recorder and on the full range of Revox hi-fi equipment.

Name _____

Address _____

Sole UK Distributor: F. W. O. Bauch Ltd.,
49 Theobald Street, Boreham Wood, Herts. WD6 4RZ

STUDER REVOX HFN7.77

Books

HI-FI CHOICE No. 4: CASSETTE DECKS AND TAPES by Angus McKenzie. 170 pages, photos, tables. Price £1.50. Published by *Aquarius Books*, 26 Parkway, London NW1.

THE SEQUEL to Angus McKenzie's Cassette Deck review book is now available, albeit at a higher price than hitherto. Nevertheless, this is still the buyer's bible, and is a worthwhile substitute for the unfortunately rare good retailer.

Obsolete models have been omitted in this revision. Some 34 new machines and revised reports on continuing models are included, plus a new and very comprehensive survey on the different tapes available. If you're a cassette user it's probably worth buying for this section alone—a wrong choice of cassette could cost you the price of the book. In short, just about everything anyone would want to know about cassettes and cassette machines, and right up to date, lucidly explained in Angus' slightly abrasive style. One serious complaint is that the pages were trimmed badly so that last and first words in a line disappear into the binding, which is thoroughly exasperating.

Paul Messenger

MASTER STEREO CASSETTE RECORDING by I. R. Sinclair. 107 pages, plus index. Price, £2.50. Published by *Newnes Technical Books, The Butterworth Group*, 88 Kingsway, London WC2B 6AB.

IN THE LAST couple of years the Butterworth Group has commissioned a series of elementary books on hi-fi and recording topics, published under their 'Master' heading. Having seen several of these texts one must admire the lucid presentation, clear typography, perspective type illustrations by Bob Scott, and the straightforward approach of the writing.

With the growing interest today in tape recording, especially with the cheap, simple-to-operate cassette machines, there is a place for a basic book explaining the principles and practice of stereo cassette recording.

Ian Sinclair in his opening chapter discusses the magnetic recording principles involved, and their application to tape recorders, going on to signal sources (microphones, radio and disc), followed by sections on making the recording (a useful explanation of DIN connections is included here), leading to replaying and monitoring, involving loudspeaker phasing, headphones, etc.

Chapters 6 and 7 tackle essential maintenance and what are referred to as 'aids for better recording', such accessories as test cassettes, disc cleaning devices, using tape splicers, and so on. Under Noise Reduction Systems, Dolby and Philips DNL circuits are explained, but no direct reference is made to the dbx system, which quality enthusiasts will wish to know about.

The last section deals with discs and the tape medium in relation to the real hi-fi. Certainly refinements in stereo cassette mechanics and circuitry, linked to improved tapes, have upgraded the best domestic tape recorders into the high fidelity category. The book closes with an explanation of the techni-

cal terms used in specifications for such recorders as the Nakamichi Tri-Tracer 700, Harman-Kardon HK1000, Sansui SC737, Tandberg 310, and the Sony TC177SD.

If you have recently acquired a cassette tape recorder and want to know how to get the best performance from it, this book will put you on the right path.

Donald Aldous

THE UNANSWERED QUESTION by Leonard Bernstein. Six talks at Harvard—the 1973 Charles Eliot Morton Lectures presented in book form, with three 7 in. 33 $\frac{1}{3}$ rpm discs (HUP 1000/1100/1200) carrying 37 musical excerpts to support the text. 428 pages, numerous musical examples, several half-tone pictures of the author. Hard cover, in box with records, price £12.75. Published by *Harvard University Press*, 126 Buckingham Palace Road, London SW1W 9SD.

NOT UNEXPECTEDLY, this book has most of the qualities of a Bernstein performance: excitement, exaggeration, untidiness, enthusiasm, inconsistency, explicitness, also a whiff of exacerbation and untruth. These lectures, an exploration of tonal music in relationship to language, were also videotaped and committed to LP records, after the original Harvard talks; the printed text is somewhat edited, but preserves the flavour of speech. Ideally one needs a pianoforte to explore the music examples—of these only essential excerpts have been cut on the accompanying discs. These are irritatingly poor in layout and quality, dogged by echoes: Bernstein's voice in a hall of mirrors! I found it best to assimilate the text, then go through the records separately.

Although the final lecture is markedly weak—a eulogy on Stravinsky, the 'encyclopaedist of misalliances', stopping short of his atonal period—Bernstein's earlier lectures threw up many arresting and brilliant concepts. *Tristan* as a metaphor of Berlioz's *Romeo*. Beethoven's *Pastoral* as an essay on the interval F-C. The universal child's taunt 'Cowardly cowardly custard...' is demonstrated as tonally ambiguous (F major/A minor?), thus teasing; Debussy's *Faun* is a masterpiece of poetic ambiguity. Mahler's ninth symphony is proposed as a prophetic statement, that the 20th century would be uniquely confronted with *death*. It is a pity that Bernstein's initial promises, to show that music had developed as a universal language, obeying principles of deletion, metaphor, and subject to analysis paralleled by Noam Chomsky's deep structures, are not developed without inconsistencies. Or that 'The Unanswered Question'—whether new music—is unsatisfactorily resolved.

One should not take Bernstein's theses as 'unquestioned answers'. Rather, this is a volume to delve into for disparate ideas. If nothing else, it contains the most easily grasped demonstration of the physical laws of sound/tonality I have encountered. One cannot read Bernstein without gaining a wider awareness of music, without having one's listening habits challenged, or even one's habits of self expression.

Judged purely in terms of presentation, this HUP exercise is very satisfying. Layouts, type-faces, paper, and horizontal format adopted are all excellent, although the photographs have a curiously dead look about them. I found only two minor misprints.

Christopher Breunig

BRITISH MUSIC HALL: an Illustrated Who's Who from 1850 to the Present Day by Roy Busby. 191 pages, over 200 illustrations. Price £12.50. Published by *Paul Elek Limited*, 54/58 Caledonian Road, London N1 9RN.

MUSIC-HALL, in common with Victorian songs, Ragtime and Fred Astaire, is now accepted as a subject of sufficient antiquity to be spoken of and read about in the most intellectual, academic and generally well-bred circles. What was once working-class fare of the lowest brow is now a focus of gentle nostalgia for the good old days, family fare; far more glamorously presented than the original on BBC television; the subject of learned discourse on the radio. Publishers, aware of its appeal, have called upon those with a collector's knowledge of the subject to provide an adequate bibliography and recent years have seen quite a spate of books, histories, scrapbooks and collections of songs. Illustrated sheet-music has become a field for the wealthy collector. But no-one up to now has attempted a proper Who's Who, except for a curiously selective volume published in 1950 which even the British Museum didn't know about.

Now, Roy Busby, building on the foundation of that book and amply filling in the gaps, comes along with this lavishly illustrated biographical dictionary. All music-hall enthusiasts will certainly welcome it and I trust they will be charitable enough (though I doubt it, knowing them) to understand that where Mr. Busby fails to provide detailed information (dates, etc.) those details were almost certainly obstinately unobtainable. Much of the history of music hall and popular song has disappeared into publisher's dustbins and died with its personalities. More pieces will eventually be re-assembled, but only when someone supports some research into these lighter fields as they do for almost any crackpot and obscure academic venture in the 'serious' areas of music.

Mr. Busby has done exceedingly well and cast his net extremely wide, even to cover names that most people will never have heard of today. It's a lovely volume to ramble through as well as a serviceable reference book. The publishers have found it impracticable to use all the colourful and historical material that the author had in his possession (which I happen to have seen) and have mainly restricted themselves to black and white photographs; but, costs being what they are, we can't have everything. I'm very glad to have this book around.

Peter Gammond

Also Received

TCHAIKOVSKY by Edward Garden (£1.95), **MUSSORGSKY** by M. D. Calvocoressi (£2.50), **BIZET** by Winton Dean (£2.95). Paperback versions of books in *The Master Musicians* series; originals reviewed in HFN/RR in, respectively, August 1973, September 1974, August 1976. Published by *J. M. Dent & Sons Ltd.*, Aldine House, 26 Albemarle Street, London W1X 4QY.

ASPECTS OF TONE SENSATION by Reinier Plomp. A psycho-physical study at an academic level, concerning hearing in relation to combination tones, consonance, dissonance, and the loudness, timbre and pitch of complex tones. 107pp plus ix, 58 illustrations, references and indices. Hard cover, price £6.50. Published by *Academic Press Inc. (London) Ltd.*, 24/28 Oval Road, London NW1 7DX.

THE AWARD WINNER

The Sixth Japan Stereo Components Grand Prix Committee has presented a citation to Zerostat Instruments Ltd manufacturers of the Zerostat Anti-Static Pistol.

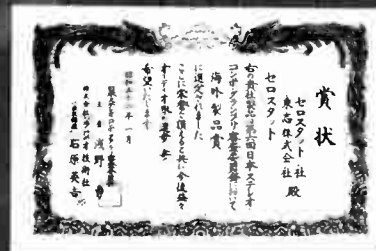
This award recognises Zerostat's unique contribution to the alleviation of the problems caused by static charge on gramophone records.

Zerostat

This product of your company has been chosen as one of the top products in the Foreign Products Division by the Selection Committee of the Sixth Japan Stereo Components Grand Prix.

We congratulate you for the high honour, and hope you will continue to make contributions towards the development of the audio world.

*Isamu Asano, Chairman
Japan Stereo Components Grand Prix Selection Committee
Eikichi Ishihara, Representative Director
Radio Technique Ltd.
January 1977*



The Zerostat pistol is available from Hi-Fi and record shops and large stores price £6.99 inc. VAT.

Department, B
Zerostat Instruments Limited,
Edison Road, Industrial Estate,
St. Ives, Huntingdon, Cambs
Telephone St. Ives (0480) 62225

ZEROSTAT

Soundings

Donald Aldous

EVEN without access to statistics or trade magazines, anyone interested in the hi-fi world must have noticed in the last year the closing of many hi-fi stores around the country, some merging with bigger companies in the electrical field—particularly TV rental companies, an area that has grown spectacularly in the last few years—or just fading quietly from the local scene.

Talk to the former owners, or staff made redundant by these closures, and you will hear many reasons for this unhappy state of affairs, ranging from the country's inflationary economy, to inability to compete with the discount houses. Even those hi-fi specialists still running a successful business admit that it can be tough going, and some are diversifying into public address installations, discotheque systems and, when the know-how and personnel are available, into recording work and educational installations.

Ruminating on the passing of some small hi-fi dealers, the letters that have been reaching me and this magazine through our very large mail reflect the inability of many would-be hi-fi consumers to obtain helpful information now that many specialist shops have gone. Fortunately, in the UK there are a number of reputable hi-fi magazines from which the enthusiast can acquire advice and—in some instances—a personal reply to letters with technical queries. In the light of present conditions, this advice service can only become more significant to the audio industry. Certainly, we on HFN/RR will continue to do our best to help readers involved in the exciting world of high fidelity sound.

Mention of economic problems brings me to another topic cropping up in many recent letters: DIY kits for the audiophile anxious to save money on his hi-fi system. Although I know that KEF have discontinued a couple of Kefkits, home assembly loudspeaker systems can still be bought from several sources and represent major savings for the enthusiast. I must say that the range available from Richard Allan has greatly impressed me, and other products that can be obtained for the DIY man include ready-to-assemble turntable kits from Connoisseur, the BD1 for example, and if you have basic soldering skills the Heathkit FM stereo tuners and receivers could be tackled.

If your technical knowledge is of a more advanced standard, you may wish to attempt some of the constructional designs that appear in these pages, or in various books now on the market. One such book has come my way from Bernards (Publishers) Ltd., The Grampians, Shepherds Bush Road, London, W6 7NF. Called *50 Projects Using IC CA3130*, it's a paper-back of 96 pages giving circuits for an entire range of audio, RF, test-equipment, household and miscellaneous projects, all employing the RCA CA3130 operational amplifier IC. Price is 95p.

One parameter in which several well-

known op. amp. ICs fall short of their theoretical perfection is that of input impedance. Bipolar transistors have a relatively low input impedance, and this represents a shortcoming for the input circuits of most op. amps.

The CA3130 from RCA is manufactured using new techniques that allow the FET input stage and the main bipolar circuitry to be housed in a single chip, which makes the product far less expensive than two-chip ICs. It uses a CMOS (complementary metal oxide semiconductor) input stage, with a voltage gain of only about five times. This is followed by two bipolar amplifying stages, the first having a voltage gain of 6,000, while the second is a Class-A output stage with a voltage gain of about 30 times. Some op. amps have internal compensation components (to reduce the upper frequency response and prevent it from going unstable), but the CA3130 IC uses only a single capacitor to provide the necessary frequency compensation. There are several versions of this IC, but the CA3130 is contained in a TO 58 lead metal encapsulation.

Incidentally, Philips hi-fi kits are big sellers in Europe and the range is now available (including mixers, amplifiers, loudspeakers, etc. for home assembly) in the UK from S.S.T. Distributors (Electronic Components) Ltd., West Road, Tottenham, London, N17 0RN, who will supply a free colour catalogue.

For the moment I won't enter into a discussion of the pros and cons of thermionic valve versus transistorised amplifiers, but some research undertaken by *AudioScene/Canada's* Audiolabs has resulted in some interesting findings about the so-called subtle differences between amplifiers which make the hi-fi customers in some stores rave about the 'open quality' of one model against the 'muddy' sound of another, attributing the differences to design variations.

The tests have revealed that in many instances the major differences were caused not by the amplifiers themselves, but by the circuitry in the A-B switching equipment! It seems logical that amplifiers measuring the same should sound the same, but manufacturers and customers often claim their models have audible superiority without any apparent reason.

Using a specially designed comparator, listening comparisons revealed differences in spectral balance, so checks were run on each amplifier, first separately and then connected to the comparator. The results were quite different. By making certain design modifications in the switching unit, the device was made neutral and then the apparent differences between amplifiers disappeared.

Investigation of the problem revealed that the major snag was the use of chassis earthing in both input and output sections of the comparator. If the two earths are connected together, a signal can leak back into the

input and disrupt the 'flatness' of the amplifier response, often with quite large irregularities, according to the amplifier design. It was also found that another factor which can affect amplifier response is the impedance of the controls used to match levels between the amplifiers under test. If it is too high, then it couples with the various cable capacitances to form a sort of tone control, rolling off the high frequency end. The more the level is reduced on the amplifier, the more the top-end rolls off.

Audiolab believe that if a listener can detect major differences between amplifiers—using the same source and driving the same load at the same level—there is some other factor influencing the signal.

I'd be surprised if all the audio and record enthusiasts who take for granted the fine music quality from the BBC network of transmitters (or at least the best of them in the UK) and the 19 commercial radio stations, know the absorbing story of Major Edwin Howard Armstrong, the American engineer whose sustained efforts to get his FM technique accepted in the USA from 1933 onwards, and so make practicable the hi-fi radio quality we can get today in many locations. The Armstrong story is brilliantly written up in Lawrence Lessing's 272 page paperback entitled *Man of High Fidelity*. Engineers will know of his contributions to two early basic circuits—the regenerative or feedback circuit and the superheterodyne—but, as a foreword note to this book comments, in this time of mushrooming industry and mammoth corporations the recognition of individual genius is often refused, and always minimised.

I'm afraid this story of the work and tribulations of Armstrong has a tragic end, as he committed suicide in 1954, but if you want a stimulating portrait of a controversial personality in the world of hi-fi radio, this is the book to get now for yourself or as a present. It is not available from UK bookshops, but costs only 1 dollar, 50 cents, including postage, direct from The Armstrong Memorial Research Foundation, 510 Seeley W. Mudd Building, Columbia University, New York, NY 10027.

If you are on holiday this summer in the West country, I commend to you a visit to the West Cornwall Museum of Mechanical Music, at Goldsithney, Penzance, Cornwall. Founded in 1972 by Douglas Berryman, its open season runs from mid-April until the end of September. The restored instruments (including musical boxes, player pianos, mechanical pianos, self-acting organs, café pianos and orchestrions, mechanical violins, a collection of phonographs, and, most recently, a fine batch of early crystal and valve radio receivers) are demonstrated daily during conducted tours. Around midday on July 7th a 30-minute TV documentary will be shown over the ITV network illustrating some of the work of this museum.

"I always believed biggest was best - but then I met DAVID"

If you are looking for vast expanses of oak veneer and black vynair, the VISONIK® DAVID range has little to offer. If, however, your requirements are faithful sound reproduction and unobtrusive size – then loudspeakers from the VISONIK® DAVID range must be an obvious choice for the following reasons:

1. A special resin formulation and a special plastic reduce colouration to a minimum, whilst offering a finish highly resistant to damage.
2. Very high sound output levels can be produced from these incredibly compact units and models are available to handle continuous power outputs of 30, 50, 60, 80 and 100 Watts. DAVID 30 measures a mere 170mm x 103mm x 107mm., whilst even the DAVID 100 measures only 360mm x 225mm x 225mm.
3. The concept of high output loudspeakers in attractive but strong, ultra-compact, enclosures results in the VISONIK® DAVID range being suitable for all applications from in-car stereo systems to 100W studio monitoring.

By the way, VISONIK® DAVID loudspeakers are guaranteed for a full five years.

Distributed in the U.K. by:
Uher Limited, 28 Spencer Street,
St. Albans, Herts. AL3 5EG
Tel. St. Albans 30236/7

VISONIK® is the registered trademark of the H. Dahl group.

World Radio History

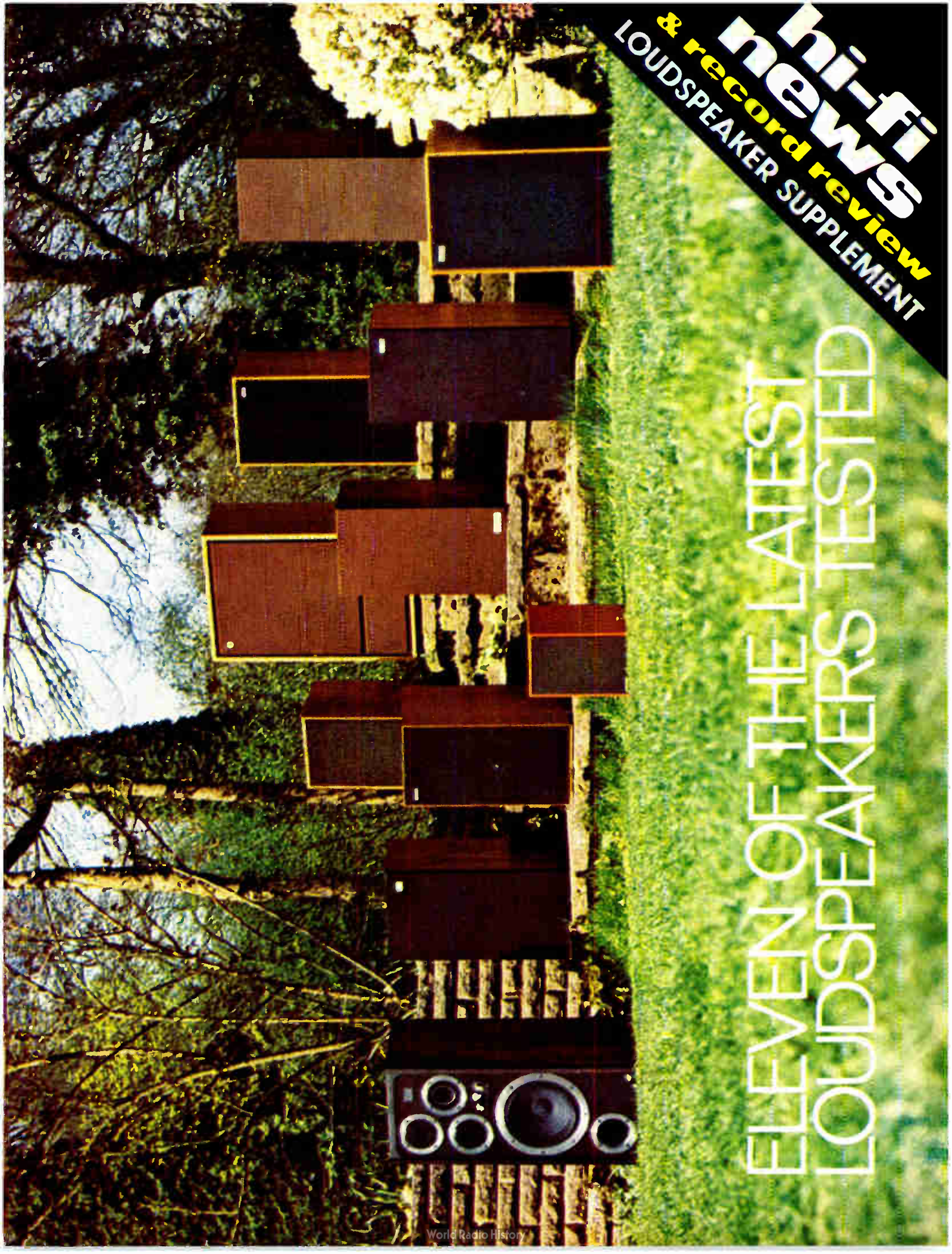
I would like to meet DAVID, please send me more information

Name _____
Address _____

HFN

hi-fi
news
& **record review**
LOUDSPEAKER SUPPLEMENT

ELEVEN OF THE LATEST LOUDSPEAKERS TESTED

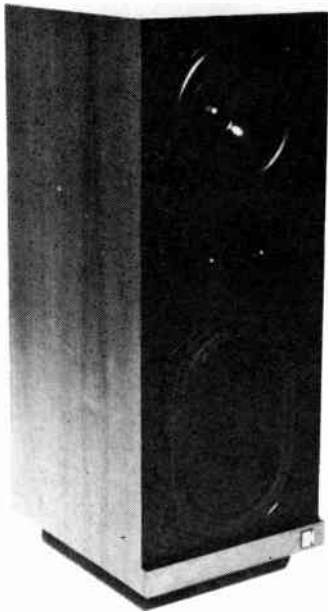


Loudspeaker Supplement

LOUDSPEAKER reviewing is one of the most contentious areas of hi-fi; indeed the reasons for *not* doing it were the subject of the May editorial in our sister magazine *Studio Sound!* Nevertheless, both readers and manufacturers are anxious for us to review the latest products, and consequently we are obliged to do our best while pointing out the relevant reservations and qualifications.

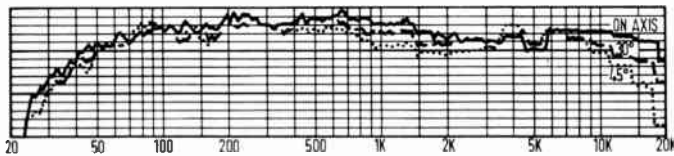
The objective tests are well-known and closely specified, but it is common knowledge that they only provide indicators of performance and can be misleading, while nevertheless being extremely useful. But it is the subjective evaluations that cause the most argument. Two methods of subjective assessment are commonly used: the first relies upon a single reviewer living with a loudspeaker for a period of time with his known room and program sources; the second assembles a panel of listeners and plays a particular program through each loudspeaker in turn, with reference, repeat and comparison available.

The 'single reviewer' approach has certain advantages, in that the reviewer can spend considerable time in adjusting the position of the loudspeakers in his room, and has time to carry out extended listening on a variety of well-known material. However, any judgments will to some extent be coloured by the taste of the reviewer concerned, and will reflect the acoustic behaviour of the room. (Cont. on fold out.)

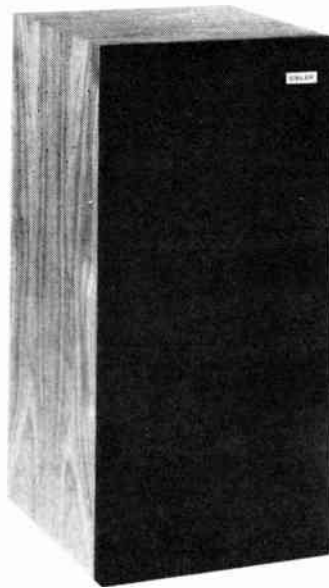
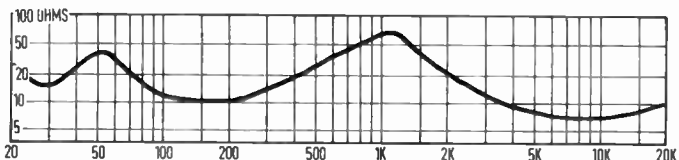
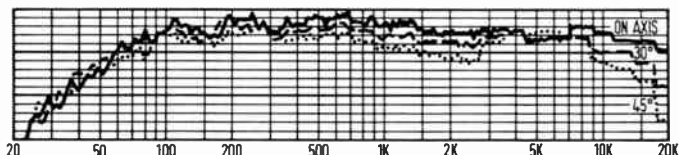


Kef Calinda

Two-unit design plus auxiliary bass radiator (ABR); 70 x 28 x 35 cm (27½ x 11 x 14 in.); 19 kg (46 lb); 100 watt program; £220.50 plus VAT per pair. Kef Electronics Ltd., Tovil, Maidstone, ME15 6QP.

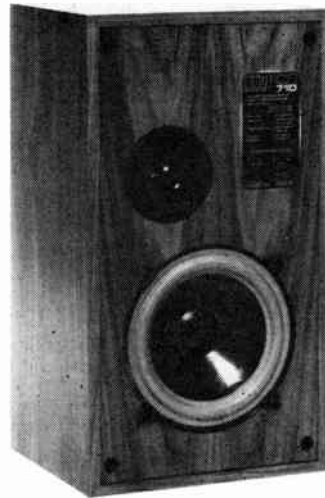
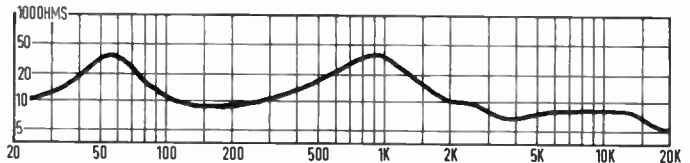
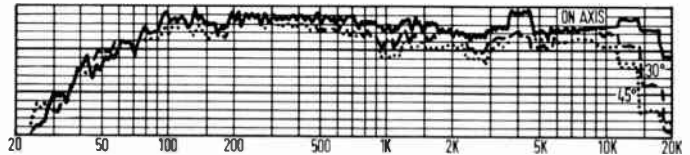


Curve below: Mike in line with cabinet top as per manufacturer's recommendation



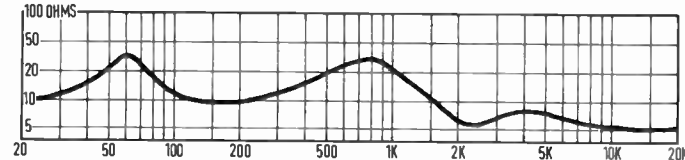
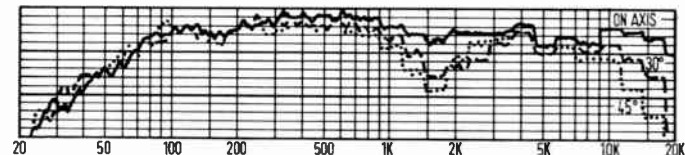
Celef Mini-Pro SM

Two-unit infinite baffle; 58 x 30 x 28 cm (23 x 12 x 11 in.); 16 kg (35 lb); 100 watt program; £205 plus VAT per pair. Celef Audio Ltd., 130 Thirsk Road, Boreham Wood, Herts.



Mission 710

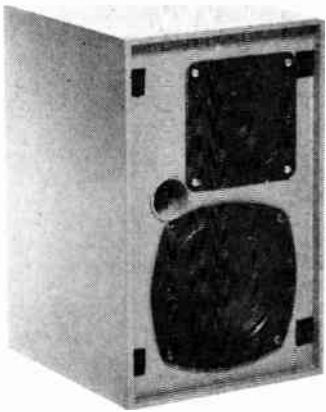
Two-unit infinite baffle; 52 x 29 x 26 cm (20½ x 11½ x 10 in.); 10 kg (22 lb); 80 watt program; £114 plus VAT per pair. Mission Electronics Ltd., 117 Wandsworth Bridge Road, London SW6 2TP.



BLOW UP AMPLIFIER WITH

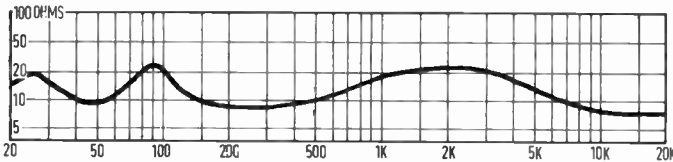
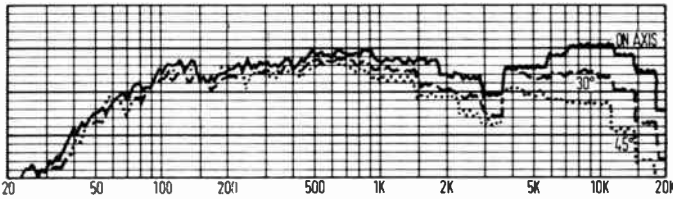


E70's (above) 100 watts DIN. 1 watt produces 94 dB at 1 metre. 100 watts produce 114 dB at 1 metre. E50's 70 watts DIN. 1 watt produces 94 dB at 1 metre. 70 watts produce 112 dB at 1 metre.



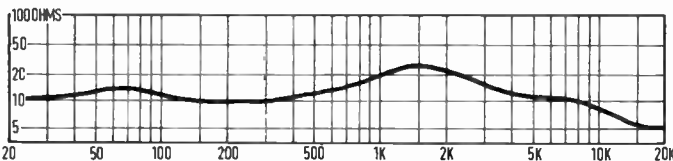
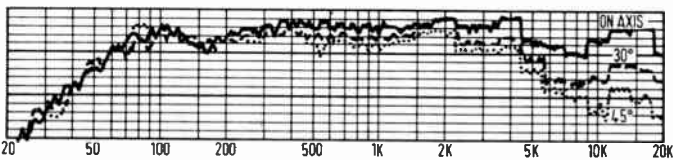
Keesonic Kub

Two-unit reflex; 28 x 18 x 20 cm (11 x 7 x 8 in.); 3 kg (7 lb); 40 watt program; £55 plus VAT per pair. Keesonic Audio Developments Ltd., Halldore Hill, Cookham, Maidenhead, Berks.



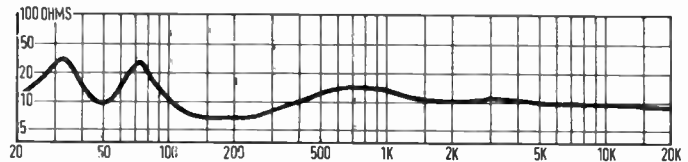
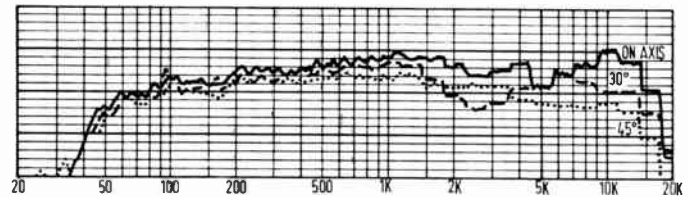
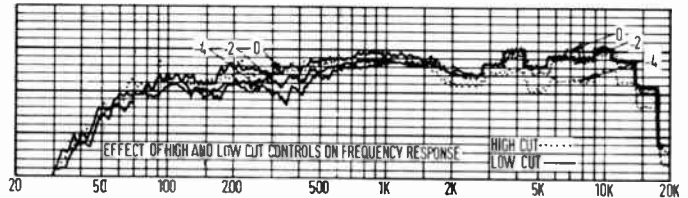
Exposure II

Three-unit design with transmission-line bass loading; 61 x 31 x 31 cm (24 x 12 x 12 in.); 14 kg (31 lb); 100 watt program; £245 plus VAT per pair. Exposure Electronics, Richardson Road, Hove, Sussex BN3 5RB.



Wharfedale E70

Four drive units with reflex bass loading and horn tweeter; 82 x 34 x 36 cm (32 x 13 1/2 x 14 in.); 32 kg (70 lb); 100 watt program; £288.88 plus VAT per pair. Rank Hi-Fi, P.O. Box 70, Great West Road, Brentford, Middx. TW8 9HR.



The eleventh speaker on p. 41

A panel of listeners will help to average out personal prejudices, but will be to some extent unfamiliar with the program, ancillary equipment, and the listening room (a reference speaker is useful but cannot completely overcome this). The short-term listening that this approach necessitates may also tend to obscure some of the subtler aspects of performance, while emphasising frequency response differences and to a lesser extent colorations.

In our last multi-speaker review (July 1975) we attempted to combine these two approaches, and each reviewer had one or two models at home for extended listening. But this invariably introduces the sort of personal judgments one would try to avoid, and this would vary for the different loudspeakers in the review. Obviously the ideal would involve each member of a panel listening at home for some weeks to each loudspeaker, but the project would then take a year or so to complete and doubtless some models would have been modified or become obsolete. So, while acknowledging some of the limitations of any form of loudspeaker evaluation, we have attempted to examine eleven of the more recent designs on the market and present the strengths and weaknesses of each.

YOUR REMARKABLE E's.

New Wharfedale E's will amplify your amplifier. They make 20 watts sound like 200. Because they're up to 30 times more efficient than ordinary speakers. Yet their fidelity's a feat. It's as high as your music can take you.

Even when the sound pressure's on, there's always power in reserve. They're a revolutionary development from Wharfedale, the only UK manufacturer to use computer optimisation techniques. So only Wharfedale is together enough to give it together: realistic volume levels that really sound on the level.

Wharfedale E's need so little power, they let your old amp get on top of any peak.

They'll never clip you round the ears. Even though they'll hit you between the eyes.

Wharfedale E's look loud in their see-through fishnet grilles. Which expose their brushed aluminium rings. And their controls. The controls accommodate the speakers to your accommodation.

If you'd like to hear them, drop us a line.

We'll send you the (short) list of selected E dealers.

Finally, a couple of quiet words of warning: You've heard nothing like them.

They'll fill your head, but they'll empty

your pocket. And they'll blow your mind through your ears.

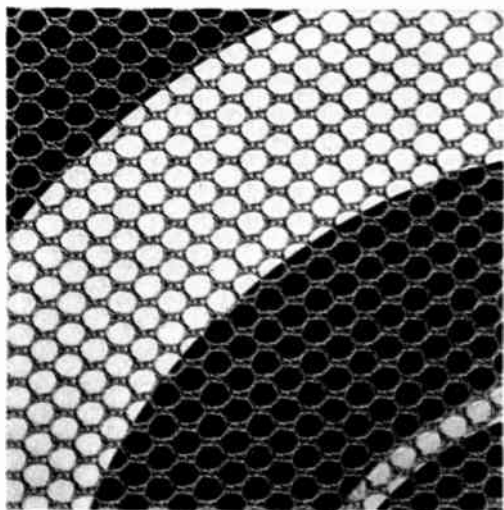
WHARFEDALE

**FROM THE BIGGEST NOISE IN SPEAKERS,
THE BIGGEST NOISE IN SPEAKERS.**

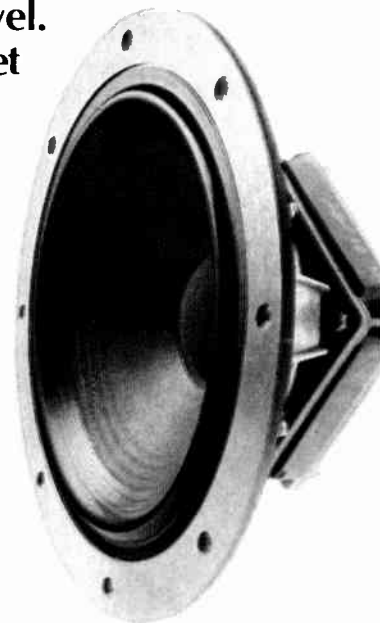
Rank Hi Fi, P.O. Box 70, Great West Road, Brentford, Middlesex TW8 9HR.



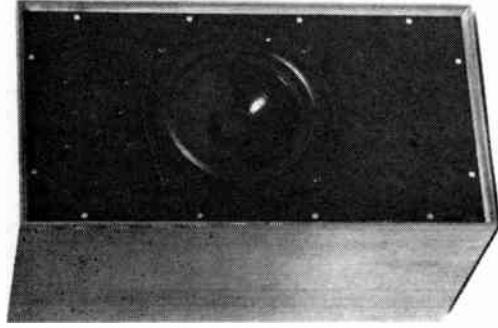
Upper (2kHz to 20kHz) and Lower (200Hz to 2kHz) Contour Controls: 5 positions up to maximum 5 dB attenuation.



Specially developed grille; insertion loss substantially zero.

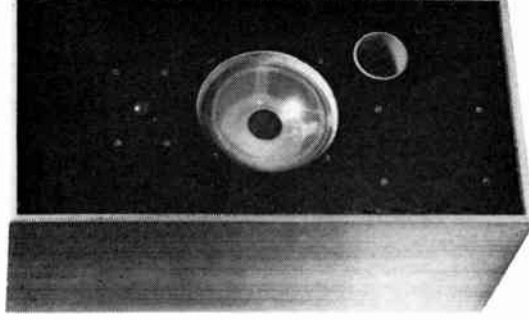
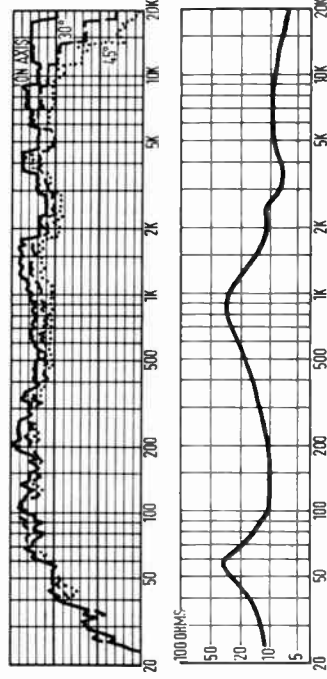


Cones in unique lightweight fibrous material driven by a massive 135,000 maxwell magnet system.



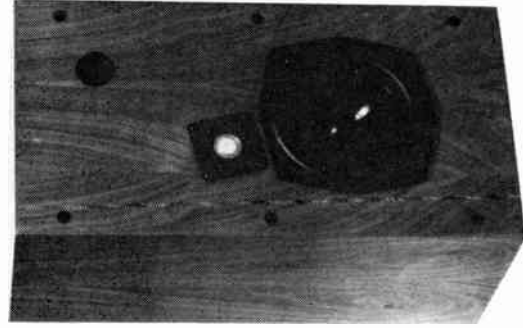
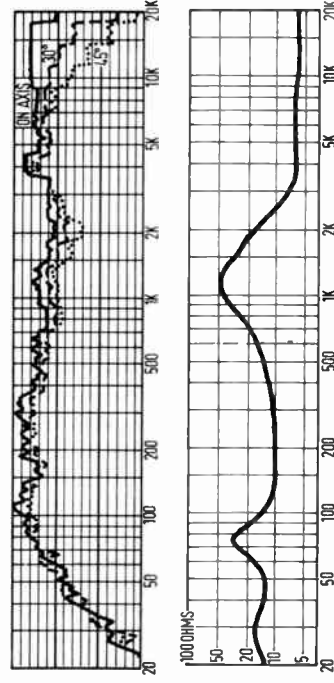
Rogers Compact Monitor

Two-unit infinite baffle; 50 x 28 x 27 cm (20 x 11 x 10½ in.); 11 kg (25 lb); 80 watt program; £159.50 plus VAT per pair. Swissstone Electronics Ltd., 4-14 Barmeston Road, London SE6 3BN.



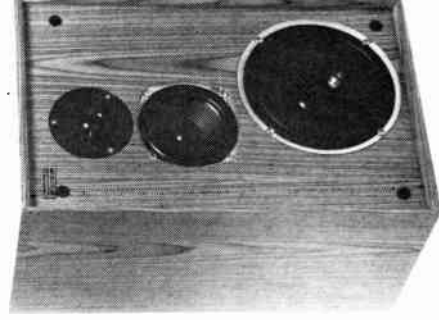
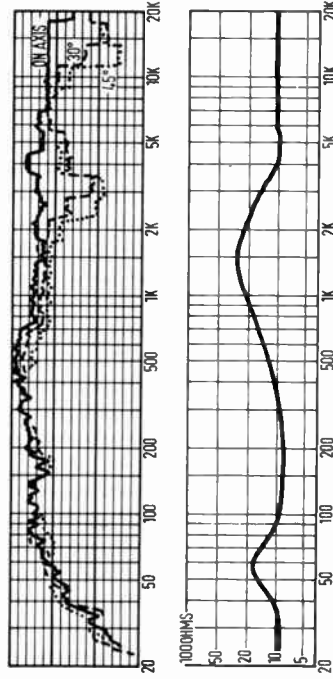
Harbeth

Two-unit reflex; 61 x 33 x 31 cm (24 x 13 x 12 in.); 13 kg (30 lb); 100 watt program; £270 plus VAT per pair. Harbeth, 2a Nova Road, West Croydon CR0 2TL.



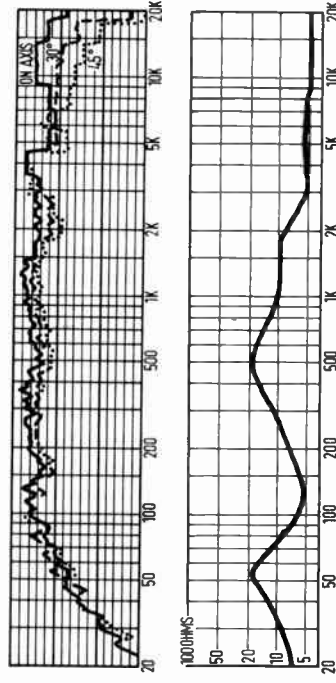
Monitor Audio MA4

Two-unit reflex; 60 x 32 x 28 cm (23½ x 12½ x 11 in.); 16 kg (36 lb); 75 watt program; £173.80 plus VAT per pair. Monitor Audio Ltd., 347 Cherry Hinton Road, Cambridge CB1 4DJ.



Celestion Ditton 22

Three-unit infinite baffle; 51 x 33 x 27 cm (20 x 13 x 10½ in.); 12.5 kg (30 lb); 80 watt program; £150 plus VAT per pair. Rola Celestion Ltd., Ditton Works Foxhall Road, Ipswich IP3 8LP.



GREATER LONDON, HERTFORDSHIRE AND BEDFORDSHIRE

Acton Camera, 86 High Street, Acton, London W3.
Tel: 01-992 4788/2305.
Atkins Radio, 210 Brixton Hill, London SW2. Tel: 01-733 6893.
A. T. Labs, 191 Chaseside, Enfield, Middx. Tel: 01-363 7981.
Azat, 61 Charlotte Street, London W2. Tel: 01-580 4632.
Comet. All branches.
Davis & Kays Photographic, 105 Lawrence Road, London N15.
Tel: 01-802 4131.
Ealing T.V., 3 The Paddock, Popes Lane, Ealing, W5. Tel: 01-579 3178
Eastcote Hi Fi, 112 Field End Road, Eastcote, Pinner, Middx.
Tel: 01-868 2946.
Francis of Streatham, 159 Streatham High Road, London SW16.
Tel: 01-769 0192.
G.E.M., 337-9 High Road, Leyton, London E11. Tel: 01-556 0223.
Herts Hi Fi, 166 St. Albans Road, Watford, Herts. Tel: 92 34644.
Hitchin Radio Service Ltd., 106 Bancroft, Hitchin, Herts.
Tel: 0462 52248.
Laskys. Larger branches.
McDonald Stores, 78 Oxford Street, London W1. Tel: 01-636 2877.
Martins, 125 Stoke Newington High Street, N16. Tel: 01-254 5053.
M. R. & S. Electronics Ltd., 10 High Road, London N15. Tel: 01-802 5452.
Nandos Radio, 328 Edgware Road, London W2. Tel: 01-723 6809.
Nu-Sound, 82 High Holborn, London, WC1. Tel: 01-242 8354.
Nu-Sound, 376 Edgware Road, London W2. Tel: 01-727 1583.
Raytronic, 10 Weald Lane, Harrow Weald, Middx. Tel: 01-427 1127.
REW Audio Visual, 230 Tottenham Court Road, London W1. Tel: 01-637 2625.
REW Audio Visual, 126 Charing Cross Road, London WC2. Tel: 01-836 2372.
Sarays, 131 King Street, Hammersmith, London W6. Tel: 01-748 4747.
Sherbourne Hi-Fi-Phonics, 150 Tollington Park, Stroud Green,
London N4. Tel: 01-272 4327.
Sterling Discout Stores, 45 George Street, Luton, Beds. Tel: 0582 22423.
Surbiton Park Radio, 48-50 Surbiton Road, Kingston, Surrey. Tel: 01-546 5549.
Target Electrical, 45 Katherine Drive, Dunstable, Beds. Tel: 0582 67750.
Tavistock Hi Fi, 35-37 Tavistock Street, Bedford, Beds. Tel: 0234 56322.
Tempo Warehouse, Duck Lees Lane, Mollison Avenue, Enfield, Middx.
Tel: 01-804 8425.
Wally for Wireless, 281-3 Whitechapel Road, London, E1. Tel: 01-247 8501.
Wembley Hi Fi Centre, 412/414 High Road, Wembley, Middx.
Tel: 01-903 9506.

S.W., S.E., WILTSHIRE AND HAMPSHIRE

Aerco Records, 27 Chobham Road, Woking, Surrey. Tel: 048 62 4667.
Blackmore Vale, The Square, Gillingham, Dorset. Tel: 074 76 2474.
Bryants Radio & TV, 371 London Road, St. Leonards on Sea,
Haslings, Sussex. Tel: 0424 423157.
Comet. All branches.
H. C. & C. Coppins, 131/3 Bellegrave Road, Welling, Kent. Tel: 303 5341.
Fairdeal Electrical, 148 Fore Street, Exeter, Devon. Tel: 0392 32681.
Framptons, 90 Cornwall Street, Plymouth, Devon. Tel: 0752 60264.
Godwin Electrical, 313 Chorley Road, Shirley, Southampton, Hants.
Tel: 0703 772558.
Ken Johnstone, 82 High Street, Steyning, Sussex. Tel: 0903 813435.
John King Films, 71 East Street, Brighton, Sussex. Tel: 0273 25918.
Laskys. Larger branches.
F. H. Moss, 6 St. James Parade, Bath, Avon. Tel: 0225 21450.
Peter Scott, 76 South Street, Exeter, Devon. Tel: 0392 56633.
Photomarkets Hi Fi, 26 Broad Street, Bristol 1, Avon. Tel: 0272 294183.
P. R. Sounds, 5 King Street, Melksham, Wiltshire. Tel: 0225 708045.
Rediffusion, 40 Penn Street, Bristol 1, Avon. Tel: 0272 24658.
Rediffusion, 8 Guildhall Shopping Centre, Exeter, Devon. Tel: 0392 76444.
R.L.C. Discount Services, 21 Flazpits Lane, Winterbourne, Bristol, Avon.
Tel: 0454 774145.
Runnymede Hi Fi, 172 High Street, Egham, Surrey. Tel: 389 5036.
Sevenoaks Hi Fi, 118 London Road, Sevenoaks, Kent. Tel: 0732 59556.
Sextons, 37 Bedford Place, Southampton. Tel: 0703 28434
J.R. Sullivan, 21 Southborne Grove, Bournemouth, Dorset. Tel: 0202 47100.
Vixens, 34 Carfax, Horsham, Sussex. Tel: 0403 2230.

EAST ANGLIA, LINCOLNSHIRE AND NOTTINGHAMSHIRE

Baker & Cockling, Rippleside Estate, Ripple Road, Barking, Essex.
Tel: 592 8128.

Baker & Cockling, 695-697 High Road, Seven Kings, Ilford, Essex.
Tel: 599 9061.
Comet. All branches.
Co-op. Firth Road, Lincoln.
H. Gee, 9A Mill Road, Cambridge, CB1 2BD.
Laskys. Larger branches.
J. V. Robinson & Co., 89 High Street, Huntington, Cambs.
Speechley Co., 1 Hawthorn Way, Chesterton, Cambridge. Tel: 0223 58611.
Sleaford Hi Fi, Unit 3, Southgate Precinct, Sleaford, Lincs. Tel: 05293 3270.
Stamford Hi Fi, 9 Red Lion Square, Stamford, Lincs. Tel: 0780 74332.
Peter Watts, 6 Dereham Road, Walton, Norfolk. Tel: 0953 881440.
Welec, 37A New Road, Spalding, Lincs. Tel: 0775 4247.
D. T. Wicks & Co., 49 North Station Road, Colchester, Essex. Tel: 0206 49843.
Les Wright, 101 Mary Street, Scunthorpe, Lincs. Tel: 0724 67738.

WALES, THE MIDLANDS, MERSEYSIDE, OXON, BERKSHIRE

Audiocraft, 23-25 Derrigate, Northampton. Tel: 0604 36291.
G.J. Bennett & Sons, 32-34 High Street, Kings Heath, Birmingham.
Tel: 021-444 5321.
W.A. Brady & Son, 401 Smithdown Road, Liverpool. Tel: 051-733 6859.
Cherwell Valley, The Old Twyford Mill, Kings Sutton Road,
Banbury, Oxon. Tel: 0295 81644.
R.N. Clearstone, 166 Blackburn Road, Bolton. Tel: 0204 22636.
Comet. All branches.
Excell Warehouse, Bridge Road, Wellington, Telford. Tel: 0952 51555.
Norman H. Field, Hurst Street, Birmingham. Tel: 021 772 5160.
E.N.F. French, 52 Dordon Road, Dordon, Near Tamworth. Tel: 0827 892252
Gratispool, 10 Martineau Way, Birmingham. Tel: 021 236 1024.
Hardman Radio, 31 Dale Street, Liverpool. Tel: 051 236 2828.
Hardman Radio, 12/14 St. Marys Gate, Manchester. Tel: 061 832 6087.
Hardman Radio, Guildhall Arcade, Lancaster Road, Preston. Tel: 0772 59264.
Hardman Radio, The Forum Centre, Northgate Street, Chester. Tel: 0244 317667.
Hi Fi Studios, Lonsdale Street, Stoke-on-Trent. Tel: 0782 47125.
Hi Fi Studios, Market Arcade, Newcastle-Under-Lyme. Tel: 0782 613902.
Horntons Electronics, 9-11 Lower Temple Street, Birmingham. Tel: 021 643 0972.
JCV Music, 44 Emscote Road, Warwick. Tel: 0962 43796.
JCV Music, 8-9 Sheep Street, Stratford-On-Avon. Tel: 0789 68874.
Laskys. Larger Branches.
Newdown Hi Fi, 1-3 Castle Street, Chester. Tel: 0244 24179.
W.T. Parker Ltd., 191 Station Street, Burton-On-Trent, Staffs. Tel: 0283 12661.
Reids Photographic & Hi Fi, 28 South Mall,
Birmingham Shopping Centre, Birmingham. Tel: 021 643 0388.
Swifts of Wilmslow, 15 Swan Street, Wilmslow, Cheshire, Tel: 099 64 26213.

SCOTLAND, AND THE NORTH OF ENGLAND

E. Ashcroft & Sons, Beaconsfield Corner, Ormskirk, Lancs.
Audio Aids, 52 George Street, Edinburgh, EH2 2LE Tel: 226 3970/3979
Blackburn & Swallow, 19 Commercial Street, Harrogate, Yorks. Tel: 0423 69249.
Bryson's, 7 Hamilton Road, Motherwell, Strathclyde.
Comet. All branches.
Gerald Carter, Stonecross, Market Place, Garstang. Tel: 0772 3683.
Tom S. Ford, 242 Park View, Whitley Bay, Tyne & Wear. Tel: 08944 24665.
Gratispool Co. Ltd., 38 Lands Lane, Leeds, LS1 6W5.
Gratispool Co. Ltd., 66 Queen Street, Glasgow, G1 3DS.
Tel: 041 221 3740 8290.
Gilson Audio, 234 Linthorpe Road, Middlesbrough. Tel: 0325 61922.
Goff Jackson Gramophones, 14 Hyde Park Corner, Leeds. Tel: 0532 781513.
Hi Fi Opportunities, 33 Handyside Arcade, Newcastle-on-Tyne.
Tel: 0632 27791.
Holborn Hi Fi, 445 Holborn Street, Aberdeen, Grampian. Tel: 0224 25713.
House of Clydesdale, 103/9 Trongate, Glasgow. Tel: 041 647 7100.
John of McLachlan TV, 56 Old Sneddon Street, Paisley, Strathclyde.
Tel: 0484 32294
Kohli & Co. Ltd., Preston Street, Bradford, Yorks. Tel: 0274 32644.
Kenneth Levell Ltd., 13-15 Market Street, Huddersfield, Yorks.
Tel: 0484 32294.
Laskys. Larger branches.
Multisound Hi Fi Ltd., 7 Davygate Arcade, York, YO1 2JU. Tel: 0904 51712.
P.S.B., 196 Selby Road, Leeds.
Quadruphenia, 10 Nursery Street, Sheffield, SE899. Tel: 0742 77824.
Thistle TV, 4/6 Ashdale Palce, Aberdeen.
Tel: 0224 52172.
Vennal Audio Visual, 115 High Street,
Central Arcade, Ayre Scotland. Tel: 0292 64124.

WHARFEDALE



FROM THE ABOVE LIST OF DEALERS, THE BIGGEST NOISE IN SPEAKERS.

MISSION ELECTRONICS

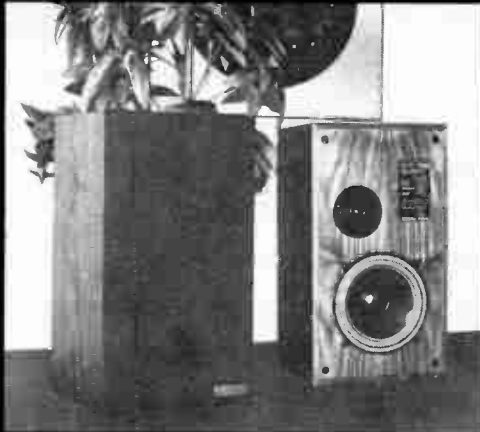
Made in England



Mission Electronics' loudspeakers are available only through a small exclusive network of highest quality stockists. In certain instances this may cause slight inconvenience, but we can assure you that your journey to such a dealer and close inspection of Mission Speaker Systems will prove extremely worthwhile.

MISSION ELECTRONICS

Made in England



the full range on demonstration at:

Radford HiFi

Radford HiFi Limited, 52/54 Gloucester Road, Bristol. BS7 8BH
Tel: (0272) 422709/44593 Telex: 449315

The Measurements

James Moir describes the test procedures and instrumentation used for objective measurements on the eleven loudspeakers

THE techniques used in the objective evaluation of the speakers was described in the report on the previous group tests (July 1975 issue), but the whole subject of loudspeaker testing was covered in more detail in a series of six contributions that commenced in the same issue and continued until the December number. This series should be consulted, for it discusses in detail the measurement of each parameter. Many cannot be measured with any real accuracy, though they are commonly quoted as though the parameter could be measured to an accuracy of $\pm 1\%$.

Frequency Response

The loudspeaker under test was mounted two metres above the ground in the open air, with a B & K 4165 1.2 cm condenser microphone positioned at one metre on the lateral axis of the loudspeaker. The speaker was driven with pink-noise fed from a high quality power amplifier, the reproduced signal being examined by a B & K 2112 octave analyser driving a B & K 2305 level recorder to produce a printed frequency response curve. Unless otherwise stated, frequency response curves were taken at a point on an axis equidistant from the tweeter and the mid-range unit; each major vertical division corresponds to 10 dB, minor divisions 2 dB.

Polar Response

The test arrangement used was exactly as that employed for the measurement of frequency response, but with the speaker turned through an angle of 30° and 45° with the microphone on the axis equidistant between the tweeter and mid-range unit. Presentation of the polar distribution data as frequency response curves measured at two angles off the axis is thought to be a more effective method of indicating the results of off-axis listening than is the standard polar plots taken at half a dozen frequencies.

Amplitude Distortion

All the distortion measurements were taken with the microphone positioned at a distance of one metre from the loudspeaker. The harmonic distortion of the loudspeaker was measured at four frequencies, 80 Hz, 400 Hz, 1 kHz and 4 kHz, the acoustic amplitude of each of these signals being increased in 10 dB steps from a level of 80 dB until the distortion rise indicated that the unit was reaching its distortion limited power handling capacity. The input signal was provided by a B & K 1014 Beat Frequency Oscillator fed when necessary through a purifying network and driving a 100 watt high-quality power amplifier. The reproduced audio signal was fed into a Marconi Type 2330 narrow-band wave analyser, allowing direct measurement of the amplitude of each individual harmonic. The figures given in the Table for 2nd and 3rd harmonics refer to dB below fundamental.

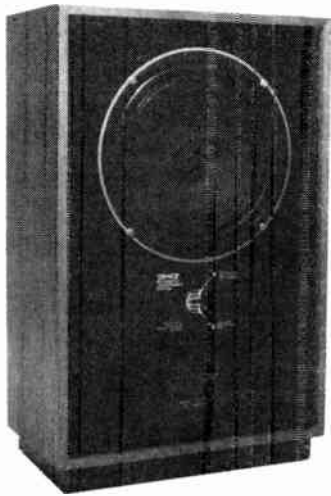
Frequency Intermodulation Distortion

The loudspeaker was fed from two B & K 1014 oscillators adequately decoupled through a mixing network and driving a 100 watt amplifier. The oscillators produced two signals, one the modulating frequency (100 Hz) and the other the modulated frequency (3 kHz). The level of the modulating 100 Hz frequency signal was set to 90 dB, measured at one metre, and the resultant modulating frequency with additional sidebands due to amplitude as well as frequency intermodulation distortion was fed into the Marconi Type 2330 narrow band wave analyser. To separate the amplitude and frequency intermodulation components the output signal from the microphone was fed through a 3 kHz limiter and discriminator, the output being the frequency intermodulation components only.

Amplitude Intermodulation Distortion

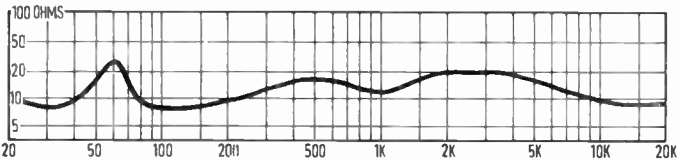
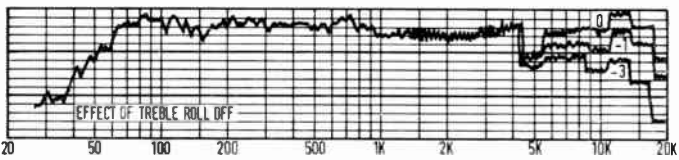
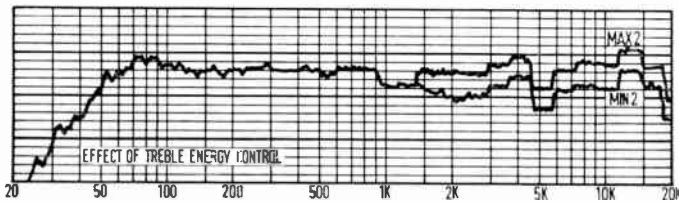
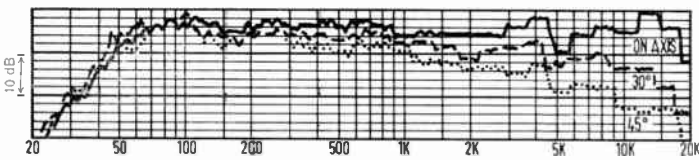
The test procedure used was exactly as that employed for the measurement of frequency intermodulation distortion, though different test frequencies were adopted to eliminate any Doppler distortion present. The two oscillators were set at 500 Hz and 2 kHz and each adjusted to give a SPL of 90 dB at a distance of one metre from the loudspeaker under test. The resultant distortion sidebands produced either side of the 2 kHz signal were measured on a Marconi Type 2330 narrow band wave analyser.

continued on page 45 (Table on page 43)



Tannoy Berkeley

Dual-concentric two-unit system (horn-loaded tweeter); 84 x 53 x 30 cm (33 x 21 x 12 in.); 41 kg (90 lb); 85 watt; £354 plus VAT per pair. Tannoy Products Ltd., St. Johns Road, Tylers Green, High Wycombe, Bucks. HP10 8HR.



Each small vertical division corresponds throughout to 2 dB on the frequency response graphs.



James Moir's laboratory, showing test equipment

MISSION
ELECTRONICS
Made in England

Complete Audio Systems Ltd

32 Grove Road Eastbourne Sussex BN21 4TR
Tel: (0323) 27362 Hi Fi (0323) 30217 Records
36 High Street Rottingdean Sussex BN2 7HR
Tel: (0273) 31082



Mission 730

At Complete Audio we specialise exclusively in the highest quality equipment, with service to match, and now offer with confidence the full range of MISSION loudspeakers.



Mission 720



Mission 710

**THE
Hi Fi
SHOP
!**

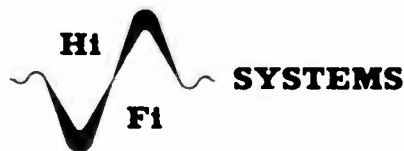
MISSION
ELECTRONICS
Made in England

Agents for:—

- IMF
- QUAD
- KEF
- CAMBRIDGE AUDIO
- CONNOISSEUR
- REVOX
- NAIM
- AIWA
- RADFORD
- SUGDEN
- LINN SONDEK
- SME

MISSION,
undoubtedly one
of today's finest
loudspeakers.

SUGDEN
We cannot sell
better, it isn't made.



**JOHN STOCKTON HI-FI
SYSTEMS**

118 BUTTERMARKET STREET
WARRINGTON WA1 2NZ
Tel: 32981 after hours 67955

OBJECTIVE TEST DATA (prepared by James Moir Associates)

Loudspeaker Supplement

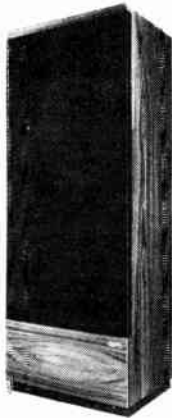
MEASUREMENT	CELEF Mini Prof SM	CELESTION Ditton 22	EXPOSURE II	HARBETH H. L. Monitor	KEESONIC Kubs- Bookshelf	KEF Calinda	MISSION 710	MONITOR AUDIO MA 4	ROGERS Compact	TANNOY Berkeley	WHARFE- DALE E70
FREQUENCY RESPONSE (± 3 dB) 30° off to right of axis 45° off to right of axis	65 Hz-17 kHz 60 Hz-12 kHz 60 Hz-10 kHz	70 Hz-18 kHz 65 Hz-10 kHz 70 Hz-7 kHz	70 Hz-17 kHz 60 Hz-5 kHz 60 Hz-4.5 kHz	60 Hz-17 kHz 65 Hz-10 kHz 58 Hz-8 kHz	90 Hz-16 kHz 85 Hz-12 kHz 80 Hz-5 kHz	60 Hz-17 kHz 55 Hz-11 kHz 55 Hz-10 kHz	70 Hz-17 kHz 70 Hz-10 kHz 70 Hz-7 kHz	63 Hz-17 kHz 60 Hz-7 kHz 50 Hz-2 kHz	55 Hz-17 kHz 55 Hz-10 kHz 55 Hz-10 kHz	50 Hz-17 kHz 45 Hz-5 kHz 47 Hz-1 kHz	100 Hz-14 kHz 90 Hz-10 kHz 70 Hz-10 kHz
HARMONIC DISTORTION	2nd 3rd % 80 Hz 80 dB 90 dB 100 dB 400 Hz 80 dB 90 dB 100 dB 1 kHz 80 dB 90 dB 100 dB 4 kHz 80 dB 90 dB 100 dB	2nd 3rd % 65 68 .11 48 48 .56 20 38 10 65 58 .12 58 54 .25 54 50 .4 57 65 .15 54 56 .25 47 53 .5 64 49 .35 58 56 .2 50 58 .35	2nd 3rd % 52 50 .4 44 48 .8 LIMIT 95 dB 53 65 .22 47 54 .5 41 53 .9 55 58 .22 62 56 .2 53 57 .28 48 56 .45 68 68 .06 61 64 .11 48 61 .4	2nd 3rd % 39 65 1.1 32 54 2.5 20 40 10 62 56 .2 42 48 .9 34 48 2 58 39 1.1 60 56 .2 65 54 .21 48 52 .45	2nd 3rd % 56 48 .45 34 38 2.2 LIMIT 95 dB 56 52 .28 50 44 .7 26 38 5 58 53 .25 60 65 .1 54 48 .45 48 42 .9 56 59 .2 55 57 .22 55 55 .25	2nd 3rd % 40 48 1.1 28 40 4 20 30 10 65 58 .14 53 56 .28 40 52 1 60 65 .1 60 60 .14 52 60 .29 48 38 1.4 50 32 55 52 .3 LIMIT 94 dB	2nd 3rd % 46 55 .55 34 45 2 19 34 11 62 65 .1 57 56 .23 50 55 .35 57 43 .7 54 40 1 48 38 1.4 58 65 .14 54 61 .23 48 60 0.4	2nd 3rd % 53 62 .22 41 48 1 LIMIT 95 dB 60 66 .11 63 60 .13 55 54 .25 56 49 .4 54 44 .63 51 38 1.2 62 68 .1 60 68 .11 55 65 .19	2nd 3rd % 39 58 1.1 27 44 4.5 LIMIT 97 dB 41 48 1 33 42 2.2 28 40 4 58 62 .15 56 56 .22 51 53 .35 60 64 .12 55 60 .22 35 58 1.8	2nd 3rd % 65 67 .07 52 65 .25 47 — .45 62 66 .09 60 48 .4 64 48 .4 60 48 .4 30 43 3.1 65 — .06 58 — .12 48 — .4	2nd 3rd % 44 56 .62 32 52 2.5 23 34 7 54 56 .25 53 60 .25 65 51 .32 59 65 .12 54 65 .2 49 62 .35 65 68 .06 60 66 .11 58 62 .15
DOPPLER DISTORTION 3 kHz and 100 Hz 90 dB figures quoted are distortion sidebands re 3 kHz sig.	-48 dB	-51 dB	-42 dB	-44 dB	-28 dB	-28 dB	-41 dB	-38 dB	-36 dB	-55 dB	-55 dB
AMPLITUDE INTERMODULATION 2 kHz and 500 Hz 90 dB figures quoted are distortion sidebands re 2 kHz sig.	-57 dB	-54 dB	-58 dB	-56 dB	-50 dB	-52 dB	-50 dB	-52 dB	-52 dB	-51 dB	-58 dB
MINIMUM IMPEDANCE (ohms)	7 (3-8 kHz)	4.5 (12 kHz)	5 (19 kHz)	6 (3-6 kHz)	7 (15 kHz)	7 (10 kHz)	5 (2-3 kHz)	8.5 (200 Hz)	6 (3-4 kHz)	8 (125 Hz)	7 (200 Hz)
EFFICIENCY (%)	0.28	0.2	0.15	0.22	0.19	0.21	0.27	0.21	0.17	0.76	1.18
SENSITIVITY With 2.82V of pink noise. Measured at 1 m	87.5 dB	88 dB	84 dB	87 dB	86 dB	84.5 dB	87.5 dB	86 dB	85 dB	92.5 dB	96 dB
MAXIMUM REACTIVE ELEMENT Phase difference* between V & I Frequency Impedance	60° C 1.7 kHz 12.5 Ω	42° C 72 Hz 9 Ω	34° C 3 kHz 14 Ω	68° C 2.2 kHz 12 Ω	40° C 5 kHz 12 Ω	64° C 2.2 kHz 17 Ω	62° C 1.8 kHz 7 Ω	36° L 800 Hz 17 Ω	53° C 1.5 kHz 13 Ω	52° C 72 Hz 11 Ω	58° C 90 Hz 13 Ω
IMPEDANCE Pink Noise Range	9-8 Ω 7 Ω-40 Ω	6.4 Ω 4.5 Ω-17 Ω	10-8 Ω 5 Ω-30 Ω	10 Ω 6 Ω-46 Ω	10.4 Ω 7 Ω-25 Ω	12.2 Ω 7 Ω-68 Ω	8-7 Ω 5 Ω-34 Ω	10-6 Ω 8.5 Ω-28 Ω	10.4 Ω 6 Ω-36 Ω	12.1 Ω 8 Ω-30 Ω	9.5 Ω 7 Ω-35 Ω

* C=capacitive load L=inductive load

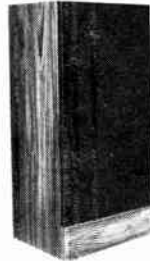
**GETTING BETTER
AND BETTER**

MISSION
ELECTRONICS

Made in England



MISSION 730



MISSION 720



MISSION 710

Supex — Nightingale — Linn Sondek — Linn Isobarik — Lecson — Rogers — Lux — Rega — Fidelity Research —
Monitor Audio — Sugden — SMC — Quad — Neal — Imf — Fons — Dual — B & W — Aiwa.

FOR IMMEDIATE
DESPATCH
QUOTE CREDIT
CARD NO
PERSONAL EXPORT
PART EXCHANGE
OPEN 5 DAYS A WEEK
CLOSED MONDAY

Reading Cassette & Hi Fi Centre

5/6 HARRIS ARCADE, FRIAR STREET, READING, BERKS. TEL. (0734) 585463

ALL ABOVE CASH
PRICES INC. VAT &
ARE CORRECT AS AT
1.3.77

FOR LATEST PRICE
PHONE OR SEND
S.A.E.

photocraft HI-FI



**KENT'S exclusive
dealer for:**

MISSION
ELECTRONICS

Made in England

Buying Hi Fi equipment can be a very difficult task which is why we at Photocraft Hi Fi believe that a talk with an experienced dealer can save you both time and money. In recent years we have gathered many of the finest pieces of Hi Fi equipment together, to join one of the best equipped Hi Fi showrooms in East Kent.

Before you buy it, hear it, at Photocraft Hi Fi.

KOSS-NAKAMICHI-MISSION-B & W-REVOX-THORENS-KEF-TRANSCRIPTORS etc.

Call Tom or Geoff on Ashford 24441

Opposite Top Rank—40 High Street, Ashford, KENT



Impedance

The impedance of each loudspeaker was measured by feeding the unit from an oscillator, through a high series resistance to maintain constant current through the speaker voice coil in spite of any change of impedance with frequency. The voltage/frequency relation was plotted by a B & K 2305 level recorder, the trace being calibrated using a Marconi TF 2700 universal bridge to measure the impedance at a reference frequency of 1 kHz. To obtain a single average figure for the impedance of the loudspeaker, the procedure was repeated using a signal source of pink noise.

Phase Angle

Amplifiers do not like being loaded with a loudspeaker that has a poor power factor, i.e. an input impedance that has a phase angle approaching 90 degrees, particularly when this is combined with an impedance that is lower than about 4 ohms. Many loudspeakers exhibit these low values of impedance and a poor power-factor around the crossover frequencies due to shortcomings in the design of the dividing network. Though amplifiers prefer to work into a load that is a constant pure resistance, variations in the speaker impedance above the rated value are much less troublesome than variations downward below the rated value. The impedance of each speaker was measured by the method described above, the phase angle (power factor) being measured by a Solatron phase angle meter.

Efficiency

The absolute efficiency of each loudspeaker system was obtained in the following way. The electrical power input to the unit was calculated from measurements of the voltage and currents using music shaped pink-noise. The acoustic power output from the loudspeaker was

obtained by placing the unit in a listening room environment adjacent to a calibrated sound power source of variable output (B & K Type 4205). The output of this reference source was adjusted until it increased the reverberant sound pressure level by 3 dB, the sound power from the loudspeaker was then the same as that from the reference source. The output power from the reference source was read off its calibrated meter and compared with the electrical power input to the loudspeaker. The efficiency was then acoustic power output $\times 100$, divided by electrical power input.

Sensitivity

The sensitivity of each loudspeaker was measured by applying a pink noise signal voltage of 2.828 V (corresponding to 1 watt of power for an assumed load of 8 ohms) to the loudspeaker terminals and measuring the sound pressure level (dBC weighted) at a distance of 1 metre from the loudspeaker. Care must be taken when interpreting sensitivity and efficiency results as it is quite possible (due to differences in impedance and directivity) for one loudspeaker to exhibit a higher sensitivity over another loudspeaker whilst having a lower inherent efficiency.

The measurement figures obtained by the test technique described here are presented in the Table headed OBJECTIVE TEST DATA (p. 43) and in the four groups of curves. It is important that the various response plots be interpreted in conjunction with the subjective comments and qualifications, as the ear is still a more subtle instrument than a microphone and meter.

The Listening Tests

Paul Messenger discusses the listening situation and problems of subjective assessment

Subjective Tests

THE listening room was a typical lounge 19 \times 14 \times 8 ft. with a reverberation time of 0.42 secs at 500 Hz, falling away slowly above 3 kHz; some furniture had been removed at one end to enable the loudspeakers to be moved about and auditioned behind acoustically transparent screens. The panel were seated some 10–12 ft. from the speakers stands.

The test programs were provided mainly from first or second generation master tapes from a Philips Pro 20 professional recorder running at 15 i/s. Some disc record dubs were also used, but were considered sonically less satisfactory. These were fed to two separate Quad 33/303 amplifiers which allowed level matching between the auditioned loudspeaker and its reference. Throughout the tests, levels between the test loudspeaker and reference were carefully matched by monitoring the mean s.p. in the reverberant field of the room, as small errors here can give very misleading results; switching to a reference by means of a push button operated relay system was at the discretion of the panel.

Some will no doubt criticise the use of the 303 for its fairly modest power and old design (they might even recommend the even earlier Quad II design!). We will excuse ourselves by pointing out that the levels used were modest and that there was no clipping (the peak power measured with an oscilloscope being 15.5 watts). Also, we were the victims (inevitably) of Murphy's Law when one of the 405s, kindly loaned by Quad at short notice, stopped working early in the tests. With the panel assembled and the early tests to repeat, there was little alternative to using the 303s.

Each speaker was marked on a scale of ten on eight particular parameters by each member of the panel. Each parameter was equally weighted but was used to give guidance to the performance of the loudspeaker rather than provide a strict ranking order.

Although it would be possible to obtain a ranking order, this would mean applying a specific weighting to each parameter, something which depends to a considerable extent upon an individual's preferences. It was noticeable that those who had a particular interest in pop music had a somewhat different perception of performance,

particularly in the bass, than those with predominantly classical inclinations.

This reluctance to provide a ranking order was reinforced by finding quite noticeable discrepancies between different people's results when the test data were subsequently subject to a detailed statistical analysis, implying that each person applies different percepts and values when making judgments. It was interesting that a very good correlation was found between the overall ranking and the directivity of the loudspeakers; this is a fairly new area of investigation which we intend to examine in greater detail in a forthcoming feature article.

After obtaining the individual rankings on the various parameters, certain speakers were compared one with another. By and large the comments of the blind listening were confirmed, but it was obvious that value judgments on distinct sonic differences could not be unanimous. Although the better-scoring loudspeakers were preferred by more people on more parameters, there was not total agreement, even when openly discussing these differences. No one loudspeaker possessed an overall advantage in every aspect of performance.

The overall sound quality caused some unease in some members of the panel, and it was assumed that the unfamiliarity of program material and room were the cause of this. A check was made with another listening room of similar reverberation time, and small differences were noted in bass and treble performance. Nevertheless, these did not materially affect the overall preferences and applied equally to all loudspeakers. We still advocate that a prospective loudspeaker purchaser should endeavour to listen in his own room with his own signal source if possible.

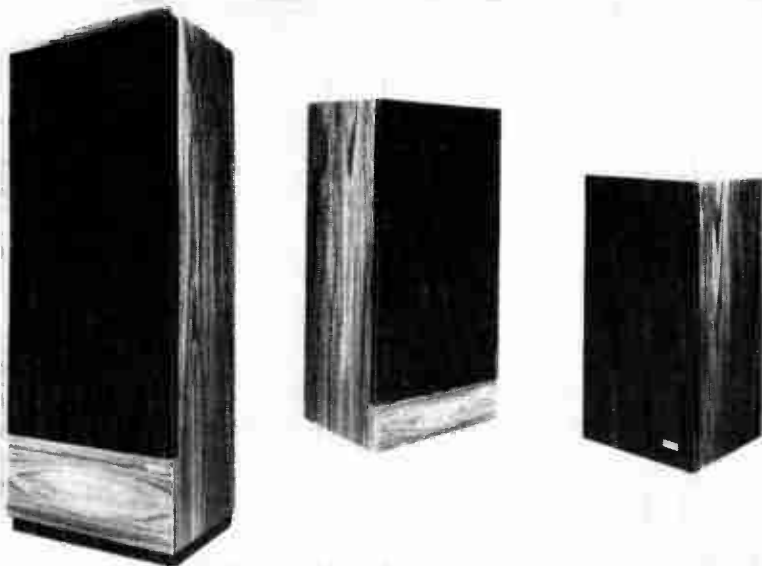
No attempt was made to assess the ultimate power handling and sound power output of the speakers, as this is dependent on the program material, and we did not wish to encourage the early onset of listening fatigue or the premature failure of any of the loudspeakers. ●

SUBJECTIVE PARAMETERS

- | | |
|---------------------------|--------------------|
| (a) Smoothness | (e) HF quality |
| (b) Midrange coloration | (f) LF quality |
| (c) Tonal balance | (g) LF extension |
| (d) Transient performance | (h) Stereo imaging |

MISSION ELECTRONICS

Made in England



ARE YOU MISSION A GOOD THING ?

**DON'T MISSION HEARING THE
MISSION AT**

GUILDFORD HI-FI

270 HIGH ST, GUILDFORD, SURREY Tel. 71534

WHERE MUSIC MATTERS

"The Listening Post"

(formerly trading as Audio T-Bucks)

MISSION ELECTRONICS

Made in England

*As most enthusiasts are aware
we, at The Listening Post,
are most selective about the quality
of the equipment we stock.
You will therefore find that we supply
ONLY the finest British speakers.
MISSION loudspeakers are now high
on everyone's list and we thoroughly
recommend that you come in and
LISTEN TO MISSION!!!*



105 High Street, Eton, Berkshire

Telephone Windsor 54531 and 53014

The Findings

Judgements of the listening team on each model, based on notes and discussions by Donald Aldous, John Atkinson, Trevor Attewell, John Crabbe, Tony Faulkner and Paul Messenger and incorporating salient points from the measurements

Tannoy Berkeley

The Tannoy Berkeley is a massive and heavy reflex loudspeaker using the famous dual-concentric drive unit, a 15 in. bass driver with horn tweeter using the cone flare as part of the horn. It is most attractively styled and the grille cloth is available in a range of colours.

Some of the team found its limitations unacceptable; but it should be noted that the loudspeaker has a relatively narrow HF beam, so few were in an ideal listening position. It was judged to have especial virtues on pop music, with fairly firm, clean and well extended bass. The main criticisms related to classical reproduction and complaints of unevenness: coarseness, with coloration in mid and treble, and some detail clouding were noted.

The exact location of the listener w.r.t. the tweeter axis seemed to govern the response, so it would seem that this loudspeaker may have a preferred 'sweet spot' (as do such speakers as the Quad ELS and Dahlquist), which is just off the tweeter in this case. The main virtues of the Tannoy lie in its high sensitivity and power handling capability. It is capable of prodigious acoustic output, and is highly regarded by those whose inclinations lie in self-inflicted premature deafness. Seriously though, for high level pop monitoring, party, or disco work the Tannoy must take some beating (and inflict a few hernias).

Wharfedale E70

The Wharfedale E70 is a unique design concept among modern British loudspeakers. It features four high-efficiency drive-units with powerful magnets and light cones (the tweeter is horn-loaded) in a heavy enclosure, which is quite high but uses minimal floor area (about 1 ft²). The styling can only be described as 'aggressive unorthodox', as a wide-mesh transparent grille makes no attempt to conceal the very well finished drive-unit and reflex-port frames (front mounted).

The E70 was very highly rated on most parameters by all of the listening panel, being particularly praised for its excellent detail and transient capabilities. The most serious reservation concerned the bass extension, which has been compromised for the sake of efficiency and this was strongly criticised by two of the panel; this trade-off will undoubtedly be a matter of personal taste. Also, a pair might do very well in a room with a tendency to bass accentuation and/or muffled treble. Slight coloration and edginess was also noted, but the excellent transmission of fine detail most impressed the panel.

The staggeringly high efficiency (for a non-horn-loaded loudspeaker) is this design's main feature. Its sensitivity has the same margin over the Tannoy as the Tannoy has over the next in line, and has nearly a 10 dB margin over most. This means that very little amplifier power will be needed to achieve realistic sound levels (try it on a tranny!). It would probably make an excellent partner for Class-A transistor or valve amplifiers. It would also be interesting to carry out some experiments combining the speaker (or its smaller, cheaper E50 brother) with a subwoofer system, which might prove a formidable combination.

Celef Mini-Pro SM

This is a fairly efficient loudspeaker and is exceeded only by the larger and more expensive Wharfedale and Tannoy models in this respect. It comprises two Peerless drive-units in a 2 cu. ft. infinite baffle (IB) enclosure, a paper cone 8 in. bass unit and 1 in.

soft dome tweeter of doped fabric. It is best suited to stand mounting.

The Celef scored consistently above average, only one member of the panel marking it down. Some coloration was noted in the lower mid-band and the measured slight depression in the upper mid-band was detected. A slightly shrill treble was also criticised by some.

The construction was of high quality throughout, the cabinet having a painted back with teak finish on the sides and front beneath the grille. The grille is a chipboard frame covered with black material and is secured by plastic pins. The damping consists of bituminous pads, foam and cellulose wadding.

This would seem to be a good all-round speaker which should make modest demands of an amplifier, due to its efficiency and moderate impedance characteristic. It is intended to be equally suitable for pop or classical, although fanatics on either side may find it a little lacking.

Celestion Ditton 22

The Ditton 22 was liked by all but two of the panel and was particularly well received by those with 'pop' inclinations. The frequency balance was considered generally neutral but a little cold. Some coarseness and lack of detail was also noted. The above-average sensitivity and smooth if slightly low impedance characteristic should enable it to be driven to high sound levels with a fairly modest amplifier.

The two members of the panel who were somewhat unhappy about this model criticised its general smoothness and mid-range coloration; one member was unhappy about the *hf* quality. However, the overall reaction was favourable and one member placed it at the top of his list.

The construction was sound, with teak finish front and grille recessed in the cabinet. The mid-range unit is in a separate enclosure, which forms a front-to-rear brace. This three-unit system is suitable for (solid) bookshelf or free-standing application and appears to offer excellent value for money.

Exposure II

This is a compact three-unit model from a company new to loudspeakers, employing an 8 in. bass unit from Richard Allan and tweeters from Coles and Kef. It was the only loudspeaker in the survey employing transmission-line loading, which is unusual in an enclosure of this size and naturally constricts the length of the line somewhat. The bass unit terminals and fuse are mounted at the top of the 'teak' cabinetwork, which is black painted front and rear and uses a contoured Declon foam grille. Construction was good and high quality components (eg air-cored inductors) are used in the crossover.

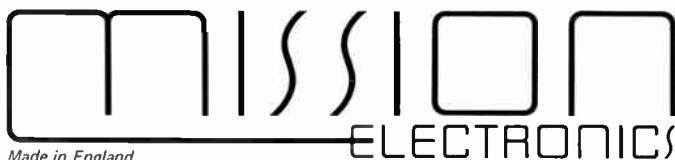
The loudspeaker was found to be fairly neutral with no particular vices. The bass was well controlled and a little light, and the treble was slightly dim. Most of the panel were favourable, although two were rather less happy. Although the impedance characteristic is fairly smooth and should give an amplifier little trouble, the speaker was the least efficient in the survey and will need some power to achieve realistic levels.

Harbeth

This is the loudspeaker designed and manufactured by Dudley Harwood (late of BBC Research) which was described in some detail in April's 'News'. It uses the new polypropylene cone

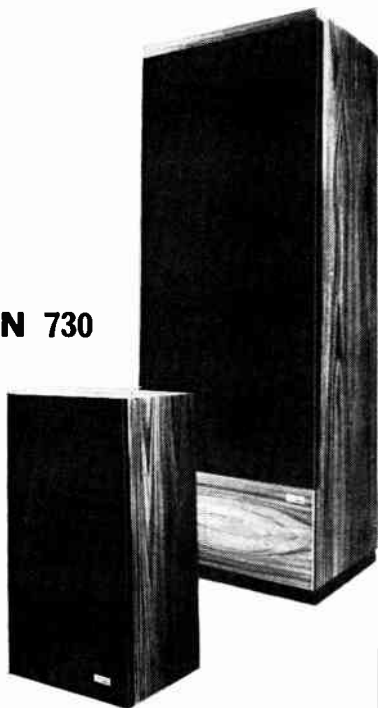


See and hear this superb range of British loudspeakers



Made in England

MISSION 730



MISSION 710

HOME DEMONSTRATIONS
FREE INSTALLATIONS
2 HIGH STREET, EAST GRINSTEAD,
SUSSEX
TEL.: EAST GRINSTEAD 27787

AN INDEPENDENT REVIEW

With several hundred speakers on the market, any hi-fi dealer is faced with the unenviable task of selecting only those he can wholeheartedly recommend.

There are several criteria to satisfy:

- Accuracy of reproduction.
- Extreme frequencies reproduction capability.
- The theory of 'musicality'.
- Input requirement/output potential.
- Comparison with established references.
- Size, appearance, finish.
- Trend of customer interest.
- Value for money.

It is true to say that our stock items are selected for these reasons, and only after extensive listening tests.

WHOSE SPEAKERS DO WE STOCK?

- SPENDOR ● GALE ● QUAD ● IMF ● CHARTWELL
- J. ROGERS ● B & W ● MONITOR AUDIO ● KLH ● KEF
- YAMAHA NS1000 ● VIDEOTONE ● RAM ● CASTLE
- TANNOY ● SMC

and:



Made in England

At Hi Fi CONSULTANTS, MISSION had to overcome two things:

- 1: Stiff competition from the superb speakers already wired to our comparator.
- 2: A prejudice we harboured after seeing their awful publicity material—'listen to Mission!'.

Anyway the sound quality won the day and each of Mission's three systems can now be heard in our studio.

MISSION 710 Bookshelf unit requiring minimum drive of 15 W Good power handling and ideal choice as extension speakers where high quality ancillary components are used.

MISSION 720 A beauty! Genuine alternative to certain very well established makes. Accurate, musical and has advantage of very good power handling.

MISSION 730 4 drive system of exceptional power handling yet taking up only 12½" x 12½" floor space. Effortless reproduction. Well finished attractive cabinets.



CONSULTANTS (Peterborough)
13 Whitsted Street, Peterborough,
Cams. Tel. (0733) 51007

material in an 8 in. drive-unit for bass and midrange (manufactured to specification by Chartwell) plus a 1 in. soft fabric dome Son Audax tweeter mounted in a 2 cu. ft. 'thin wall' damped reflex cabinet.

This speaker received very good marks from all the panel on nearly all parameters and was particularly liked on classical music. Its clarity and low mid-range coloration were particularly noted, the midrange being slightly depressed w.r.t. the bass and treble, giving a marginally recessed sound. Slight shrillness in the treble followed by some roll-off at extreme *hf* was a comment applied to both speakers using the S.A. tweeter under the test conditions. The bass performance was less well received by three members of the panel.

The efficiency was fractionally above average and amplifier requirements should be fairly modest. The robust crossover components should allow high sound levels to be reached without distress, and there is provision for matching sensitivities of tweeter and bass mid-range within 1 dB, which suggests that careful quality control will be practised. Construction is sound with black painted front and contoured foam grille; unusually, the back is removable and secured by numerous screws à la BC1 and LS3/6 (indeed the cabinet as a whole bears great similarities to these loudspeakers).

Keesonic Kub

This can be fairly described as cheap and cheerful, being finished in bright orange. Notwithstanding its low cost and modest pretensions, this unit was only actively disliked by two members of the panel, although all noted the bass roll-off, uneven frequency balance and some roughness.

The efficiency is about average and surprisingly high sound levels can be reached with a powerful amplifier. Bearing in mind the low price, this speaker will undoubtedly find a wide following in more modest systems or as an extension or 'Hafler' speaker. In many ways it may be considered a direct competitor to the successful Hungarian Videotone Minimax.

The orange paint was found to flake rather easily when attempting to remove the grille, but there has been obvious attention to detail as the loudspeakers are provided in left- and right-handed pairs and have high quality crossover components. The use of reflex loading in as small a loudspeaker as this is unusual, but it appears to be accurately tuned and presumably this is at least partly responsible for the creditable combination of efficiency, power handling and bass extension in such a modest design.

Not quite Rolls-Royce finish, but remarkably good value for money.

Kef Calinda

The Kef Calinda is in many ways a descendent of the popular Cadenza, being a two-unit system with auxiliary bass radiator (ABR). However, considerable extra attention has been paid to cabinet damping and crossover design, and this slim tall loudspeaker is designed specifically for floor standing.

The panel was fairly evenly divided on this model; members on one side of the room preferred it to those on the other, which may suggest a freak of room acoustics or the need for especial care in setting up. Those who were positive described the speaker as neutral, good and free from obvious defects, though the bass and upper bass were not to everyone's taste in this listening room.

The speaker was one of the less efficient in the survey, so a powerful amplifier would be an advantage; the drive units are capable of handling high power levels without distress.

The Calinda was finished with 'teak' top and sides, elsewhere black painted and with fabric grille; construction throughout was excellent and adjustable plastic feet are provided to assist with uneven surfaces. Although heavy, indicating its sound construction, the loudspeaker did not seem unduly unmanageable.

Monitor Audio MA4

This is a 2 cu.ft. reflex loudspeaker designed for stand mounting and using two drive-units—the well-known KEF B200 bass/mid-range and a specially modified Isophon tweeter.

This model was marked highly and consistently on all parameters by all but one member of the panel, comments suggesting a slight dimness, a slightly woolly but reasonably extended bass, and mild mid-range coloration. The overall balance was considered smooth and the speaker was highly praised by several listeners.

The sensitivity of the unit is slightly below average, so an amplifier with reasonable power output (30–50 w.p.c.) would probably be desirable.

The review examples were soundly constructed and finished in walnut except for the rear. The bass unit and tweeter are angled w.r.t. each other to enable them to be placed close together, and situated near the bottom of the enclosure with the port above. The well-damped cabinet contains a brace between the back of the bass unit magnet and the rear wall.

Mission 710

This is the smallest of a range of speakers from a new company, Mission Electronics. It is an infinite baffle design with two drive-units, an 8 in. doped paper cone bass, with Celestion MD1000 (1 in. soft fabric dome) tweeter. The cabinet is attractively finished in walnut, has the appearance of being carefully designed and is therefore rather distinctive. The brown fabric grille covers a wood finished front which has a panel of data on the loudspeaker; construction throughout is of a commendably high standard.

The Mission is one of the cheapest speakers in the survey, and consequently must represent very good value, as its results in both objective and subjective tests were very reasonable. In the listening room the panel were again divided according to their seating position; criticisms referred to an uneven and rather distorted *hf* response, and a rather dim sound, but the bass was well defined and extended for a speaker of this size. Some coloration in the midrange and crossover region was also noted.

The sensitivity of the loudspeaker is slightly above average, suggesting that it would be well suited to a modest amplifier or receiver, which is particularly relevant in view of its own reasonable cost. The dimensions suggest that it would be equally suitable for bookshelf or stand mounting.

Rogers Compact

This is the latest of three loudspeaker designs from the revitalised Rogers company now controlled by Swisstone Electronics. This follows the pattern of BBC-influenced designs and may be considered the smaller brother of the successful Export Monitor (itself derived from the LS 3/6). In common with the Harbeth and other loudspeakers from the 'BBC school', it employs a heavily damped thin-wall cabinet of birch plywood and high quality crossover components, although, unusually, it is an IB design. Drive units include an 8 in. Bextrene cone bass/mid-range made to specification by Dalesford, and the 1 in. Son Audax soft-dome tweeter.

The panel were fairly divided on the listening tests, and undoubtedly the loudspeaker caused some unease in some of the members; as this was one of the last loudspeakers to be auditioned, we suspect the criticisms may have been prompted by accumulative listening fatigue, as they were rather vague and a little grumpy! Some coloration was noted in the upper mid-range and the *hf* performance in this room was similar to the Harbeth, which also uses the S.A. tweeter. The bass has good extension for such a modest-sized speaker, but some unevenness and mid-range coloration were noted, which may have been caused by the 'forward' sound this speaker gave.

Measurements show that this model has bass extension second only to the much larger and more expensive Tannoy, and excellent treble dispersion. Below average sensitivity suggests that it would be best suited to an amplifier of at least 40 w.p.c., while the crossover component quality should not cause any problems at high powers. The modest size and extended bass would make this model very suitable to situations where space is at a premium; it is designed for either bookshelf or stand mounting. ●

REW Sole West End

dealers for **MISSION** loudspeakers

REW are pleased to announce that we are sole West End Agents for Mission Electronics speakers. At 230 Tottenham Court Road you can audition these speakers in air-conditioned comfort in comparison with the world's best. At Tottenham Court Road we have three demonstration studios and five demonstration and display areas. You'll find the staff friendly and helpful as well as, most importantly, knowledgeable.



The following makes are on display and demonstration at REW:

Acoustic Research, AKG, Amcron, Bose, Bang & Olufsen, Cambridge Audio, dbx, Decca London, Denon, Dokorder, Fidelity Research, Gale, Harman Kardon, Harrison, JBL, KEF, Lecson, Lenco, Micro-Acoustics, Micro Seiki, Mission Electronics, Nakamichi, Ortofon, Phase Linear, Quad, Revox, Rogers Monitors, SAE, Satin, Sequerra, Shure, Sonus, Soundcraftsmen, Spondor, Stanton, Stax, Tandberg, Tannoy, Teac, Technics, Transcriptors (Michell Engineering), Uher, Ultimo, Yamaha.



EXPORT TO
EUROPE OUR
SPECIALITY

The Mission Electronics range consists of three models each optimised to give maximum performance on all types of music. The smallest of the models is the 710. A 2-way compact speaker with power requirements of between 15 and 75 watts. The 720, a 3-way system is recommended for stand mounting, and power requirements are between 20 and 125 Watts. The top model, the 730, can be used with amplifiers between 25 and 200 Watts output and is a 4-way floor standing unit. All models thus combine efficiency with high-power handling but as you will hear, do this without sacrificing sound quality in terms of colouration.

230 Tottenham Court Road, London W1. Tel: 01-637 2624/5

REW Audio Visual ©

Also at: 146 Charing Cross Road, London WC2. Tel: 01-240 3064/5.
Mail Order: REW House, 10-12 High Street, Colliers Wood, London SW19.
Tel: 01-540 9684/5/6.

Loudspeaker Distortions can we hear them?

Peter Fryer* describes a fresh attempt to match measurements and judgements

WE first became interested in the audibility of loudspeaker distortions a few years ago, prompted by some extravagant claims in the press that fractions of a per cent of such and such distortion would make an otherwise good loudspeaker unacceptable to some reviewers. We felt that technical measurements using pure sine generators or white noise flat from DC to several megahertz were rather academic, and that what we really wanted to know was: how little distortion you can hear using the real signals that the speakers were designed to reproduce. For the vast majority of people that means music—be it classical or pop—and not pure sine-waves.

Bearing this in mind we decided to find out how little of a given distortion can be heard in real music signals by electronically generating the 'pure' distortion—if there is such a concept as 'pure distortion'. Known amounts of this artificial distortion are then added to a loudspeaker which is either not producing it at all, or is being used in such a way that very little of it is produced. The artificial distortion is then reduced while switching it in and out until it can no longer be heard when added. This amount is then taken as the limit of audibility of this kind of distortion. The black boxes which produce pure distortions have uses other than simply finding their audibility—for instance, knowing how a given distortion sounds in isolation considerably aids its recognition and subsequent elimination during development work.

Since there had been some suggestions that intermodulation distortion was one of the worst in terms of sounding unpleasant, and most speakers produce some of it, we decided to tackle this first. Now, intermodulation distortion is caused by nonlinearities in the reproduction chain, and it consists of new 'unmusical'

frequencies which are added to the pure input signal during the process of reproduction. They are 'unmusical' because they are not harmonically related to the tones present in the original signal, and are therefore likely to sound unpleasant. You may expect to be able to hear very tiny amounts—unlike some orders of 'harmonic' distortion which often add more of what the musical instruments themselves produce in any case. Amplifiers have been adjusted to produce switched amounts of crossover distortion in the past' when 6% was found to be the audible limit in music.

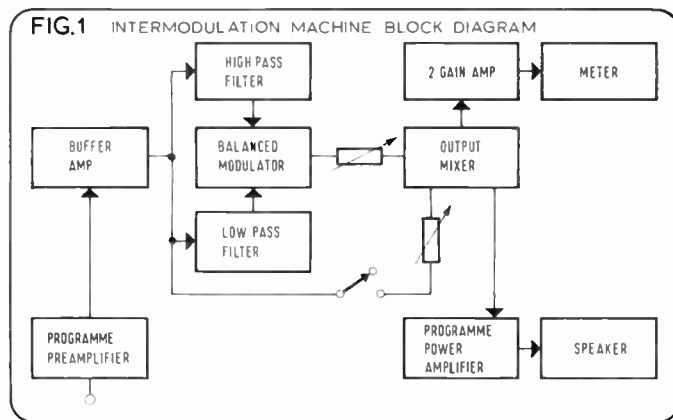
But how do you put a switch on a loudspeaker to produce known amounts of intermodulation or doppler or some other distortion exclusively, without giving rise to other distortions at the same time which would be bound to cloud the issue? In the case of intermodulation, a balanced modulator can be used to give first order components—these being the high frequencies in the music signal plus and minus the low frequencies in the same signal (see fig. 1). The first thing we noticed on listening to Intermodulation Distortion was just how awful it sounded, but frankly it did not sound much like a loudspeaker fault at all! Rather it sounded like a mistracking pickup cartridge or a very small transistor radio straining to be heard. The second thing we noticed was that with most kinds of music it required as much as 5-6% to be detectable, and the kind of signal which was most sensitive to this particular distortion was piano music, particularly Liszt's Piano Concerto No. 4, which required only 2%. The situation changed radically of course when two pure tones were used, and 0.1% was indeed measured as detectable when conditions were right.

Several different types of music and 'classes' of listener were used in the listening tests and there were pronounced

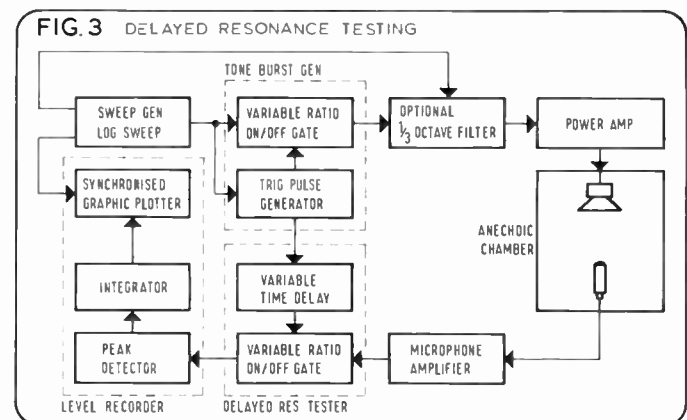
differences in detectability with different listeners. 'Skilled' listeners such as audio engineers and people who like listening to a lot of classical music were able to detect half an order of magnitude less distortion than those who listened to pop music and were not in the business of designing speakers for a living. Since at normal listening levels less than 1% intermodulation distortion is produced by most good quality loudspeakers, the results indicate that it is not a particularly serious issue for designers or users, and it seemed prudent to concentrate on those distortions which we can actually hear in loudspeakers—but once again, which are they?

One distortion was uncovered a very long time ago by Shorter at the BBC and he called it 'delayed resonance'. It transpires that this is one of the distortions which you can actually hear, but mainly because most speakers produce lots of it. This distortion can best be described as 'the speaker carrying on broadcasting when the programme has long since finished' and it is caused by small areas of the diaphragm assembly storing energy while the music is present and giving it out again continuously even when the music has ceased (see fig. 2). It is possible to measure Delayed Resonances in a number of ways, one of which is quite complicated, involving the use of computers, impulses and Fast Fourier Transforms. The other way, which gives similar results, is rather simpler but takes longer (see fig. 3).

This method involves the use of the same impulse repetitively. The speaker's response to this is passed through a gate which is arranged to cut off progressively more and more from the beginning of the speaker's response to each input impulse. The gate output is then passed to a narrow band heterodyne analyser whose output is used to plot the cumulative decay spectra. Alternatively, a tone-burst swept in



* Measurement Engineer, Rank Leak Wharfedale



GLASGOW

The
**SCOTTISH
DEALER**
for

Keesonic
FULL RANGE

on permanent demonstration

Talisman Hi-Fi

111 STOCKWELL STREET
GLASGOW

Telephone 041-552 1043



**DON'T LISTEN TO OUR SALESMEN
LISTEN TO OUR**

Keesonic 

LOUDSPEAKERS!!

THE FANTASTIC
NEW BOOKSHELF MODEL
40 watts handling

The KEESONIC KUB

ONLY **£62.50** pair inc. VAT.

OTHER MODELS IN STOCK
K.R.F. and KBM Monitors



BERKSHIRE HI-FI

125 BRIDGE ROAD, MAIDENHEAD

Telephone: 27760

9 THE MEADWAY PRECINCT, HONEYEND LANE

READING Telephone: 582988

179 VICTORIA ROAD, ALDERSHOT. Telephone: 314856.

Also SOUND SYSTEMS, 49 King Street, MAIDENHEAD.

Telephone: 32796

Come and listen to the NEW

Keesonic 

KUB

BOOKSHELF LOUDSPEAKER

Musical Hi-Fi!

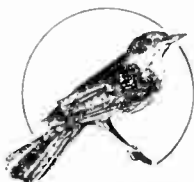
*These Loudspeakers may not be large, but they do
produce some of the most neutral, musical sounds
that we have heard.*

Available from the only Sussex dealer at:

£62.50 per pair inc. VAT

JEFFRIES HI-FI

4 ALBERT PARADE
GREEN STREET
EASTBOURNE
Eastbourne 31336
(STD Code: 0323)



A LITTLE DIARY FOR A LITTLE SPEAKER!

The KUB **Keesonic**

A Very Smooth Sound for a Loudspeaker a
fraction larger than its Hungarian competitor!
Its British and its available NOW! from us at

£62.50 pair inc. VAT

MRS BEAN Sound
Systems

4 STATION LANE PRECINCT
FEATHERSTONE, PONTEFRAC
W. YORKS.

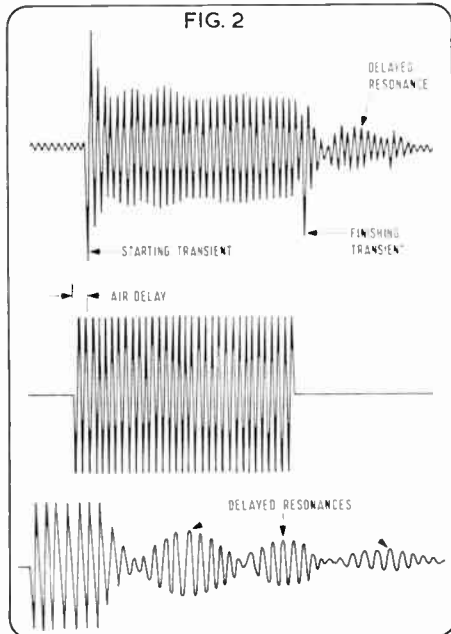
Telephone: Pontefract 76178

Southern English currency accepted

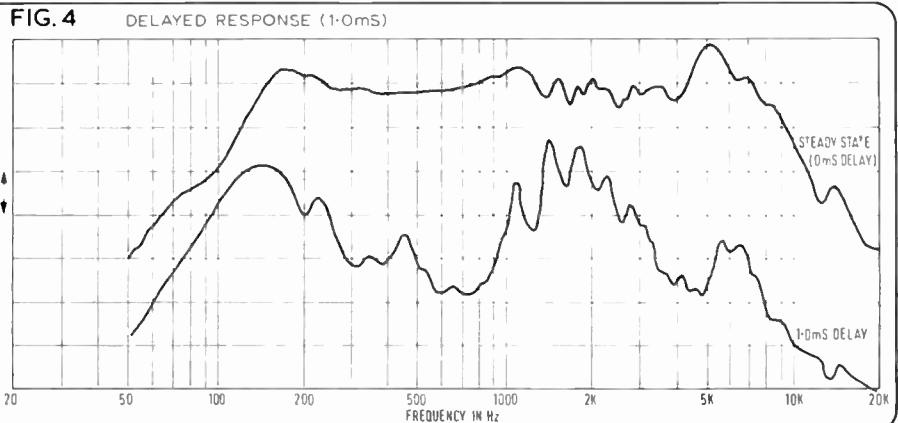
Also the K.R.F. and the K.B.M. Monitors
stocked. Do your ears a favour and listen to one
of the most accurate and well designed loud-
speakers available.

AND THEY'RE BRITISH!!

synchronism with the analyser frequency can be used in place of a 'fixed' impulse. The former, of course, has most energy in the narrow band around the analyser frequency, while the latter has even energy throughout the audio band. This gives a number of curves showing how much the speaker continues to radiate at various frequencies, so many milliseconds after it has supposedly been switched off, and these curves often show peaks and dips which do not occur on the normal steady-state frequency response curves. Numbers of these curves can be built up into a 3D map very similar to the Cumulative Decay Spectra employed by KEF Electronics, and this gives a complete picture of the frequency and time behaviour of the loudspeaker (see fig. 4).

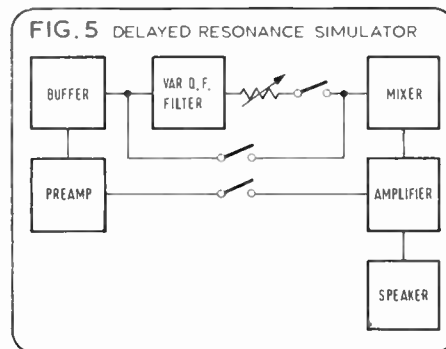


Having obtained our peaks and dips giving a measure of this delayed resonance distortion, what do they tell us? In common with other measured distortions, we have no idea how audible they are. To find out, a second distortion simulator was built to introduce these delayed resonances into another perfectly good loudspeaker (see fig. 5). Prior to carrying out the experiments we had supposed that resonances which were sharp and high, and therefore would ring away for the longest period of time, would be the ones which could be heard the easiest and would therefore be the most objectionable. Once again, these preconceived ideas were proved wrong in practice and these results confirm those obtained at the BBC and in a recent article in *HFN/RR*². Fig. 6 relates the audibility of resonances of different Q value over the audible frequency spectrum against a background of wide-band noise, orchestral music and 'pop'. It seems that since they cover a larger slice of the audio spectrum, low Q resonances are excited for a greater proportion of the time, whereas sharper resonances are very rarely excited at all by program music. When the peak becomes very flat (Q less than 1) the effect



is one of an increase in loudness over a large proportion of the audio band, and if this loudness increase is compensated for, these very low Q resonances become less audible. They are in any case less objectionable than those having Qs between 1 and 5.

As with other kinds of distortion, there is a test signal which exposes delayed resonances with greatest ease. For intermodulation the test signal consists of two pure tones; for crossover distortion it is a single pure tone, and for delayed resonances white (or pink) noise is most effective. Once again, with its own test signal this kind of distortion may be heard up to an order of magnitude more easily than with program music. Taking a few results at random from fig. 6, peaks having a Q of 25 at 1 kHz have to be about 4 dB above the response curve before they can be heard in pop music, whereas peaks having a Q of 1 can still be heard when they are 12 dB below response curve level. With white noise this figure would be closer to 25 dB. Classical music gives rise to figures just above mid-way between these two extremes. The fact that audible amounts of Delayed Resonance are produced by most loudspeakers makes this possibly the major form of loudspeaker distortion.



The next kind of distortion which we decided to tackle is very controversial, with some experts saying it is totally irrelevant and inaudible while others say that it is very important indeed, and that minute amounts completely destroy the musical experience. This distortion is of course Doppler distortion. Now it is quite true that speakers do indeed produce this distortion, and the smaller the speaker and

the wider the frequency range that it covers the more of this distortion it will produce—that is if the music used is suitable for its production at all! Now, Doppler distortion occurs as follows: consider a speaker reproducing two frequencies at once, 100 Hz and 10 kHz. During each half cycle of the 100 Hz the same speaker reproduces 50 cycles of the 10,000 Hz. During the first half of the low frequency cycle the diaphragm is getting nearer to the listener and 50 cycles of the 10,000 Hz have progressively less and less distance to travel to the ear and so take less and less time to get there. During the next half cycle the diaphragm is going further and further away from the listener, and so the second 50 cycles have progressively more and more distance to travel to the ear and so take more time. Thus the first 50 cycles are 'squashed up' and their frequency is increased and the second lot are 'stretched out' and their frequency is decreased. Now, we can exactly simulate this effect using a 'bucket brigade' delay line (see fig. 7).

This device delays the whole audio signal by an amount which depends on the frequency of an external oscillator, and by varying this oscillator frequency in accordance with the Doppler formula we can cause the length of the delay, and hence the apparent position of the loudspeaker, to change in exactly the same way as a moving loudspeaker diaphragm. Thus, we can electronically simulate the changing position of the loudspeaker diaphragm in response to the lower audio frequencies, and with the particular device which we built we can simulate a total cone movement of 150 mm (ie ± 75 mm). So with open minds, not knowing which of the two camps of opinion was more nearly correct, we fed passages of music containing very low organ notes from Saint-Saëns Symphony No. 3 (CBS—SBRG72132) through the simulator into a 4-way speaker which would produce very little of this distortion itself.

Our 'doppler control' makes the same sound power output appear to come from a smaller and smaller full-range loudspeaker because it increases the effective cone excursion for a given power output. The first thing we noticed when listening to this distortion box was that most of the time there was not enough low frequency

WHY GUILDFORD HI-FI HAS A NUMBER OF PROBLEMS

SALESMEN Sales personnel at this establishment have a disconcerting habit of treating the customer as though they were human beings and capable of rational actions. On occasions they have even recommended equipment when it was not in stock. They have even recommended that customers listen to the equipment in their own homes prior to purchase.

LOCATION This shop is unwisely located more than twenty miles from Tottenham Court Road out in the wilds of Surrey. Customers are even allowed to park within walking distance from the shop. This is unfortunate since the customer is not completely exhausted upon entering the shop, and might not purchase the first item that is thrust at him.

PRICES Prices at this shop tend to be higher than those of well-known discounters. They try to justify this devious practise by offering generous trade-in allowances, hire purchase facilities, delivery, installation, home demonstrations, and an extravagant guarantee.

BRAND NAMES There is a genuine dearth of the reassuring, well-known, household brand names at this establishment. Instead they make the iconoclastic and highly improbable claim that many of the smaller, less touted manufacturers make equipment that actually sounds better, costs less, lasts longer, and represents a better value for money than the well-known brands.

TECHNOLOGY This is going to be hard to believe but this shop actually stocks valve equipment. Everyone knows that valves have been dead for the past ten years. And no wonder; they are bulky, They are noisy, They get hot, They wear out. Their technical specifications are inferior to solid-state designs, And to top it all they cost more than transistors. But these guys say that although this is true, valve equipment still sounds superior to transistor equipment and they intend to cater to people who care about hearing accurate music reproduction rather than those who are interested in mere technological innovations. To show that they mean business they now stock such outlandish brands as dB Systems, Paragon, Futtermans, Lux Valve equipment and they threaten to bring in even more esoteric gear in the future.

GUILDFORD HI-FI

270 HIGH ST, GUILDFORD, SURREY Tel. 71534

WHERE MUSIC MATTERS

SPEAKER STANDS

ADJUSTABLE ANGLE 2-PIECE STANDS IN CHROMED STEEL

The most attractive styling and superb finish make this new improved version a must for anyone owning small to medium sized monitors. A simple adjustable angling mechanism enables you to not only alter the position of your speaker but also the sound obtainable (i.e. if the speaker was adjusted angled towards the ceiling of your room a much lighter sound is obtainable). These stands are the only type to incorporate such a feature. The speaker itself sits in an insulated cradle held there by strong adhesive pads so there is no need for screws whatsoever. Experts all agree on the need for stands, please try a pair with our guarantee of a 'no quibble refund' and genuinely hear the difference. The stand sits a speaker 8" from the floor and accepts speakers from 13" high to approx. 28".

Send cheque or P.O. to:—

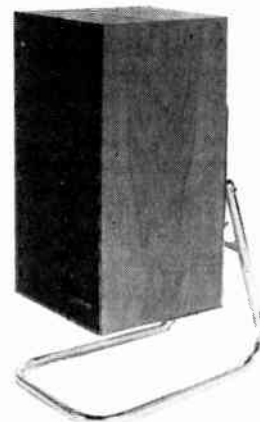
H & H HI-FI

**9 NETHERFIELD CLOSE
BURNLEY, LANCs.**

Telephone: Blackburn 56511

Price £19.95, plus £1.50 Post & Packing

Allow approximately 14 days delivery



Keesonic

Audio Developments Ltd., Halldore Hill,
Cookham, Maidenhead, Berkshire.

Telephone: Bourne End 22726

*For a full dealer list
please contact us
at the above address*

UNILET Your
UPL CELEF dealer

SOUND ADVICE AT A BETTER PRICE

Unilet Products Ltd.,
35 High Street, New Malden, Surrey KT3 4BY. 01-942 9567/8

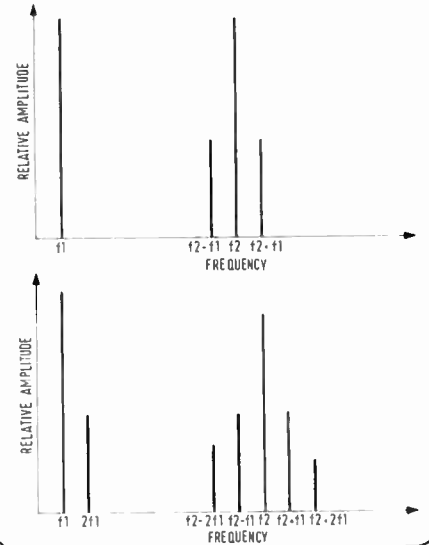
energy in the music signal to produce any audible effect at all—even with the simulator at maximum. However, when the low organ notes came on and 'shook about' the higher frequencies present in the music, 'moderate' amounts were not particularly unpleasant, tending to give the same kind of vibrato effect that opera singers practice for years to achieve, and the detectability was about half that for intermodulation distortion.

When it comes to expressing percentages, in absolute terms, of this distortion we run into several problems in the method of approach. For a given magnitude of 'dopplering action' we can either express the distortion as a percentage frequency shift, in which case the percentage will be constant whatever the upper frequency being shifted around, by virtue of the mechanism of its generation. Or we can express the amplitude of the extra frequency components or 'sidebands' which appear as a result of the doppler action as a percentage of the upper frequencies' 'unshifted' amplitude, and this is the way it is usually expressed (Beers & Bela³) (fig. 8 shows the side-bands produced). In this latter case the percentage increases as we increase the upper frequency; e.g. if we are feeding our 100 Hz and 10 kHz to the speaker, the 10 kHz would experience twice the distortion in terms of sideband amplitude that a 5 kHz note would experience, and so on.

It is this dependence of the distortion factor on the actual value of the upper frequency which makes giving percentages of distortion in music difficult, though of course the percentage frequency shift is unaffected. It turned out that the basic Doppler machine could be used easily for pure tones (the specific test signal for this kind of distortion), when use of the formula and knowledge of the simulated amplitude showed that round about 0.2% of upper frequency amplitude distortion was detectable at 4 kHz, corresponding to 0.0015% of frequency shift. But the formula could only be used for assessing music which nearly consisted of two pure tones itself—like a track from *Tubular Bells* (Virgin V2001) when it showed that about 5% distortion of the upper frequency was detectable.

To obtain an absolute value of the 'sideband' distortion, another delay-line was set at the 'idling length' of the first and its output used to cancel out the 'carrier' (or non-shifted upper frequencies), thus leaving only the new frequencies created by the Doppler effect. These could then be measured as a percentage of all frequencies present in the music signal and would give us an absolute value of the Doppler sidebands. Fortunately in the case of *Tubular Bells*, this figure turned out to be more or less the same as that calculated by assuming it consisted of two frequencies alone. In the case of organ music about 8% was just detectable. It turns out that all

FIG. 8 THE SPECTRUM OF THE OUTPUT OF A LOUDSPEAKER SUFFERING ONLY FROM FREQUENCY INTERMODULATION DUE TO DOPPLER HARMONICS ARE ALSO SUBJECT TO THE DOPPLER EFFECT.



loudspeakers, with the possible exception of tiny cones handling the complete audio range, will never produce enough Doppler distortion to be audible on program material under domestic conditions, and even single full-range units, if they have a relatively

FIG. 7 'CARRIER CANCELLING' DOPPLER MACHINE

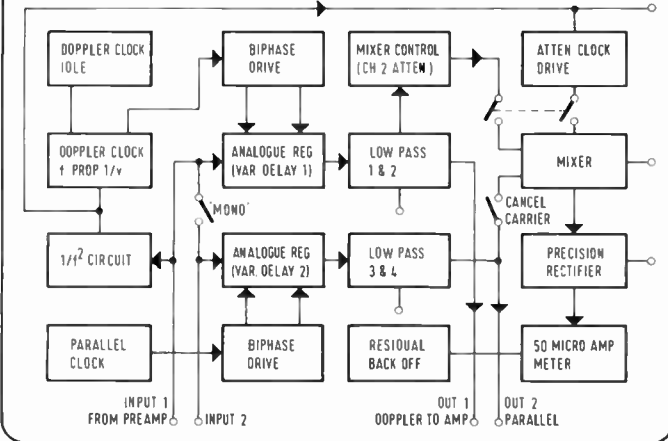


FIG. 6 DELAYED RESONANCE AUDIBILITY CURVES

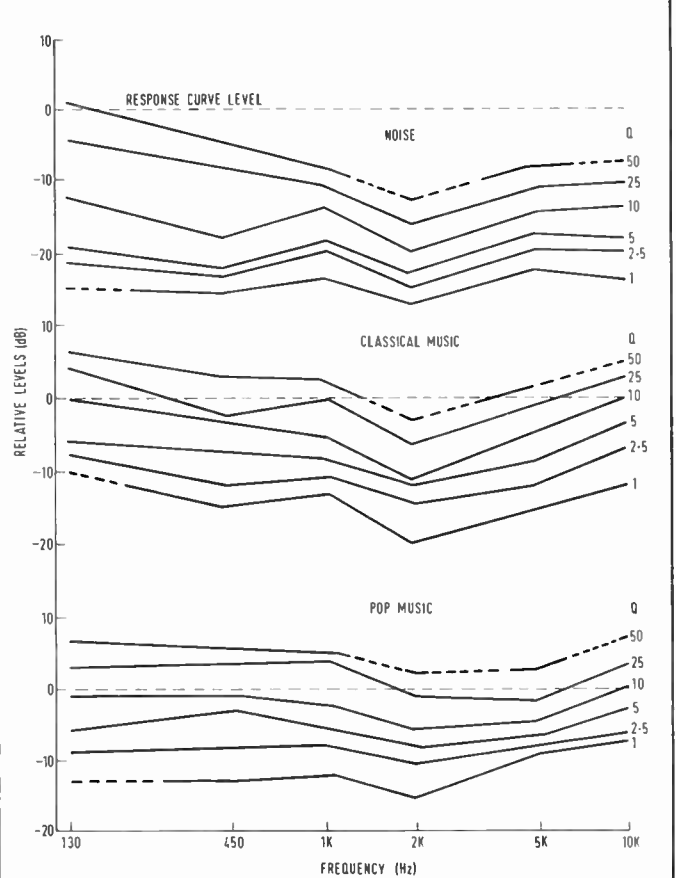
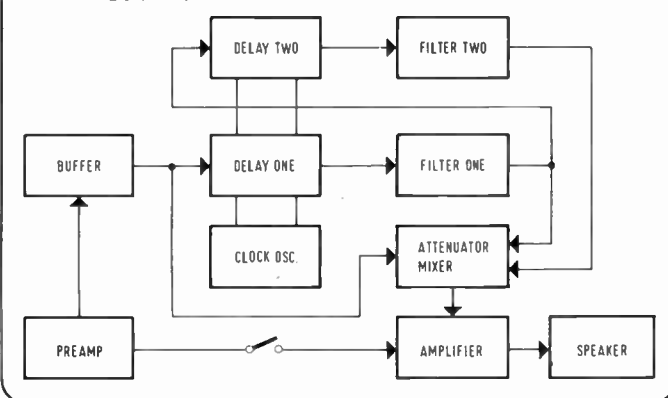
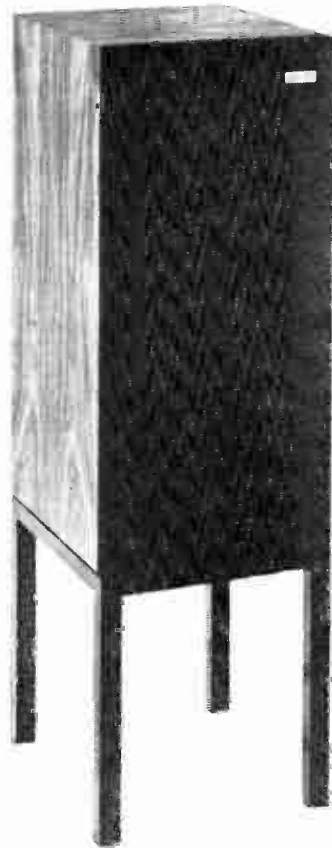


FIG. 9 BOX RESONANCE SIMULATOR BLOCK DIAGRAM



NEW FROM CELEF



When you listen to your present loudspeakers, presuming they are of high quality, how much information do you lose in low efficiency and distortion? Let's quote some specifications of another manufacturer's loudspeaker which is regarded as one of the best.

Speaker X

Power Handling: 50 watts programme
 Efficiency: 20 watts gives 90 dBa
 Distortion: less than 1% typical 5% under 100 Hz for 90 dBa
 Freq. Response: 50 Hz-20 kHz \pm 3.5 dB

Now compare the Mini Professional S.M.

Mini Professional S.M.

Power Handling: 100 watts programme
 Efficiency: 3 watts gives 90 dBa
 Distortion: less than 0.5% including frequencies down to 50 Hz for 90 dBa
 Freq. Reponse: 50 Hz-20 kHz \pm 3 dB

But, specifications have to be backed with low co'or-ation and accuracy—so read on:—

Manufacturers tell us that a good (accurate) speaker should reproduce all types of music faithfully, but it seems that up till now this has not been so. How often have reviewers used the phrases 'suitable for classical only', or, 'slightly coloured but efficient, making it ideal for loud Rock'?

CELEF has broken this myth. With the new Mini Professional S.M. it has everything to offer people who appreciate all types of music. It will reproduce Chamber Music with the delicacy of a Broadcast Monitor, reproduce full Symphony Orchestras with outstanding clarity, and play heavy Rock as loud as your neighbour can stand it.

Why not compare the new Mini Professional S.M. with any other speaker, regardless of cost or construction? You will find that at last there is a speaker that will reproduce all types of music accurately, and at realistic levels.

large cone and hence relatively little movement, will very rarely give even a detectable level of this distortion, which corresponds to a total cone movement of about 10 mm. Having perhaps taken some of the steam out of the Doppler argument, we went on to consider another kind of loudspeaker distortion.

Even when we had reduced 'delayed resonance' distortion to below measured audible levels, we could still hear other sounds, which would certainly not have been in the original programme. We felt that perhaps some of these remaining sounds were due to reflections from within the cabinet, or from the loudspeaker chassis etc., which eventually find their way out of the box and through the cone, where they will detract from the sound which is being radiated directly. So, using once again our well tried approach, we decided to simulate some of these reflections electronically, and at the same time design an instrument for measuring these reflections so that the results gained could actually be used in the design of loudspeakers.

The simulator once again relies on 'bucket brigade' delay lines, but this time they are much longer and are capable of simulating delays up to several metres in magnitude, rather than the 150 mm of the Doppler machine. By using two delay-lines and an appropriate clock, two reflections could be added to the original sound, corresponding to a box depth range of 90 mm to 3 mm, with a second reflection coming from twice as far away. The Doppler machine was also pressed into service as a simple delay-line, thereby extending the range smoothly down to 9 mm to simulate reflections from magnets, chassis, etc. An attenuator in the 'reflection path' allowed us to simulate different amounts of absorption in the box and through the loudspeaker cone (see fig. 9). The sound which this box produces is most interesting, with large delays sounding like a drain pipe and short delays giving effects quite similar to delayed resonance. However, the most interesting sound occurs with the reflected and direct sound at similar levels when the control which determines the size of the box is actually being altered. The sound produced is exactly the same as the 'phasing' effect which is used on some pop records, or the distortion which occurs on some long distance medium wave transmissions—but it has to be admitted that this is a distortion which does not yet occur in real loudspeakers and is waiting for someone to design an all-rubber blow-up loudspeaker enclosure.

This simulator is practically unique in confirming what we more or less know already, but it does give a quantitative measure to answers which were previously only subjective. The answer is that small boxes are worse than big boxes! Or to put it another way, there has to be more absorption in small boxes than in big ones for the reflections to be inaudible. Of course, as the box becomes smaller it becomes more difficult to increase the absorption anyway, so it seems that bigger will probably always be better. Actual levels of audibility show with white noise—which

is the particular test signal for this distortion—that -25 dB is just audible for a reflection in boxes bigger than 150 mm deep. For pop music, however, as little as 10 dB attenuation is sufficient, and classical music needs roughly the same. Boxes smaller than 100 mm deep need the reflections attenuated by more than 25 dB for inaudibility, and the audibility of reflections increases markedly as the distance is reduced below 10 cm or so.

A simple modification of the delayed resonance measuring apparatus enables us to measure the reflections which are actually produced by speaker enclosures, chassis, etc. Instead of plotting frequency response curves for different times after the speaker is switched off, the output is plotted against time after switch-off for a given frequency. A series of these 'time axis plots' taken at different frequencies can be built up into another 3-D surface, once more analogous to cumulative decay spectra, and peaks occurring at many different frequencies at the same delay are almost certainly due to reflections. Thus the measured amplitude of the reflections can be compared with the audibility curve produced with the aid of the simulator, and it can be ascertained if any action needs to be taken in this direction.

There are still a number of distortions which can benefit from this interesting line of approach. There is diffraction for instance, and then simple harmonic distortion, which is, peculiarly enough, one of the most difficult to generate purely, and other orders of intermodulation distortion which are also quite difficult to generate.

Thus we see that for those distortions which actually produce extra tones, like intermodulation, Doppler, crossover, and I suspect, harmonic also, the audibility lies

somewhere between 2 and 6% in program music, though their own test signals allow as little as 0.1% to be detected. Those distortions which modify the response in some way, like delayed resonance and box reflections, are far less sensitive in that -15 dB is the least which can be detected in music, which corresponds to about 13 to 15 per cent, though with their own test signals this comes down to -30 dB or 3 to 5%.

However, speakers produce more of these latter kinds and they are the most significant form of distortion investigated so far. The main conclusions which we can draw from this are firstly that the 'easily measured' distortions like Intermodulation, Doppler, etc, are not likely to be a problem with most 'hi-fi' loudspeakers. Being able to hear these distortions 'raw' has shown that what some reviewers claim to hear as 'intermodulation', for example, may be something else as yet not tied down, or perhaps perfectly reproduced imperfections in the disc, the microphone or original sound itself. This work also shows that less commonly measured distortions such as Delayed Resonances, Box reflections (and I suspect diffraction effects also) are the major reasons that speakers sound both different from one another and from the original sound. In conclusion, we can think ourselves lucky that the ear allows music to mask the worst effects of most distortions, otherwise the job of the loudspeaker designer would be that much more difficult. ●

References

1. R. Carver. *Stereo Review*, May 1973. Pp. 72-75.
2. W. R. Stephens. *HFNI/RR*, Sept., 1976. Pp. 87-97.
3. G. L. Beers & H. Bela. *Proc. I.E.R.* Vol. 31, No. 4. Pp. 132-138 (1943).



Peter Fryer at work with Bradford built and B & K equipment.

AZAT

We have 50 pairs of speakers on permanent comparative test. We also offer the most competitive prices to be found anywhere!!

Always a very comprehensive stock available

A.R., CELESTION DITTON and UL, CERWIN VEGA, J.R., KLH, LEAK, MARANTZ, PIONEER SANSUI, SONY, TECHNICS, TANNOY, WHARFEDALE.

Access, Barclaycard, American Express, H.P. Mail Order

61 CHARLOTTE STREET, LONDON W1
Telephone: 01-580 4632

NEVER MIND THE QUALITY, FEEL THE WIDTH

No, not really our slogan, in fact we mind the quality very much. We do not mind the width or the looks, if the equipment sounds more musical and is reliable.



LINN SONDEK LP12

We do exchange loudspeakers after purchase if necessary.

LISSON — GRACE — SUPEX — NAIM — NIGHTINGALE
REGA — ROGERS — DAHLQUIST — J. E. SUGDEN
FIDELITY RESEARCH — MICRO ACOUSTICS — AIWA
A.R. — TEAC — ORTOFON — CELEF — FONS
TANGENT — KEESONIC — W.A.R. — NYTECH

W. A. BRADY & SON

401 SMITHDOWN ROAD, LIVERPOOL 15

Telephone: 051-733 6859

CLOSED ALL DAY WEDNESDAY

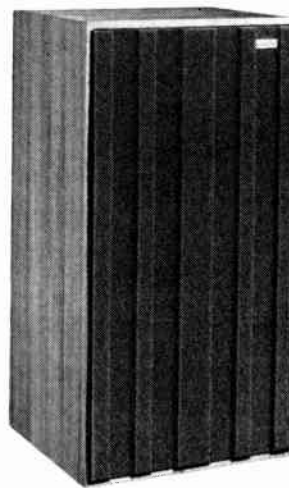
HARBETH ACOUSTICS

2A NOVA RD. CROYDON, SURREY, CR0 2TL

announce

Type HL Professional Monitor Loudspeaker

with the revolutionary new patented* polypropylene copolymer bass/mid frequency cone giving a clearer less coloured sound particularly in that most sensitive middle frequency region than any other known material.



Dimensions: 63.5 cm (25 ins) high × 32.5 cm (13 ins) wide × 30 cm (12 ins) deep.

Axial Frequency Response: 50 Hz to 25 kHz ±3 dB

Power Handling: 100 watts programme.

Sensitivity: 87 dB per watt at 1 metre.

Nominal Impedance: 8 ohms.

Units: 20 cm (8 ins) dia. L.F. unit of specially vacuum formed polypropylene copolymer and 2.5 cm (1 in) dome HF unit of soft impregnated fabric.

Crossover Network: Close tolerance laminated iron inductors and solid dielectric capacitors. Adjustment of relative levels of L.F. and H.F. units to ±½ dB by means of tapped auto transformer.

Cabinet: Vented cabinet of heavily damped panels to satisfy BBC criterion. Vent resonance 45 Hz.

Price £135 + VAT (Teak) £136 (Walnut)

Enquiries invited from the trade.

* Patents applied for in all principal countries

IN March the Committee on Copyright and Designs Law, chaired by Mr Justice Whitford, finally published its report (HMSO £4.10), after spending two-and-a-half years and over a hundred meetings considering oral evidence and some three hundred written submissions. The main conclusion was that British Copyright Law as it stands is 'complex and confusing'. As far as this country's allegiance to international conventions permits, the Government will sooner or (more likely) later introduce legislation to update and rationalise the laws in this area.

One recommendation of the Whitford Committee that is likely to be of special interest to audio and video people, amateurs and professionals alike, is that a levy should be charged on the sale of all tape recording equipment. This is in conformity with the so-called 'German system', whereby a tax on the price of tape recording hardware raises revenue which is regarded as a licence for the owner to make recordings of copyright material. So far, the introduction of such a levy scheme in the UK has been considered impractical, the main reason given being that the revenue raised would be

too difficult and expensive to distribute to the copyright owners entitled to it. But already blanket schemes have been introduced here, whereby amateur recording enthusiasts and home movie makers can voluntarily buy a licence to dub commercial recordings onto tape or film. Doubtless these have paved the way to adoption of the system proposed by the Whitford Committee, whereby everyone who buys a tape recorder buys a licence to use it, whether they like it or not. In this context it is easy to forget that practically the only legal musical use to which an unlicensed tape deck can be put is the original recording of original material by an amateur artist—in effect the recordist singing his own compositions in the bath.

Although the Whitford proposals, if adopted, will do something to reward copyright owners for revenue losses incurred when an individual tapes a broadcast or a gramophone record borrowed from a library

or a friend, no solution to the much more serious problem of piracy on a commercial scale has yet been found.

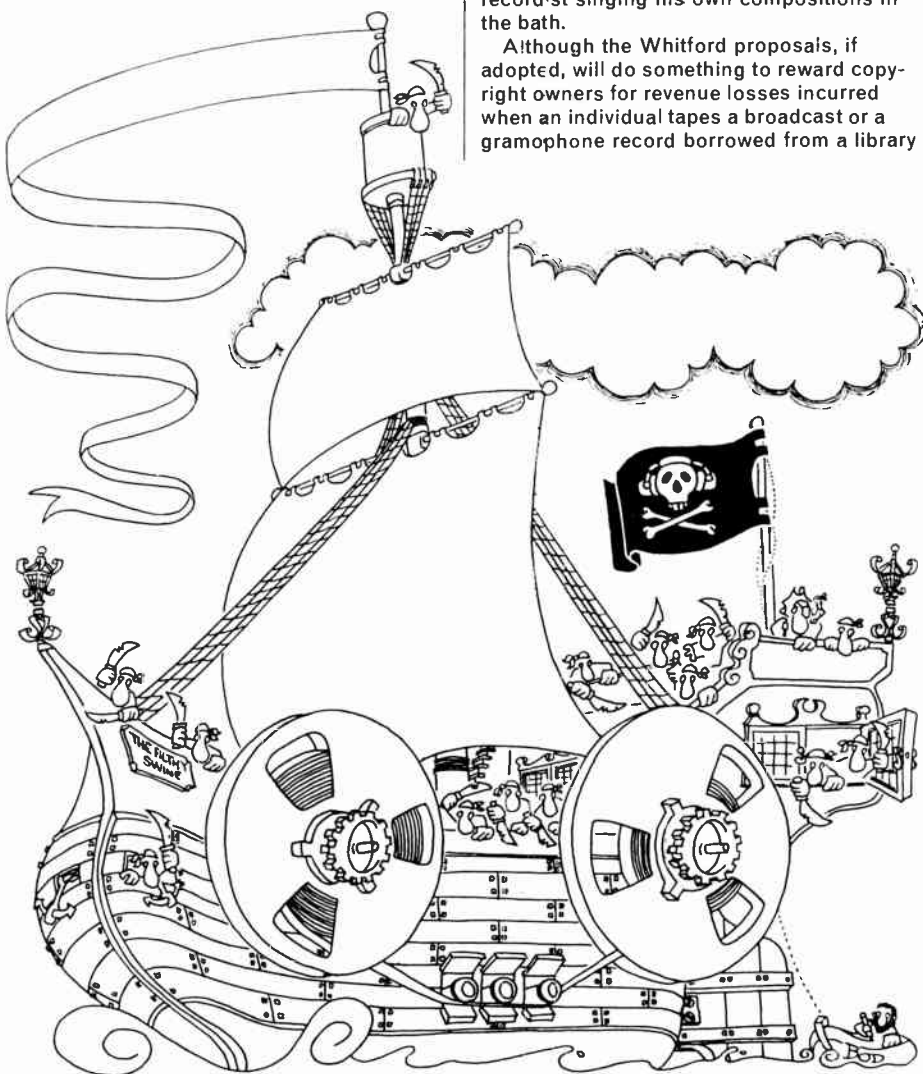
A few years ago pirate recordings, for instance bootleg versions of the Dylan *Basement Tapes* and Pink Floyd's *Dark Side of the Moon*, sold like hot cakes. Such recordings made no bones about being bootlegs. Indeed that was, for many people, their main attraction. There seemed to be something rather exciting about laying one's hands on a record of which the artist for some reason or another did not approve. But gradually, through a combination of circumstances, bootlegs have disappeared. Legal prosecutions were brought against bootleg distributors, pop groups started employing very heavy stewards to hunt out and literally stamp on anything resembling a Uher recorder spotted in a concert audience, and even the most avid bootleg buyer finally grew weary of paying high prices for extremely low-fi recordings.

But now there is a quite different type of problem. Pirate recordings are being 'got up' either to mimic legitimate releases on well-known record labels or to appear like legitimate competition. In other words, a pirate recording stolen, say, from an EMI original, may either be packaged to look like an EMI recording, or packaged in a sleeve with an authentic-sounding company label, which company is in fact not authorised by EMI to trade in their recordings. In neither case does the artist, EMI, or anyone else in the production chain (other than the bootlegger and his commercial outlet) receive any rewards. Where the aim is to fool the public into thinking that the bootleg recording is an EMI (or for that matter other name label) release, the pirated recording is usually a straight undoctored copy of the legitimate original, albeit in inevitably somewhat reduced-fi. Where release is on a phoney label an attempt may be made to disguise the true origin of the material; for instance the pirate may dub applause or even extra instruments onto a copy of the legitimate original, and issue the copy as a concert recording or an 'alternative take'.

Obviously both these new pirate sales techniques are far harder to detect and prove than the original, blatant, bootleg activities. The British Phonographic Industry (the recording industry trade association) have nevertheless taken numerous court actions and achieved a reasonable degree of success, as a result of pure detective work. But it is generally recognised that a final solution to the problem of professional piracy must rely on technological aids. In other words, to stop professional piracy it is necessary

Record Piracy

Adrian Hope looks at Prevention, Detection & Deterrence



Great news from **JEFFRIES HI-FI**

We are pleased to announce two new ventures from our now well-established Eastbourne showroom. Firstly the opening of extra listening facilities in Eastbourne in the form of a new room with a domestic environment which will house several items of the best equipment we can find in the high price range and will be available by appointment only, for concentrated listening and comparison tests. A new member of our team, Julian, has joined us, and along with brother Nick, will be at your service for the highest degree of consultation and advice.

Coupled with this venture, we are also pleased to announce a further branch opening in Devon, only a short distance from Exeter, again offering a consultancy service on the equipment with which we are now well renowned for.

This is being run on an appointment only basis and Mike and Graham are in charge of this south west sound studio.

If you have any difficulty in choosing your system, or require any help or advice, then contact your nearest branch and we will do everything in our power to ensure complete satisfaction.

All equipment subject to full 3 years parts and labour guarantee

Naim, Linn-Sondek, Nightingale, Dahlquist, Supex, Grace, Rega, A & R, Lecson, Sugden, Radford, Rogers, etc., etc.



**JEFFRIES HI-FI,
4 ALBERT PARADE,
GREEN STREET,
EASTBOURNE
Telephone: 0323 31336**

**JEFFRIES HI-FI
(South West) LTD,
GULLIFORD HOUSE,
KENTON, near EXETER
Telephone: 0626 863604**



the new D40 amplifier

spendor

When the Spendor BC1 (probably the most copied loudspeaker in the country) was first produced it was a major step forward in loudspeaker design, and has led the market in high quality sound reproduction for the past seven years.

The research and development which produced the newest edition to the Spendor range of loudspeakers, the SA1 Mini Monitor, reviewed in *Hi-Fi News* in the May issue, has led us to the design of an even better low frequency unit for the BC1, giving improved bass control, higher power handling capability and smoother transition characteristics in the cross-over region.

Spendor is the major supplier of quality monitoring loudspeakers to the U.K. Broadcasting Organisations and, according to an independent survey the second most popular British loudspeaker system used in the recording industry.

To complement our loudspeakers we offer the first Spendor stereophonic amplifier, the D40, giving 40 watts per channel and designed to be compatible with the BC1 and SA1 loudspeakers.

Spendor Audio Systems Ltd, Station Road Industrial Estate, Hailsham, Sussex

either to make the physical act of illegitimate copying technically impossible, or make the technical detection of such illegitimate copying unambiguous. Unfortunately, and despite considerable efforts on the part of some sectors of the industry, little real headway in practical terms has yet been made in either direction.

If any record company could have its wildest dreams come true, every disc or pre-recorded tape which was released and sold to the public would self-destruct, refuse to play, or produce unacceptable sounds whenever an attempt was made to copy it. So far 'anti-copy' is an impossible dream, but it continually captures the imagination of inventors. This is partly because of the enormous cash rewards that would be paid for a workable system and partly because one red-herring possible answer is continually being re-invented. The last major re-invention was in 1967 and 1968, when the Beatles Electronics company, Apple, and an inventor by the name of 'Magic Alex' Mardas filed three patent applications and leaked to the press stories of a revolutionary new anti-copy system. Any attempt at tape recording a disc pressed according to the Apple system would, it was claimed, result only in a high pitched whistle on the copy. The lay public was entranced with the idea, and saw the Beatles as the richest men in the world, if not the universe. But the patent applications were allowed to die, the publicity died down, and Apple Electronics disintegrated. Although dead patent applications are never published and details of the idea thus remain secret, it is a safe bet that the idea behind the Apple system was to record an ultrasonic carrier frequency on a disc recording so that when any attempt was made to dub the disc onto tape, the disc carrier would beat with the tape recorder ultrasonic bias signal and impress an audible whistle on the copy recording. Something very similar can happen if you transmit a CD-4 quadraphonic disc on FM stereo radio without filters. In each case, two frequencies, inaudible in their own right, combine to produce an audible frequency.

It requires only a few minutes' thought to see the snags inherent in the system as a deterrent to illegitimate copying. To produce a beat of audible frequency with the very high bias frequency of a tape recorder requires the impression of a very high frequency carrier on the disc. The studio cutting machine won't cut it, the factory presses won't press it, and would-be recordists' gramophone cartridges won't reproduce it. Apart from anything else, it can easily be filtered off at any stage of the production and reproduction chain, either intentionally or otherwise, and with no loss to audio quality, because the signal being filtered off is inaudible anyway. Doubtless there are other snags to the system, but those are more than enough to be going on with, and should be sufficient to discourage anyone with an inclination to reinvent ultrasonic anti-copying yet again. They also doubtless accounted for the demise of Apple's patent applications.

Curiously enough, some *video* anti-copying systems do work—up to a point.

Remember that when a feature film is copied, for instance as a cassette for legitimate screening on a ship or oil rig, or transmitted by the BBC or ITV as part of normal programming, there is a real risk that someone will take a copy (either by machine-to-machine dubbing or direct off-air recording) and produce a batch of duplicates for sale or hire at cut price. (It isn't only feature films that are pirated in this way. There is, for instance, a rolling Middle East trade in duplicate pirate versions of *Match Of The Day*!) Although there is nothing that can be done to prevent anyone from recording a transmitted programme, and subsequently duplicating their recording, professional tape duplicators have found that it is possible to doctor an original videotape or video-cassette transfer, so that the tape is suitable for playback but unsuitable for copying. Essentially, the sync pulses, which are a necessary companion to the picture information, are recorded at rather low or distorted level. In this way they are made sufficient for replay direct through a television set or monitor but insufficient for replay when degraded further by one extra stage of copying. In other words, the legitimate first generation tape will produce perfect pictures when replayed, but when the tape is copied and the second generation copy replayed, the pictures produced are unwatchable.

Of course, because audio tape recordings are not dependent on anything like sync pulses, and merely show an increase of audible noise with each copy generation, the video system cannot be adapted to prevent audio copying. In fact, even the video anti-copy system is far from foolproof, because the development of digital time-base correction circuitry, to stabilise unsteady pictures from poor tapes or degraded line sources, can be used to clean up the deliberately doctored sync pulses on an 'uncopyable' videotape. Here in fact we have a perfect example of how even the most ingenious anti-copying system will almost certainly very soon be counteracted by the ingenuity of another area of the industry.

In the audio field many members of the British Phonographic Industry wear two hats—one as record manufacturers, the other as hardware and blank tape manufacturer. Thus EMI is on the one hand worried about the loss of revenue accruing from both domestic and professional piracy; but at the same time is churning out blank tape cassettes by the million and therefore aiding and abetting the pirates. Philips, while presumably worrying over revenue losses suffered by the Phonogram record companies, recently announced the introduction of a 'post-fade' facility on some tape recorders. The post-fade facility *could* be primarily intended to help domestic, and even semi-professional, pirates eradicate inter-music chat by disc jockeys from recordings made illegally off air.

Sometimes the apparently contradictory attitudes of large companies on points like these is due to the left hand not knowing what the right hand is doing. Other times it is calculated doublethink. Consider, for instance, the attitude of the Rank Organisation to the related subject of

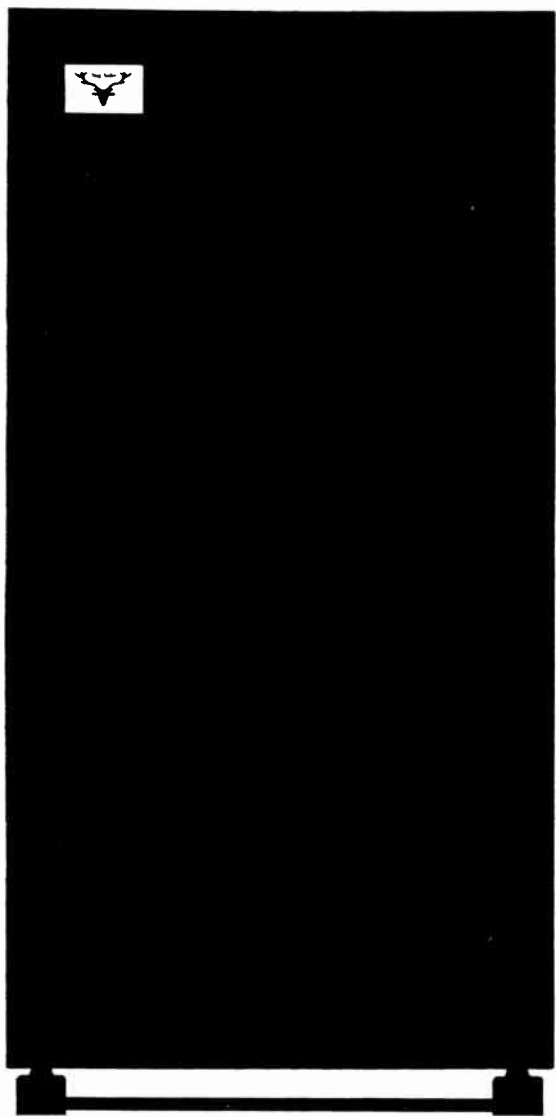
illegitimate document copying. Soon after the issue of the Pentagon Papers, the world became suddenly aware that the days of the national or industrial spy with a miniature camera are over. The spy now borrows a document from the file for a few minutes and runs off a copy using the office Xerox machine on untraceable plain paper. Newspaper reports referred to promising developments in the Xerox research laboratories, where the workers were allegedly evaluating a transparent dye that would make secret documents uncopyable on Xerox machines. At around the same time, patents issued in the Xerox name claimed just such an anti-copy process. But in fact, while one part of the Xerox research team was supposedly burning the midnight oil on developing a coloured, fluorescent dye that when smeared over a secret document would leave it visible to the eye but dazzle a Xerox machine and so make the dyed passage uncopyable, the same firm was also developing machines that were better able to see through a fluorescent dye. It's a fact that whereas the original 813 and 3600 Xerox machines could be dazzled by, and thus fail to copy, any secret message painted with fire orange or neon red Dayglow paints, the later 4000 series could see straight through such an anti-copy dye. By the same token, it is likely that if anyone does devise a system that will prevent the copying of a disc or tape onto existing tape recording machines, the tape recorder manufacturers will very soon have devised a defeat button to make copying possible again. And if one tape recorder had a 'copy enable' switch position then it would only be a short space of time before every single machine on the market had a similar position.

By now it should be evident why the whole concept of an anticopy system is a chimaera—at least for the immediate future. The concept of an indelible *watermark* on the recorded sound is, however, slightly less fanciful.

As with anti-copying, there have been numerous re-inventions of similar systems, all futile. The customary aim is to record an identification signal along with the recorded sound, the identification signal being inaudible to the listener when the disc or tape is played on conventional equipment, but audible or identifiable when played on special decoding equipment.

The ultra- and infra-sonic 'watermarks' have the same limitations as those intended to interfere with bias frequency, as they can be easily filtered out. It is for this reason that where it is essential to prove the origin of copied material a sledge hammer approach may be adopted. When Capital Radio recently broadcast some previously unpublished Beatles tapes owned by Alan Williams, 'the man who gave the Beatles away', the Capital station identification check, '194', was broadcast loud and clear over the Beatles recordings every few seconds. Thus, if ever a bootleg recording is issued, its origin (the Capital broadcast) will be audibly stamped all over it—in fact with the station ID so intrusive there would be little incentive to issue the recording as bootleg anyway.

Stag Audio



There is more to
this than you
[might think]



STAG AUDIO loudspeakers are available only from selected HI-FI retail outlets. Please write to us or fill in and send the coupon below and we will send you a brochure covering the STAG AUDIO range of loudspeakers.



Name :
Address :
..... Tel.No.

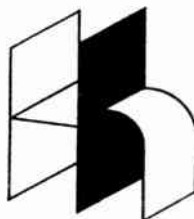
DTR ELECTRONICS LTD., TORRINGTON ST., BIDEFORD, N. DEVON. EX39 4DR. Tel. 4991

GLOSSOP ROAD GOSSIP 2

CELEF—The specialist British loudspeaker company who's slogan at Hi-Fi '77 was 'where we lead others follow eventually' we believe to be very true, look at their record. The Celef Monitor which was introduced in 1974 (a design now some 3 years old) came out as the best buy in a review of all bookshelf Monitor Loudspeakers in Europe, some achievement. This was very quickly followed by the Mini Professional, again very highly acclaimed by Angus McKenzie in 'Hi-Fi Choice'.

Celef then introduced their Domestic Series of loudspeakers the Celef Domestic 1, which is rated at handling over 100 watts, will work with amps as low as 10 watts, and a sound which is very natural and clear, with little colouration, all for £120 pair, and was quickly followed by the Domestic 2, smaller in size, slightly more efficient, but still with excellent power handling.

Finally we have the Mini Professional S.M., the review will tell you all. Problems with Celef, yes, simply we can't get enough to sell, we're sold on them and you will be when you hear them—bring your own record along, and give your ears a treat.



AUDIO CENTRE SHEFFIELD

284 Glossop Road

Sheffield S10 2HS

Telephone: 0742-737893

Export and Professional Dept. 730064

SPEAKER SELECTION

have a full range of speakers from famous names such as

ROGERS (including the new Compact Monitor)

CELESTION DITTON 22

CELEF (including the Mini Pro SM)

with demonstration facilities available for your use.

SPEAKER SELECTION

611 FOREST ROAD, WALTHAMSTOW,
LONDON E.17.

Telephone: 01-531 3117

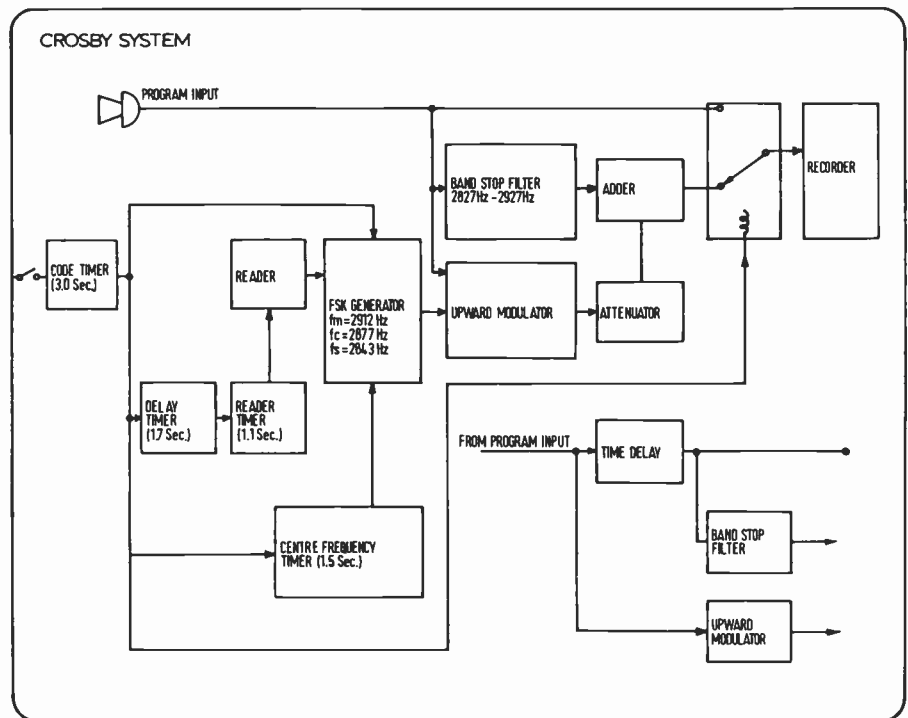
Over recent years there has been much talk in the popular press about EMI's work on a system which will identify the source of a recording, so that it may be proved to be an illegitimate copy. But there has also been considerable confusion over just what it is that EMI have succeeded in doing to curb piracy. Ironically, much of the confusion results from an apparent lack of communication within EMI, with information still being jealously regarded as secret by some sectors of the company long after it has been triumphantly press-released by others. To understand the working of the EMI watermarks, what they can do and what they can't, it is best to look back at where the system originated.

EMI first developed a watermark system to enable the positive identification of identity on similar cards. The card base is made from a material which has magnetic properties and a characteristic magnetic pattern of digits is applied to this material at the time of coating. This pattern or magnetic watermark produces noise modulations which can be recognised by specially designed decoding machines. In superficial respects this resembles the cash card system (as adopted for instance by the National Westminster Bank), whereby a digital pattern of holes is cut through the user's card, the pattern being read by the machine and compared with the number punched in by the user on the machine keyboard when he tries to draw cash. The advantage of the EMI system, of course, is that the magnetic digital code is invisible and thus far more difficult to evaluate, replicate and forge. A logical next step was to apply the code to magnetic recording tape, and this is what EMI are now doing. The actual physical tape in EMI musicassettes is watermarked with the magnetic code, and this code can be recognised when the cassette is played on a machine equipped with a decoder comparable with that used to identify the code on an EMI-style identity card. Because the decoder is detecting the presence of a watermark on the original tape only (once the tape is copied the watermark is left behind on the original tape material), none of the considerations over losing the code on copying apply. It is thus relatively easy for EMI to put down onto the tape a code which is inaudible when the tape is played for entertainment but recognisable by a decoder.

Understandably, EMI do not wish to discuss the exact nature of the imprinted digital code. The fact remains, however, that the EMI system is usable only to prove, in *negative* fashion, that a recording does not originate from EMI. Imagine, for instance, the circumstance of a Beatles musicassette on sale in your local shop. It may look like an EMI issue, but in fact be a pirate copy version got up to look like an EMI issue. The EMI watermark code could help prove that the musicassette was indeed a pirate, by producing no telltale signals when decoded, and this would be good grounds to believe that it did not originate from EMI. But courts do not like negative proof—where the absence of something is regarded as positively proving something else. One can, for example,

imagine Counsel for the Defence arguing tooth and nail that until all EMI tape plants around the world are using watermarked tape, and until it can be guaranteed that there is no old stock of unwatermarked cassettes on shop shelves, it is unreasonable to say that just because a cassette does not have a watermark it is not from EMI. To make things even more difficult for the prosecution, once EMI watermark tape is so widely available as to be in use at all EMI plants around the world, it is hard to imagine some of it, at least, not finding its way into pirate hands—as explosives from legitimate sources become available to terrorists. Perhaps the main benefits accruing from the watermark system will be the deterrent effect on the pirates, and the shopkeepers buying from them (who will never be sure exactly how safe they are to sell that batch of EMI-style cassettes that was offered them so cheap from the back of a lorry).

tight notch filter acting only over a very narrow bandwidth (around 100 Hz) bites a chunk out of the audio spectrum. At the same time a binary code watermark signal is modulated onto an audio frequency sub-carrier, the resultant signal being of exactly the right bandwidth and centre frequency to fit neatly into the window left by the biting effect of the notch filter. The amplitude of this sub-carrier signal is varied, so that it tracks the audio level of the surrounding programme but is always at a level well below the average programme level. One suggestion is that when the programme audio level is nil the subcarrier coded signal will be 55dB down from that audio level which provides 100 per cent radio carrier modulation; and when the programme audio is at a level that will modulate the radio carrier 100 per cent the audio sub-carrier is 40dB down from that level. In this way the coded identification signal is



There is however another approach which record companies including EMI and several in the USA are currently seriously considering. To the best of my knowledge details of the system, the so-called Audicom system invented by Murray Crosby, have not previously been published, but they are in fact (like so many other supposedly secret systems!) available to the public in a published patent.

The Crosby Audicom system was originally intended as a means of automatically collating the number of times a commercial is transmitted on radio or television, for accounting and statistical purposes. Crosby proposed that at the beginning and end of each commercial to be identified, a narrow frequency bandwidth 'window' should be briefly cut out of the audio spectrum and used to accommodate a sub-carrier modulated with an identifiable code. At a frequency of around 2 or 3 kHz, a

always submerged by the programme, but is still recognisable by a decoder tuned to the narrow band window frequency and designed to interpret the digital information modulated on the sub-carrier.

Immediately one envisages the possibility of using the system on discs and tapes. But at the same time several potential difficulties spring to mind. If for instance the coded sub-carrier is at such a low level, will it not be lost in noise after transmission or the copying process? This is one of the areas into which EMI, the RIAA and others are currently looking. But even when results are obtained, it is unlikely that they will ever be published, because if the system is adopted it will not be provident for the record companies to indicate the level at which noise destroys the code. The other inevitable question is how audible to the human ear is a frequency window of 100 Hz bitten out of an audio spectrum. On this

NEW!

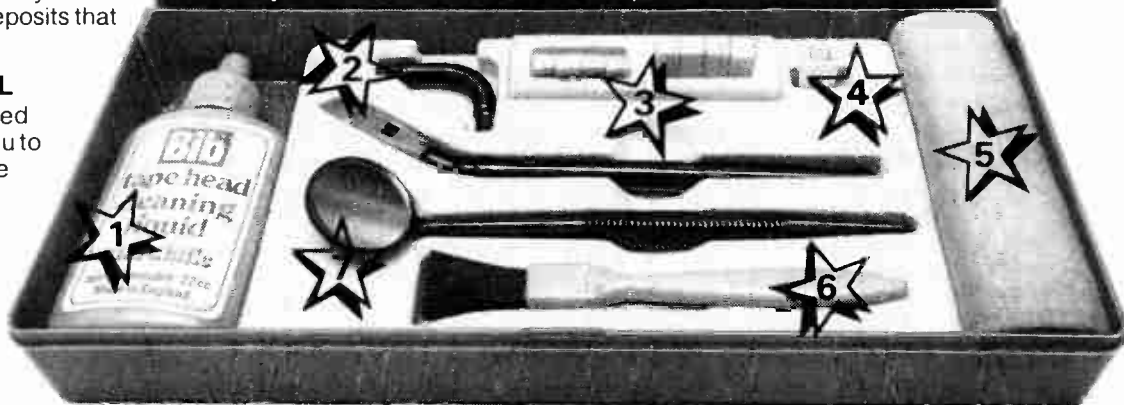
Bib tape head maintenance kit

Ref 99
£1.98
Inc. V.A.T.
Pat. pend.

featuring unique multi-angle cleaning tool

The only universal kit with everything you need for cleaning heads, capstans and pinchwheels of all types of recorders.

Available from leading Audio shops or direct (add 25p P & P) from:
BIB HI-FI ACCESSORIES LIMITED,
Kelsey House, Wood Lane End, Hemel Hempstead, Hertfordshire HP2 4RQ.



1 CLEANING LIQUID

This anti-static fluid safely removes the oxide deposits that reduce sound quality.

2 CLEANING TOOL

Interchangeable angled extensions enable you to reach and clean those vital parts.

3 FELT PADS

Both square-ended and angle-tipped are provided to cover all applications.

4 PAD HOLDERS

In two different colours – one for applying cleaning liquid, the other for polishing.

5 ABSORBENT CLOTH

For removing dirt and oxide deposits from felt cleaning pads after use.

6 CLEANING BRUSH

Soft bristles for gently loosening dust and dirt on delicate components.

7 INSPECTION MIRROR

Permits visual checking of the more inaccessible parts of your machine.

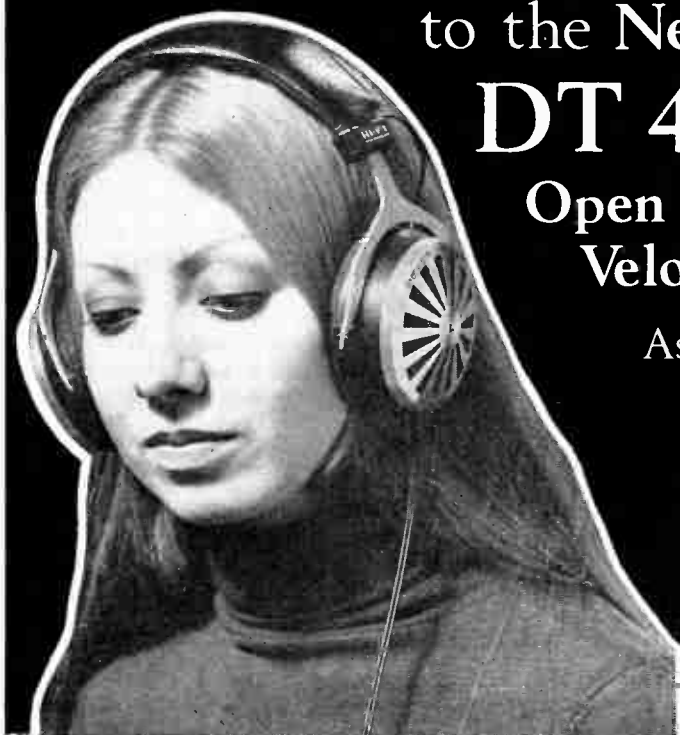
STOP, Look and Listen

to the New **BEYER DYNAMIC**

DT 440

Open Air High Velocity Headphone

Ask your dealer for a demonstration or send now for details.



Beyer Dynamic (GB) Ltd.
1, Clair Road Haywards Heath Sussex PH 16 3DP

Name

Address

.....

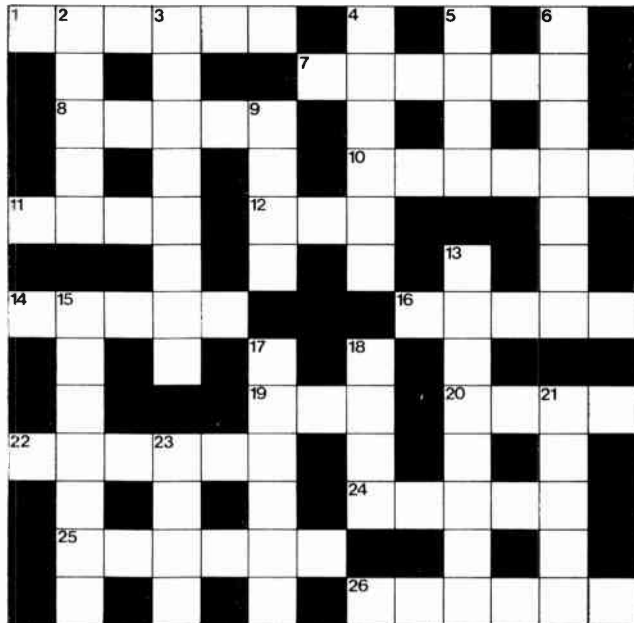
.....

.....

.....

Crossword

devised by Maurice Taggart



CLUES ACROSS

- 1 Waveform cycle arising from sort of pride about nothing. (6)
- 7 Italian composer makes a come-back in musical outfit I'd rather not hear. (6)
- 8 (and 10) Ice-cream substitution involving electronic component? (5-6)
- 11 Composer of innumerable folk songs. (4)
- 12 Encountered at the opera house? (3)
- 14 Symphonic piece by 21, enshrined in redundant electrical recordings. (5)
- 16 Musical sound from church ordination ceremony. (5)
- 19 (and 13 down) Poor man's flautist? Not an orchestral musician! (3-8)
- 20 Singular performance returning in piccolo suite. (4)
- 22 (See 3 down.)
- 24 Ancient Greek reed instrument, for which demented scul borrows a note. (5)
- 25 Remnants of the oscilloscope display. (6)
- 26 Otherwise adroit Haydn conductor. (6)

CLUES DOWN

- 2 (and 6) Late Swiss pianist-conductor, possibly fed rich wines. (5-7)
- 3 (and 22 across) Endless problem of loudspeaker housing? (8-6)
- 4 Lively performance announced by poster somehow. (6)
- 5 Heroine of 'La Boheme'. (4)
- 6 (See 2.)
- 9 Respighi celebrated its pines and fountains. (4)
- 13 (See 19 across.)
- 15 Slow section from pedestrian 'Dante' performance. (7)
- 17 Spatial recording which is just rot, see? (6)
- 18 Hungarian pianist featured in 'Polovtsian Dances'. (4)
- 21 Flamboyant Hungarian composer. (5)
- 23 Side-drum figure prominent in music of Lambert. (4)

A £3 record token will be awarded to each of the first five correct solutions picked from those which arrive by July 5th.

I can offer some practical help.

A year or so ago, before I learned of the Audicom system, there occurred to me one method of indelibly water-marking a recording (rather than—as with the EMI system—the physical tape on which it is made). This was to abandon the principle of *inaudibly* marking and adopt instead the principle of marking audibly but *imperceptibly*—that is to make a mark which would be recognisable to anyone looking for it but unlikely to be noticed by anyone else. Such a mark could then be introduced in the mid-frequency range, where no copying process with deliberate filtering could eradicate it. In this respect I was, without realising it, following along the lines already pursued by Murray Crosby. But whereas Murray Crosby intended notching a tight window out of the audio spectrum and filling it with a recognisable code, I was intending only to notch and then recognise the presence of the empty window by spectral analysis. That is to say, I planned to introduce an intermittent window into the recording, and on play-back use a spectral analyser to reveal the coming and going of that window. Both Technics at Slough and Dolby Labs at Clapham very helpfully co-operated with tests, but lack of sufficient narrow-band analysis equipment prevented any positive final findings.

However, some surprising results on the audible effects of narrow notch windowing emerged. For instance, by the use of the Technics graphic equaliser (which can provide up to 12dB attenuation with a high Q) it was found that a dip in the mid band

frequency range, for instance between 2 kHz and 4 kHz, could often be introduced intermittently with surprisingly little audible effect. Although a notch of lower or higher frequency may be relatively inaudible while *consistently* maintained, any attempt at *intermittent* notching outside the 2-4 kHz range produces highly offensive sounds. This was due variously to intrusion onto the fundamental frequencies of musical notes (below 2 kHz), modulation of high frequency background noise, and intrusion into the upper harmonics of musical tones (above 4 kHz). It was also found that careful selection of the location in the recording where intermittent notching was to be introduced was necessary if the presence of the notch was to be unobtrusive. It thus seems likely that a window 'filled' with a coded sub-carrier in Audicom fashion could, under the right circumstances, be effectively inaudible to anyone unaware of the window's presence.

My tests also showed that it should be possible to create the 'right circumstances' for introduction of the window, by trial and error, and eventually experience in selecting a musical passage which has a frequency content and amplitude characteristic that is best suited to mask the frequency window to be introduced. Alternatively, the frequency window will need tailoring to suit the program material.

Certainly, any attempt at indiscriminate notching, without careful consideration of the particular program material being treated and the audible effect which the window has on that material, will be

doomed to disaster and abhorred by hi-fi ears.

There is, of course, no reason why the characteristics of the window introduced into any commercial recording should not depend solely (in location, frequency, bandwidth and duration) on the nature of that individual recording. Provided the record company knows and has accurately logged the position of the coding windows introduced into all its recordings, that company will have no difficulty in the future in detecting those windows, because it will know how and where to look for them. This in itself will prove a deterrent to the pirate. When illegitimately copying a recording, he will be faced with the knowledge that somewhere in that recording (although he's not sure where) is a notched out window (of unknown frequency) including an identification signal coded (in some unknown fashion) which is positively identifiable by the owner of the copyright. And of course a notch is virtually impossible to repair even if you know where it is. Such a situation would enable the copyright owner to point, electronically as it were, to a telltale watermark in the sound on an illegitimate recording, and thereby identify its original source. This would provide the *positive* proof of piracy that the record companies require, in addition to the *negative* proof of authenticity that the EMI tape watermark can offer. That, in addition to the proposed levy on hardware sales, is likely to be the best safeguard that the sound recording industry can reasonably expect in the foreseeable future. ●



The TAPE SPECIALISTS HOME & EXPORT



Use this discount coupon/ad. to buy at these "Ultra-special" prices. (Errors price changes excepted)

WHICH CASSETTE? FUJI FILM WHICH MACHINE?

The manufacturers/distributors of the following equipment recommend you use FUJI cassettes with their decks:
AIWA * AKAI * AMSTRAD * AUDIOTRONIC * BELTEX * HANIMEX * JVC * NAD * ROTEL * SANSUI * TEAC * TOSHIBA * TRIO

Buy by post or come to one of our shops!

FL30.....£0.48	FL90.....£0.96	FX46.....£0.77	FX80.....£1.19	FX 8-Track
FL60.....£0.70	FL120.....£1.27	FX60.....£0.96	FX90.....£1.35	90min.....£1.54

Agfa LN C60 .. 52p C90 .. 68p C120 .. 92p	Audio Gold C60 .. 35p C90 .. 49p C120 .. 64p	EMI Hi Dyn C60 .. 57p C90 .. 68p C120 .. 92p	Maxell UD C46 .. £1.01 C60 .. £1.14 C90 .. £1.29 C120 .. £1.76	Memorex CrO2 .. 88p C45 .. 88p C60 .. 92p C90 .. £1.30	Scotch Classic C45 .. £1.10 C90 .. £1.81	Sony FeCr C60 .. £1.23 C90 .. £1.71	REEL-TO-REEL Agfa LN 5" 900' LP .. £1.75 5 1/2" 1200' LP .. £2.01 7" 1800' LP .. £2.90 10 1/2" 4200' Cine £7.55 10 1/2" 4200' NAB £8.69 5 1/2" 1200' DP .. £2.08 5 1/2" 1800' DP .. £2.90 7" 2400' DP .. £3.59 5" 1800' TP .. £3.36 6" 2400' TP .. £4.50 7" 3600' TP .. £4.51	10 1/2" 3600' NAB £9.51 5" 1200' DP .. £3.33 7" 2100' DP .. £5.60 10 1/2" 4200' Cine £10.10 10 1/2" 4200' NAB £12.12	Sony SLH 7" 1800' LP .. £3.08 10 1/2" 3600' NAB £7.98 7" 2400' DP .. £4.88
Agfa Super C60 .. 56p C90 .. 76p C120 .. £1.14	BASF LH C60 .. 59p C90 .. 79p C120 .. £1.09	Fuji Super FL30 .. 48p FL60 .. 70p FL90 .. 96p FL120 £1.27	Maxell UD/XLI C60 .. £1.36 C90 .. £1.74	Memorex 8-Track 45 min £1.26 60 min £1.36 90 min £1.45	Scotch Video VC60 £17.75	Sony LN C60 .. 51p C90 .. 71p C120 .. 98p	TDK Dyn. C45 .. 50p C60 .. 54p C90 .. 74p C120 .. 99p C180 .. £2.38	Fuji 7" 1800' FM .. £3.25 7" 1800' FG .. £3.70 7" 1800' FB .. £5.18	TDK Audua 7" 1800' LP .. £2.69 10 1/2" 3600' NAB £7.59 7" 1800' matt £3.15 10 1/2" 3600' matt £9.73
Agfa SFD (SM) C66 .. 72p C96 .. 96p C120 .. £1.26	BASF Sup. C60 .. 80p C90 .. £1.18 C120 .. £1.55	Fuji FX FX46 .. 77p FX60 .. 96p FX80 .. £1.19 FX90 .. £1.35	Maxell UD/XLII C60 .. £1.49 C90 .. £1.89	Scotch Dyn C60 .. 63p C90 .. 82p C120 .. £1.14	Sony HF C60 .. 78p C90 .. 83p C120 .. £1.12	TDK SD C45 .. 61p C60 .. 69p C90 .. 90p C120 .. £1.31	Agfa PEM (MATT) 5" 900' LP .. £2.72 7" 1800' LP .. £4.27 10 1/2" 3600' Cine £8.78	Maxell (Matt) 7" 1800' LP .. £3.89 10 1/2" 3600' NAB £9.21	Scotch Hi-Fi 7" 1800' LP .. £3.93 7" 2400' DP .. £4.94
Agfa CrO2 (SM) C60 .. £1.04 C90 .. £1.30 C120 .. £1.78	CrO2 C60 .. £1.18 C90 .. £1.47 C120 .. £1.92	Fuji FX 8-Track 90 min. £1.54	Memorex MrX2 C30 .. 61p C45 .. 65p C60 .. 66p C90 .. 89p C120 .. £1.26	Scotch H/E C45 .. 77p C60 .. 82p C90 .. £1.06	Sony CR C60 .. £1.09 C90 .. £1.44	TDK SA (Avilyn) C60 .. 99p C90 .. £1.36	Agfa PEM (MATT) 5" 900' LP .. £2.72 7" 1800' LP .. £4.27 10 1/2" 3600' Cine £8.78	Memorex 7" 1200' 5P .. £2.75 7" 1800' LP .. £3.20 7" 2400' DP .. £4.32	Scotch 207 Prof. (for Revox A77 Series) 10 1/2" 3600' NAB £10.85

All mail to: ESTUARY AUDIO, Dept. HF, 1a Highbury Stn., Highbury Corner, London N5. (Callers welcome)

LEICESTER SQUARE STN., WC2. Bkg Hall 10.00 am - 6.30 pm. (01-439 9210)	HIGHBURY STN., N5. 10.00 am - 5.30 pm. (01-607 0644)	244 EDGWARE RD., W2. 3rd Floor. 9.30 am - 5.30 pm. (01-724 1673)	MANCHESTER 3: VICTORIA STATION APPROACH. (832 4592)	113 RECTORY GROVE, LEIGH ON SEA. 9.00 am 5.30 pm. (0702 712861)
---	---	---	--	--

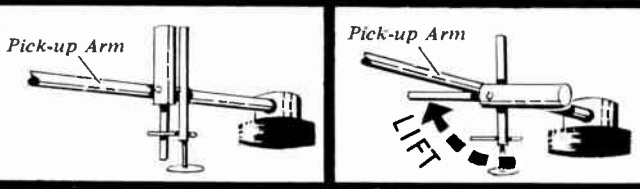
CLEARANCE SALE

RECEIVERS & TUNERS	Toshiba SY404 CD4 Demodulator .. £55.00
JVC JRS 600 .. £375.00	
Aiwa AX7500 .. £155.00	
Marantz 2230 .. £150.00	
Marantz 2220 .. £130.00	
Pioneer SX750 .. £230.00	
Pioneer TX9500 .. £150.00	
RECORD DECKS	
AR Turntable .. £60.00	
Pickering Gyropoise .. £64.00	
JVC Direct Drive JL-844 .. £150.00	
Toshiba SR 200 .. £59.00	
QUADRAPHONIC EQUIPMENT	
Toshiba SB514 Quad Amplifier .. £250.00	
SPEAKERS	
Studiocraft 440 .. £169.00	
Bose 301 .. £118.00	
JVC VS 5323 .. £110.00	

ALL THE ABOVE ITEMS ARE NEW, BOXED AND CARRY FULL MANUFACTURER'S GUARANTEE

HOLDEN (PHOTOGRAPHICS) LIMITED
49 FISHERGATE, PRESTON.

Give your stylus a LIFT!



Do you have to hurry to your record deck at the end of each side of a disc to stop the stylus grinding on in the end groove?

Then you need a "Stylift"

Suitable for almost all manual record decks without automatic arm return. Easily fitted (no drilling required) the "Stylift" is a precision made accessory that sits alongside the platter of your turntable and simply lifts the arm from the disc as it moves onto the end groove.

A unique patented product from Monitor Audio. PRICE: £5.57

Available from any of the KJ branches listed below or by mail - POST FREE (UK only) - from KJ Leisuresound Dept. SFN, Bridle Path, Watford, Herts, WD2 4BZ. Telephone orders can be accepted where payment is made by Access or Barclaycard - simply telephone our order desk on Watford 45248.

For customers outside the UK the Tax free price is £4.95 plus 60p for post, packing and insurance.



AN AUDIBLE DIFFERENCE
48 Wigmore Street, London W1 278 High Street, Uxbridge, Middx.
101 St. Albans Road, Watford 27 Springfield Road, Harrow, Middx.

Subjective Sounds

Paul Messenger

FIRST, an *apologia*: I have every intention of getting down to listening to the sort of hi-fi that most people can afford, rather than the sort of stuff for which nutcases like myself take out a second mortgage. However, the exotic are more interesting to me than the mundane, and I seem to have got hold of more than my fair share of 'super-fi' of late. It is also necessary to establish criteria of quality or 'degrees of goodness' in order to make any meaningful value judgments. Nevertheless, I am currently assembling a more modest system which will make a more appropriate yardstick than Linns, Naims, stacked Quads, etc.

Secondly, I feel it is necessary to expose myself by revealing some sort of autobiographical detail. Hi-fi is very much a matter of satisfying personal prejudices and inclinations, and subjective evaluation demands some assessment of these for meaningful communication. Despite innate shyness and a desire for anonymity, I don't feel that hiding behind a corporate authoritative 'we' is really appropriate to this column.

In my late twenties, I listen to both rock and classical music in a ratio about 2:1. My taste in rock is mainly American; particular favourites include Ry Cooder, Little Feat, The Grateful Dead, Bob Dylan, Emmylou Harris and Bonny Raitt, and I am fond of acoustic instruments in a rock or country/rock context. On the classical side, I tend to listen to Handel and his predecessors, and prefer chamber to orchestral works. I particularly like the 'cello as an instrument, and enjoy choral music from Gregorian chant onward.

As far as equipment is concerned, I have a rather purist approach, being less concerned with appearance, finish and facilities than sound quality. The amount of detail transmitted is of greatest importance to me; this particularly relates to the accuracy of transients, *ie* the start and finish of a note. High frequency distortion—especially of an electronic nature—is offensive, and also mid-range coloration, but to a lesser extent. Bass distortion I find easier to live with. I am probably too easily impressed by the unusual and unorthodox, like simplicity, and have a few anglophiliac tendencies.

I shall continue to concentrate solely on disc reproduction; the disc is the prime medium for me by an enormous margin (master tapes are very nice but not easily come by, I don't find the radio particularly convenient or to my taste, and musicassettes just don't make it). I suspect that many of the differences one finds between amplifiers are related to the phono (disc) input of the pre-amp; as this is the input I use all the time it is of paramount importance to me and differences will relate to this.

MY RECENT piece on a Japanese super-system (January, p. 63) aroused a certain amount of interest, particularly the descriptions of the elaborate connecting wires used. Trio have lately announced a super-amp which has been designed with connecting wires in mind (May, p. 61) and it was interesting to have an opportunity to speak to the designer, Mr Ohara, and do some listening.

The demonstration was marred by the indifferent record playing system used, which attempted to murder one or two records I knew well. But it nevertheless did show that a change of speaker cable could make a noticeable change in the sound in this system, even though both the leads used would have been acceptable in conventional engineering terms. The difference was fairly subtle and involved the tightness of the transient information.

It seems probable that these differences may be due to degrees of amplifier instability, but Mr Ohara showed measurements of loud-speaker wire distortion and, when questioned, said that these had remained the same when using different amplifier types. Unfortunately I have been unable to get hold of any of the 'super-cables' to do experiments myself, although I have found that it is undesirable to have any form of switching device between amp and speakers (which is well-known), and heavy cable is worth using for long runs. Maybe I'll see whether the builders can put in channelling for the liquid helium. Case as yet unproven.

PICKUP ARMS are a source of great fascination to me, and undoubtedly have an appreciable effect on the sound of system. One of the most interesting reports on arms I have ever seen was written by Poul Ladegaard, a Dane whom I met in Paris who used to work as Technical Editor on the excellent Danish magazine *High Fidelity* and is now with B & K. We hope to reprint the article at some stage when certain obligations are discharged, but in the meantime I shall break my usual rule on measurements to extract some of the salient features.

I admit that my Danish is on a par with my Swahili and Urdu, but it is nevertheless possible to extract information from the measurements, concerning the fundamental resonance and arm resonances at higher frequencies (up to 1 kHz). While I do not believe these tell more than part of the story of pickup arm behaviour, they are nevertheless interesting in themselves.

Each arm was tested with three different cartridges representing extremes of damping and compliance: ADC XLM (50 c.u.); Jelco

MC14D (18 c.u.) (a cartridge unknown to me); and Ultimo DV38/20A (8.7 c.u.). The Ultimo revealed most problems in the arms, and I suspect that other m-c pickups might have been even worse, as the metal mounting bracket of this cartridge must tend to reinforce headshells. The use of three cartridges enables one to confirm that certain resonances are indeed due to the arms, and there was excellent correlation in this respect. The low frequency resonance gave interesting information on the effect of damping where it was used.

Taking the arms alphabetically, the Grace G707 gave noticeable *lf* resonances of 10 dB at 7 Hz (ADC), 10 dB at 9 Hz (Jelco) and 10 dB at 11 Hz (Ultimo), due to the absence of damping. But for this very reason the levels at 20 Hz were only +1 dB, +3 dB and +2 dB respectively. Small arm resonances were visible at 100 Hz, 300 Hz and 500 Hz.

The Keith Monks M9BA III showed *lf* resonances of 10 dB/8 Hz (ADC), 10 dB/9 Hz (Jelco), and 6 dB/11 Hz (Ultimo); at 20 Hz the levels were +3 dB, +4 dB and +3 dB respectively. There were no visible arm resonances in the audio band up to 1 kHz.

The Mayware Formula 4 shows the effect of fairly heavy damping at low frequencies: +7 dB/7–11 Hz (ADC), +6 dB/9–12 Hz (Jelco), and +5 dB/11–20 Hz (Ultimo). At 20 Hz the levels are +4 dB, +3 dB, +5 dB respectively. There is a noticeable arm resonance at 60–70 Hz and very small perturbations at 250 Hz and 400 Hz. The Mayware arm has recently been modified with a thicker headshell, which may give different results.

The SAEC W308 New (a double-knife-edge design) is undamped and has quite high inertia: +12 dB/6 Hz (ADC), +7 dB/7 Hz (Jelco), and +9 dB/9 Hz (Onlife); +3 dB, +1 dB, +3 dB respectively at 20 Hz. Very small perturbations are visible at 150 Hz, 200 Hz and 400 Hz and at odd points below 50 Hz.

The SME Series II Imp. (fixed headshell) gives +10 dB/7 Hz (ADC), +12 dB/9 Hz (Jelco), and +11 dB/11 Hz (Ultimo); +2 dB, +4 dB, +3 dB respectively at 20 Hz. There is considerable unevenness between 20 Hz and 30 Hz and a small resonance at 200 Hz.

The Transcriptor 9 in. Fluid Arm gives +8 dB/7–9 Hz (ADC), +8 dB/8 Hz (Jelco), and +8 dB/11–13 Hz (Ultimo); +3 dB, +2 dB, +4 dB at 20 Hz respectively. Small arm resonances can be seen at 50 Hz, 150 Hz, 200 Hz and 400 Hz.

The Transcriptor Vestigal arm gives +10 dB/7 Hz (ADC), +9 dB/9 Hz (Jelco), and +11 dB/11 Hz (Ultimo); +2 dB, +2 dB, +3 dB at 20 Hz respectively. Very serious resonances can be seen at 25 Hz, 120 Hz and 180 Hz, with smaller ones at 90 Hz and 380 Hz.

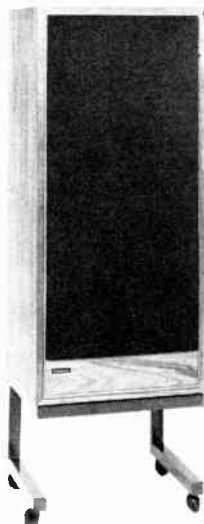


KJ hold the key...

Unlocking the door on a new sound experience KJ are proud to announce that they are now exclusive London agents for the excellent range of Keesonic loudspeakers. From the minute KUB (selling for around £62 a pair) to the mighty KBM at over £400 a pair Keesonic speakers are built with great care and attention to detail. Why not call in at your most convenient branch and give them a listen—you never know they may hold the 'Kee' to your future listening pleasure.

Keesonic

The KBM is Keesonic's 'state-of-the-art' speaker and has an excellent pedigree being a basic broadcasting company monitor speaker without in-built power amplifiers. The outstanding characteristic being its superb transient response.



The KRF will handle large signals without distress. The most noticeable characteristic that stands out is the firm and extended low frequency performance, unusually good for the cabinet size.



LONDON W.1. - 48, Wigmore Street Tel: 01-486 8263
WATFORD - 101, St. Albans Road Tel: Watford 45250
HÁRROW - 27, Springfield Road Tel: 01-863 8690
UXBRIDGE - 278, High Street Tel: Uxbridge.33474

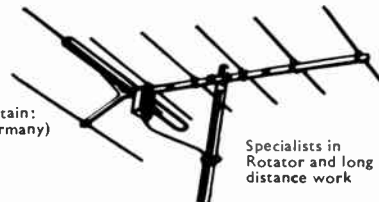
Opening Hours Monday - Saturday 9.30 am - 5.30 pm
 Thursday late night until 8pm

IF PREFERRED, QUALITY FM & TV INSTALLATIONS IN LONDON, SURREY, NORTH KENT, NORTH SUSSEX—2 YEARS WRITTEN GUARANTEE

ASTRA'S SILVER JUBILEE SUMMER'S SPECIAL OFFER
20% OFF AERIALS & PARTS: 10% OFF ROTATORS
 Purchases over £20 carriage free. Send or bring this advert.

A really personalised mail order service but S.A.E. PLEASE!

Stockists of the finest aerials available in Britain:
 Fuba TV/FM aerials (W. Germany)
 J-Beam TV/FM aerials
 Antiference TV/FM aerials
 Aerialite TV/FM aerials
 UKW Aerials (E. Germany)



Specialists in Rotator and long distance work

ASTRA (D.I.Y.) AERIALS

Backed by 23 years practical aerial rigging experience.
GENUINE D.I.Y. SPECIALISTS IN FM AND TV AERIAL WORK
EXTRA SPECIAL SUMMER OFFER—10% OFF ROTATOR INSTALLATIONS

GOLD STANDARD NEWS!

Just arrived from E. Germany—superb quality, low priced FM aerials. Golden anodised, robust, with built-in balun. The Quality jumps at you. You'll love the aerial and drool at the price.

The Golden 3 element	£7.97
The Golden 5 element with double reflector	£13.20
The Golden 8 element with triple reflector for long distance use.	£19.00

Prices include VAT and 20% discount.

Over 2,500 aerials stocked; all transmitters; poles; lashings; rotators; clamps; wall brackets; amplifiers; baluns; low-loss coax white or brown Super low loss Coax: 300 ohm cable.

Many of our customers come from recommendation.

53 WHITEHORSE ROAD, CROYDON

Near Glosser Pub and Garage
 Open 9.30-5.30; open lunchtime
 24hr answering service
01-684 4300/5262
FM AND TV AERIALS AND ROTATORS ON DISPLAY

APPOLO



STANDS

MADE IN THE U.K.

ALL APPOLO MODELS ARE MANUFACTURED IN HIGH GRADE STEEL AND COATED IN NYLON

AVAILABLE FROM LEADING HI-FI DEALERS



Appolo III



Sabre II



APPOLO WALL BRACKETS
 With swivel action. For speakers up to 50lb weight. Complete screws and Rawlplugs. £9.00 a pair inc. VAT.



Appolo II

For Brochure and Dealer List send stamped addressed envelope to:

GRABERN AUDIO
13 FAMET AVENUE,
PURLEY, SURREY CR2 2DN.
 Telephone: 01-660 4780

FM Radio

Angus McKenzie

THE BBC Matrix-H system is superior to other quad broadcast systems in several ways. Most importantly, it is very economical, and mono and stereo reception are unimpaird. Anyone who is in a position to receive our stereo transmissions, ie 90% of the UK population, can, if they wish, take advantage of quad. And as the stereo coverage is increased, quad will automatically be included. The technical flexibility of the system now exists—it is up to the programme producers to develop it as they wish.'

This quotation was taken from the *Radio Times*, and was a statement made by J. Duncan MacEwan, chief engineer of radio broadcasting. I have already written much about Matrix-H in the last six months, and have said that in my opinion the system itself is an acceptable one, giving at best a good quadrasonic sound with good mono compatibility, and fairly good stereo compatibility. The main problem as I see it is that the stereo compatibility is basically not optimum, and considerable efforts are required from studio managers to achieve a sound which will be very good in stereo whilst also being good in quadrasonic and mono. Judging by the first week's Matrix-H programmes, I fear that MacEwan's statement was rather optimistic; I say this after lengthy discussions with friends who have listened to these first official quad programmes.

Since my priority for the time being is stereo compatibility followed by mono compatibility, and lastly a reasonable quadrasonic quality, I listened to the majority of these programmes first in stereo, subsequently studying them at length from carefully made tapes in quad and mono. My general conclusions are that compatibility was only fair in stereo, and the most marked problem seemed to be fuzziness of centre images, together with an out-of-phase sound produced from signals on extreme left and right.

The first official Matrix-H broadcast was on the morning of Saturday April 30th, and incorporated performances of baroque works for four choirs. The recording was made in St John's, Smith Square, which is well-known to have a superb acoustic that is also fairly reverberant. My colleagues and I found the tape hiss quite unacceptably high, and whilst the basic stereo sound was at first acceptable, though not good, the more I listened to it the more I became disturbed by problems of perspective. Apart from some very rare occasions, I have always used a basic quadrasonic microphone cluster for my own quadrasonic recordings, but I did not note any evidence of the use of such a technique in this broadcast. It appeared to me that various pairs of mikes were placed around the church, and the outputs from these were pan-potted into the different quadrants in an attempt to give a good quadrasonic sound, but one which lacked cohesion and the remarkable atmosphere of St John's.

Occasionally I did notice sounds, when listening in stereo, which seemed to come from outside the front quadrant, and occasionally they seemed to come from inside my head. Choirs on the extreme left and right appeared to come from inside the speakers, but the other two choirs were more fuzzy either side of centre. I have heard very many stereo broadcasts of this type of music which have been appreciably better, and few which disappointed me as much as this one. When reproduced quadrasonically, the sound was better, but I still could not feel any sense of realism. The total sound seemed to be coming from blurred images around the room, with no coincident reverberation.

In the early evening of the same day, Radio 2 relayed a Jack Bruce Band concert, introduced by Pete Drummond. I must admit that this was not my favourite type of music, but nevertheless I listened to it rationally in an attempt to be absolutely fair. I am sorry to have to say, though, that I was disappointed with what seemed to me a poor standard of production. At rehearsals the producer and his engineer will normally sort out problems such as bad hum on guitar amplifiers, and howl-round points for PA systems, but these faults were evidently not given the priority that they should have received, for they were all too evident throughout the programme. Furthermore, although this must be personal taste, my colleagues and I did not appreciate being belted in the back by percussion, with almost all the remaining sound in the front! I would have preferred the guitars to be at the sides towards the back, with much of the percussion in the front, for surely this would have helped stereo and mono compatibility. In mono, cymbals sounded very phasey, high pitched, and lacking in body, whereas in stereo they appeared also to be phasey and rather wishy-washy around the centre. Some of the singing in the front produced *hf* splashing from the back, and I could not attribute this to any fault in my system. The applause sounded strangely coloured and phasey in stereo, but was appreciably better in quad. At best, however, the stereo and quad were good, but at worst the sound resembled that of a poor pre-recorded cassette.

There can be no doubt, though, that this programme showed that the Matrix-H system is potentially a reasonably good one, and it is perhaps in finer details that much more care will have to be taken in future. Signal-to-noise ratios will have to be watched carefully, and balancers especially will have to experiment much more before going on the air with a committed balance. Whilst mono listeners may well be in the majority, they will probably be mainly listening on relatively poor quality equipment, or even transistor portables often tuned in to medium wave, whereas the majority of critical listeners will surely be listening to stereo, and so sounds should be balanced for optimum stereo, provided that the mono balance is acceptable,

even on poorer quality equipment.

I was most interested to hear the Royal Festival Hall Concert on Wednesday May 4th, conducted by Charles Mackerras. The main works were Mozart's *Prague Symphony* and Mahler's 4th. My instant reaction to the stereo was, I am afraid, disappointment, since I found that woodwind instruments in the centre lacked clarity in positioning, whereas half-left and half-right sections of the orchestra seemed to come forward. Front desks of the violins and cellos seemed very much closer than the back ones, almost as if a multi-mike balance had been used, and once again I was bothered by a phasiness when listening to the stereo. For some reason that I cannot explain I found the sound quality rather hard and fake, but this improved considerably for me when listening in quad. Somewhat surprisingly I found that the front of the quad made much more acceptable stereo than the allegedly compatible stereo of the broadcast itself, for the woodwind lost their vagueness in positioning and the odd double sound seemed to disappear.

The Festival Hall is not an ideal hall for generating quad anyway, and I suggest that the BBC must either perfect their technique or keep quad out of this hall for some time to come. The Royal Albert Hall on the other hand should be much more impressive. After making all these comments, I am now informed that the basic quad sound came from two stereo C24s with one mike considerably behind the other, and this probably introduced some of the phasiness and double images heard. Furthermore, since the front mike would be feeding the front of the quad, it might also explain my preference for the latter over the Matrix-H stereo.

Mr Sloane of Golders Green informed me later that he was so disappointed with the broadcast that he decided to bulk-erase his tape even though the performances were excellent. Sentiments similar to Mr Sloane's were expressed by many readers who have communicated with me.

Far more successful was a brilliant production of *School for Scandal*, recorded in binaural sound. Listening on Sennheiser HD 414 headphones, I found the general positioning and action entralling, and obtained some of the best binaural centre-front images that I have yet heard. Once again, the BBC used their own Perspex disc/ECM50S dummy-head. I am pleased to report that the stereo compatibility was quite reasonable, and became excellent if I considerably increased the width between the speakers. In the long run, binaural reproduction might well become even more promising than Matrix-H.

In a future issue I shall be outlining the results of some experiments I made when recording Pierre Boulez and the National Youth Orchestra in the Royal Festival Hall in stereo and binaural sound, and the Bedfordshire County Youth Orchestra in the Royal Albert Hall in stereo, quad and binaural.

The Rogers LS3/5A

– the original, the best and the reference

Trevor Attewell—*Hi-Fi News & Record Review*, June 1975

Any natural tendency to be slightly sceptical of the probable performance of such small loudspeakers disappears promptly when they are put to work. . . . they remain splendid value for money and make some of today's pretentious and expensive loudspeakers look pretty silly!

Gordon King—*Practical Hi-Fi & Audio*, October 1975

. . . It was not always an easy matter to determine whether the large loudspeakers or the Mini's (Rogers LS3/5A's) were delivering the sound! . . . and the Mini loudspeakers (Rogers LS3/5A's) have to be heard to be believed! . . .

Audiogram—*The Audio Advisor*, Washington DC, U.S.A.

. . . and it (Rogers LS3/5A) is so good it has caused us to re-evaluate our favourite speakers of any size and price.

The (Rogers) LS3/5A is tight, clean, smooth, flat and well defined. Within its frequency range, NO speaker we have heard possesses ALL of these qualities to a greater degree,

Perhaps it will help if we say that not only do we stand by every word of our review, but we wish we had raved about the LS3/5A even more. This little box is simply one of the World's greatest loudspeakers, regardless of cost.

"(the only speaker systems that have been able to make the Spendor sound coloured have been the well-tuned Fulton 'J' and the Rogers LS3/5A's)"

"... good as it was, it did not match the smoothness of the LS3/5A's"

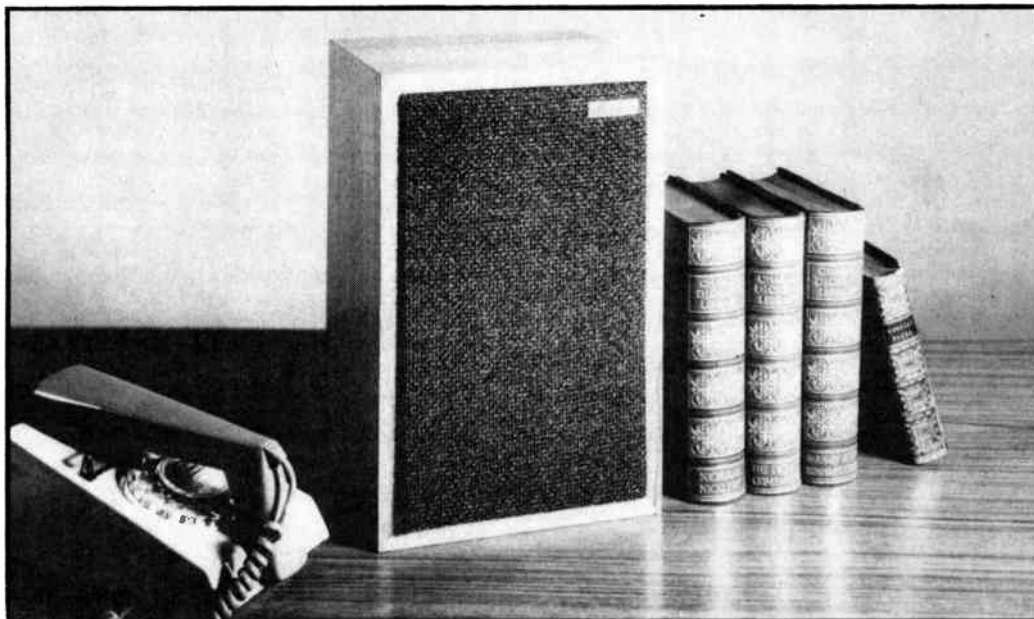
"... it is slightly outpointed on voice by the LS3/5A, but that speaker outpoints all others as well in this region."

Practical Hi Fi & Audio, December 1976

The highest score of all the loudspeakers was that produced by the (Rogers) LS3/5A.

Stereophile—U.S.A., Spring 1977

Adding to the illusion of a large speaker system is the remarkable low-end performance . . . and the bass detail is astonishing from 5 inch woofers . . . these are a perfect way of getting sound that is comparable to that from Quad electrostatics, at a far lower cost and with added bonuses of slightly smoother high-end, better stereo imaging, a broader listening area and considerably greater apparent (that is, audible), size. Above 60 Hz the Rogers/BBC Mini-Monitors out-perform the vast majority of systems costing upwards of \$500 per channel.



There is no true alternative to the Rogers BBC-designed LS3/5A loudspeaker which represents the culmination of several years of BBC research and is regarded worldwide as the finest bookshelf loudspeaker available. Meticulous attention to detail construction utilising specially selected birch laminated cabinet materials, precision beech bracing and precise damping guarantees absence of the cabinet colourations experienced with other designs. Experience in over six years of manufacture of the BBC-designed loudspeakers (including development

of the original BBC LS3/6 loudspeaker, which is still regarded as a standard by numerous users) ensures the guaranteed performance and production consistency for which Rogers loudspeakers are renowned. Careful calibration of every individual loudspeaker against the BBC-approved reference standard ensures identical performance to the BBC specification, thereby avoiding the production variations found in other similar designs. Use of the very highest quality, close-tolerance components ensures the complete long term stability of perform-

ance expected of BBC Monitor standard loudspeakers.

Price : £139.50 per pair

(excluding VAT) Finish: Teak or Walnut.

AVAILABLE ONLY FROM A CAREFULLY CONTROLLED NETWORK OF ROGERS FRANCHISED DEALERS

For descriptive literature and review reprints send a large stamped addressed envelope to:-

Rogers



British High Fidelity

4-14 BARMESTON ROAD, CATFORD,
LONDON SE6 3BN
Telephone: 01-697 8511/2
Cables: Swissec London S.E.6.

AMPLIFIERS

Measuring what we can hear

Some new ideas and techniques for correlating objective measurements and subjective impressions by Gordon J. King

AUDIO engineers the world over are continually searching for objective evidence and testing methods to show reliably by measurement those differences between amplifiers which, it is alleged, are audible in some listening tests. That is, why some solid-state amplifiers are voted more musical than others and why some of the early valve amplifiers are now being claimed to be subjectively more palatable than some of the best of today's amplifiers using transistors and op-amps.

Specific areas of objective/subjective correlation have been examined, and I have contributed to this,¹⁻⁵ but in general the statistical consistencies of the measurements and their often small differences fail to show conclusively why it is that one amplifier is less 'musical' than another. Indeed, a valve amplifier may be voted as highly musical, when its various conventionally measured distortions are not uncommonly a magnitude or two (or more!) greater than those produced by a modern solid-state amplifier of impeccable engineering specifications which proves less acceptable to the critical ear.

A recent AB panel listening test between an early valve amplifier of respected make—a pair of hot KT66s in the power amplifier of each channel—and a recent solid-state amplifier which measured extremely well (in terms of *engineering* specification), came out in favour of the valve model, in spite of the fact that this was shown to produce some 2% distortion while the distortion of the solid-state brew was a mere 0.02%.

Clearly then, it is certainly not the amplitude of the distortion which counts—more likely the nature and hence the order of the harmonic components and intermodulation products. In other words, the precise nature of the input/output transfer characteristic. The fascinating article on this aspect in *HFN/RR* March 1977⁶ provides some evidence on this point; but it is worth taking things a stage further.

It has been shown^{5, 7} that reproduction at the top of the dynamic range can be significantly impaired by the premature action of certain circuits which are used to protect the power transistors against the ravages of secondary breakdown when the amplifier is driving hard into reactive loads, such as real loudspeakers of low modulus of impedance allied with wide phase-angle. This sort of impairment, however, always occurs at high levels, while most of the unmusicality seems to occur more towards the bottom of the dynamic range. Premature overload protection and normal overloading of the power amplifiers, while causing distress on high peaks, are unlikely to be a major cause of unmusical sound of the subtle type which this article is considering.

Slewing-rate limiting¹ and its attendant transient intermodulation distortion (TID) are other top-of-the-dynamic-range (and high-frequency) phenomena which are not very likely to be evoked by ordinary music material, whose maximum rise-time seldom exceeds 20 μ sec in my experience. Intermodulation products generated by two high-frequency signals (or a multiplicity of such signals, of course) and coming back into band is definitely a cause of impairment, which has already been considered.^{1, 2, 3}

Much of this trouble stems from the small-signal response extending well above the audio requirements, often into the radio-frequency spectrum, which is totally unnecessary. A 'rough' sounding amplifier whose small-signal response runs up to 100 kHz or more can often be made much 'smoother' sounding merely by the addition of a single-pole filter approximating 10 μ sec rise-time ($f_0 \approx 30$ kHz) between the output of the control amplifier and the input to the power amplifier.

Writing in *Wireless World*⁸ on the subject of non-linear distortion, M. Ojala concludes by stressing that 'dynamic distortions', of which TID is but one brand, are highly likely to have a bearing on the relative auditioning of amplifiers—a fertile hunting ground for those

seeking objective/subjective correlations. Writing in a recent issue of *The Audio Amateur* (an American publication), Walt Jung has focused on the technicalities of 'slewing-induced distortion' and its attendant TID, showing how the former can occur before the onset of slew-limiting; but minimal importance is given here to small-signal band limiting and the absolute equivalent rise-time of real music components. Writing recently on the subject of TID, Bert Sundqvist⁹ has shown that a TID-free amplifier obtains when the open-loop bandwidth is determined by the *first stage in the power amplifier*, revealing theoretically that even with an open-loop bandwidth of 1 Hz an amplifier need not produce TID (but what it would *sound* like he doesn't say!).

Using a realistic approach with an understanding of the impulse nature of the components of music signal, there is no need for a properly designed hi-fi amplifier to exhibit the effects of TID, and many amplifiers recently tested in our lab have been free of TID when fed with ordinary music signal. On the other hand, by feeding them with raw test signal whose demands greatly exceed those of ordinary music signal, it is sometimes possible to encourage them to yield TID, particularly when the small-signal response goes well into *rf*; but such a test is, of course, totally unrealistic.

Similarly, tests have been advocated¹⁰ for the detection of square-wave asymmetry in RIAA preamplifier stages, lack of symmetry being judged responsible for the relatively poor results of listening tests. Our lab has also investigated this technique using a digitally-generated squarewave of zero even-order components. Tests on a large number of pre-amplifiers have shown that asymmetry can certainly be produced, but only when the test signal impulse characteristics and crest-factor are well away from reality—that is, when the signal in use has very little resemblance to a real music signal produced by a pickup.

By band-limiting the square-wave *and* the differentiated waveform which results, after passing the band-limited square-wave through RIAA pre-equalisation, the results are almost in direct accordance with the pickup input overload characteristic! This has also been neatly investigated recently,¹¹ where it is clearly shown that by the use of a test signal that is well outside the range of music signal, pretty well any kind of distortion that you can think of can be produced and measured! This reference gives a far more realistic method of assessing RIAA preamplifier performance.

A large number of *subjective* tests conducted in our lab, using skilled and weighted listening panels, have indicated that differences are more dramatic at low levels, round and above the ambience floor of the signal (when each amplifier is set for a relatively high gain consistent with the dynamic requirements of the program material, and when the signal is operating each amplifier at some 20 to 60 dB below its rated power) rather than at the extreme top of the dynamic range, which *could* cause peak clipping, premature operation of the protection circuits or, indeed, TID.

It is difficult to describe in words the precise nature of the differences, but by changing from a bad amplifier to a good one, each adjusted to operate at exactly the same sound pressure level on the same program material, the differences at the lower end of the dynamic range with suitable material can be quite startling. The bad amplifier may be judged as gritty and lacking in definition. When changed for the good one there is suddenly a much more coherent rendering of the ambience and subtle low-level artifacts of the music. In extreme cases it is as though a veil has been lifted, giving a far greater transparency, coherence and firmness of sound. With the bad amplifier one is very aware of listening to the sound from loudspeakers; with the good amplifier the sound is firmly and fully contained, all the ambience components and music artifacts being in phase-sympathy so that one becomes far less aware of listening to hi-fi. Higher level sounds, particularly soprano

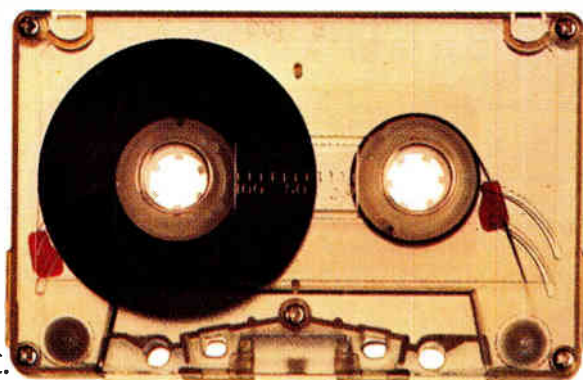
Do your cassettes Brahms & Liszt?

It's easy to tell if you've got an inferior make of cassettes. They tend to slur their speech and play staggeringly bad music.

In fact, on some cassettes, Mendelssohn sounds more like muddle sound.

Not on ours, though.

AudioMagnetics XHE are made to the highest standards to give sound reproduction that is as near perfect as possible. Their exclusive Magnalinc Ferric Oxide formulation will never



lower the tone of your Hi Fi. And, together with the cassette's unique Paraflo™ Guides provides a classic jamproof performance every time.

XHE is just one of a range of high quality, competitively priced tapes from AudioMagnetics—the largest manufacturer of blank recording tape in the world.

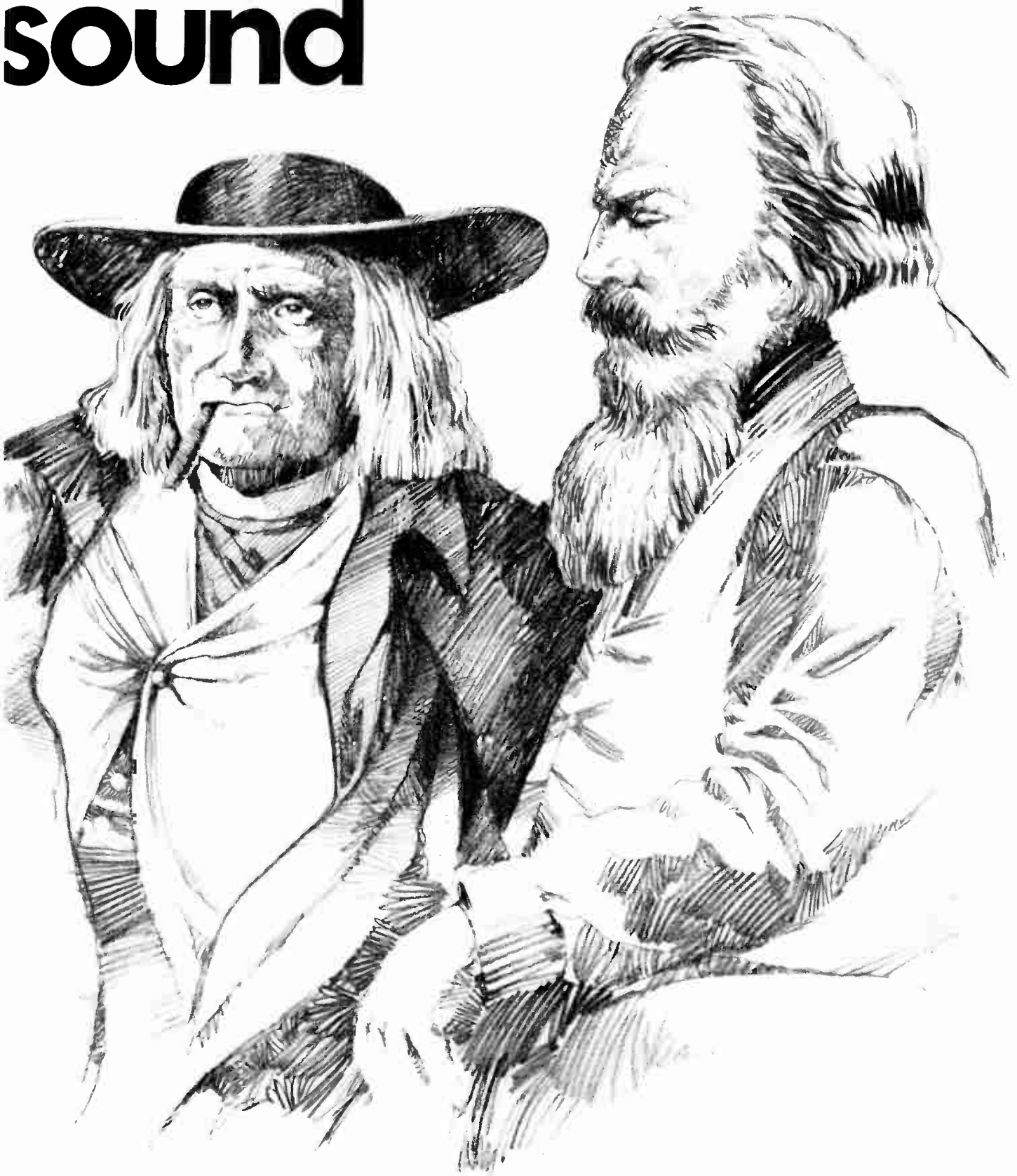
And the greats sound great on all of them.

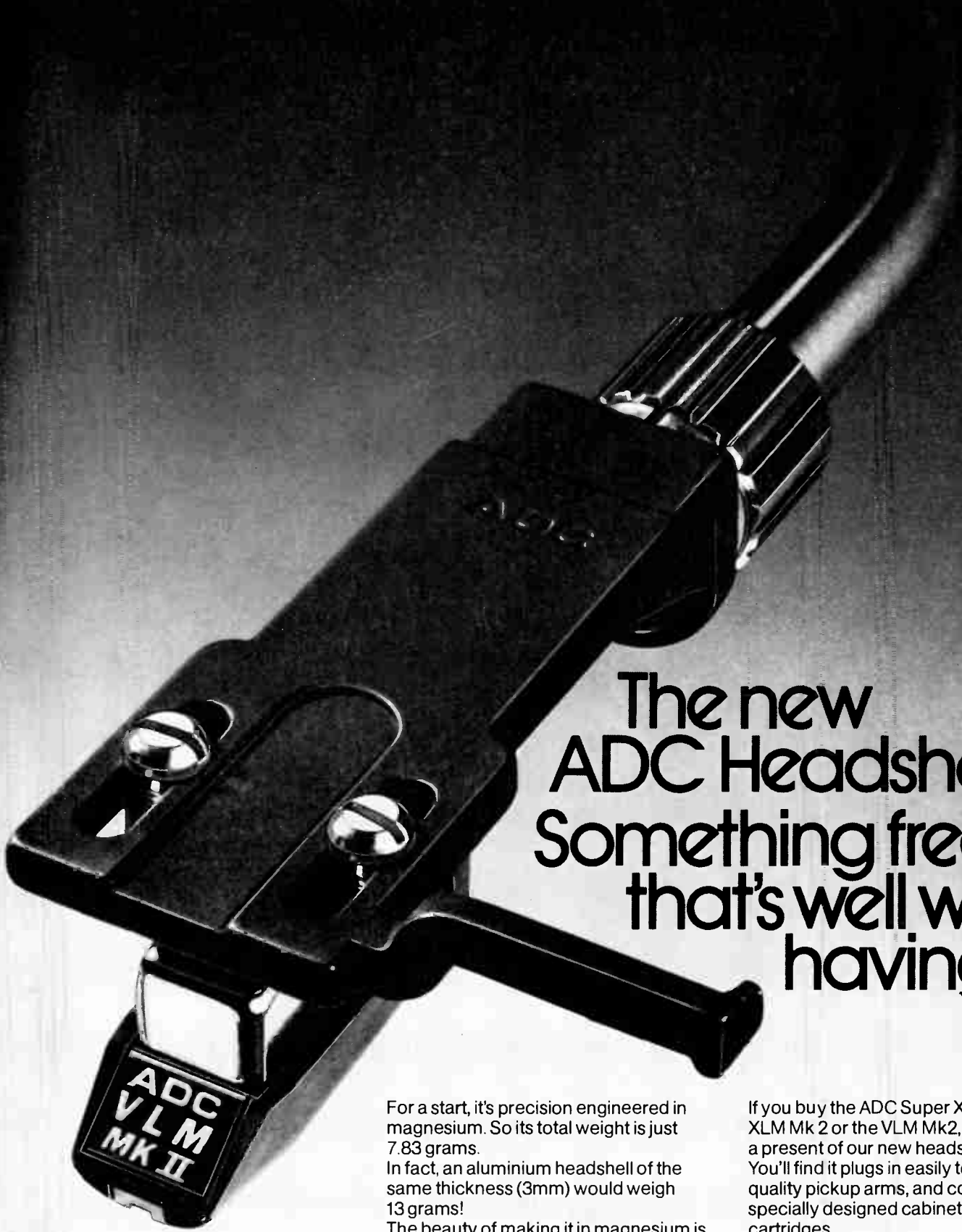


 **AudioMagnetics**
For people who only believe their ears.

AMSA MAGNETICS LTD., LOVEROCK ROAD, READING, BERKSHIRE, TEL: (07341) 598036

sound





The new ADC Headshell. Something free that's well worth having.

We built our reputation on ADC cartridges with their unique induced magnet system. They perform far better than most other cartridges. Now we hope to build another great reputation for the ADC Headshell. When you compare it to other headshells it has so many advantages.

For a start, it's precision engineered in magnesium. So its total weight is just 7.83 grams.

In fact, an aluminium headshell of the same thickness (3mm) would weigh 13 grams!

The beauty of making it in magnesium is also that it eliminates any twisting or resonance experienced with other types of headshell.

So the ADC Headshell has the perfect mass and rigidity for high compliance cartridges.

Naturally, it's particularly suited to ADC cartridges, perfect contact being ensured by 24 carat gold plated connections.

If you buy the ADC Super XLM Mk2, the XLM Mk 2 or the VLM Mk2, we'll make you a present of our new headshell.

You'll find it plugs in easily to most top quality pickup arms, and comes in a specially designed cabinet for three cartridges.



Distributed by BSR Ltd., Powke Lane, Cradley Heath, Warley, W. Midlands B64 5QH.

voice and strings, all then fit properly into the sonic scene.

With some amplifiers, both the steady-state and transient dynamics are adversely affected. The level at which the program signal is driving the amplifier, be it average or transient, continuously alters the sonic performance, giving a feeling of fatigue and extreme irritation. Suggestions are made that the tonal quality changes with changing dynamics, in opposition to subtleties provided by the musical instruments themselves. Overtones of a piano can change with different drive levels to the amplifier, changing the character of the piano with the dynamics.

In general, all these things are small in scale, but they can certainly be detected by carefully controlled comparison tests. At the top of the dynamic range the listening panel will, of course, react to peak clipping and overloads, whatever the cause, so these must be avoided. The nature of these latter impairments is more violent and less difficult to detect. They are more likely to occur when a transistor amplifier of limited peak voltage across the real loudspeaker load is driven to its threshold by the signal. A limited power valve amplifier, however, is far more tolerant in this respect, partly because a signal peak is not suddenly sliced off, and partly because thermionic valves require no protection against secondary breakdown. A valve amplifier goes progressively into overload, there being a certain amount of hysteresis involved, and so does not suddenly generate a rash of unpalatable odd-order harmonics as does an overloading transistor amplifier!

But at the low end of the dynamic range a valve amplifier can audition better than a transistor amplifier because of the order and nature of the harmonics. Relatively high amplitude even-order harmonics are acceptable (it is just as well that they are, as the even-harmonic distortion produced by a heavily recorded gramophone record can be well over 10%!)

We are in sympathy with the findings of Jean Hiraga,⁶ that it is not so much how low the total harmonic distortion is but more the order of the harmonics and how they fall in amplitude with increasing order. The best rate of roll-off for band-limiting is 6 dB/octave. This is in sympathy with Nature. It is likely that there is a correlating rule for harmonic amplitude fall-off.

A New Test Method

Jean Hiraga tested at 3 W steady-state, which is not particularly realistic in terms of music signal and does not examine amplifier dynamics. We have discovered that poorly judged transistor amplifiers change their distortion structure severely at different levels, while this change is far less apparent in the better amplifiers, whether valve or transistor. Here is an area of objective/subjective correlation which has not been fully explored before, but it is a truly exciting one, because the objective differences can be very great, and the differences *do* relate to the judgements given by a listening panel.

Over the months we have been testing a number of amplifiers (including the amplifier sections of hi-fi receivers) by listening to them, and by spectral analysis in the lab. For the latter, we first experimented with various signals, including a single-tone signal at different frequencies and two- and three-tone signals at both low and high frequencies, with displacements from 1 kHz down to 100 Hz. Two- and three-tone signals were found to yield no more information of the kind we were seeking than a single-tone, and a single-tone made analysis that much easier. Intermodulation products evoked by two- and three-tone signals tended to mask some of the more subtle, low-level changes in harmonic structure as the level of the composite output signal was decreased.

We also experimented with band-limited and filtered noise, but abandoned this not only because the difficult random nature of noise leads to inconsistent results, but also because our aim was a clean display showing precise harmonics and any spurious components that may be influencing the listening results.

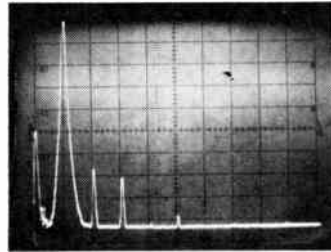
We tried different single-tone frequencies and found that the results were virtually the same, whatever frequency was adopted within the audio spectrum. Like Jean Hiraga, we also found that 200 Hz was a good choice; the fundamental falls in the lower mid-range, where hearing is fairly critical, while the harmonics enter the spectrum corresponding to maximum hearing sensitivity. For all the tests we used a frequency span from zero to 2 kHz (200 Hz/div) and for most of them a resolution bandwidth of 10 Hz and an overall sweep rate of 50 sec (5 sec/div). At very low levels it was necessary to increase the resolution by decreasing the filter

bandwidth to 3 Hz and slowing the sweep to 500 sec overall (50 sec/div). In all cases and at all levels the analyser's sensitivity was adjusted so that the fundamental peaked exactly to the top horizontal line of the graticule, corresponding to 0 dB, and the vertical scale was set to 10 dB/div, thereby allowing us to analyse any component right down to lower than -90 dB (less than 0.003%), assuming a clean noise floor.

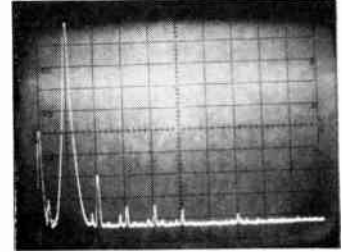
We first analysed at the amplifier's rated power (0 dB) and then at several lower levels down to the noise floor, depending on the noise (including hum) performance of the amplifier and its rated power. Input was applied to tape or auxiliary at 20 dB above the rated sensitivity, and the output was adjusted by the volume control—all filters, etc, switched out.

Amplifier A

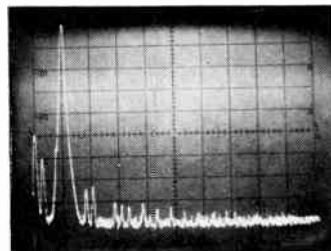
This is the amplifier section of the Harman-Kardon 330C receiver, A1 at 0 dB, A2 -20 dB, A3 -30 dB and A4 -40 dB. Notice how dramatically the harmonic structure changes with output, as though each analysis refers to an entirely different amplifier! For each level



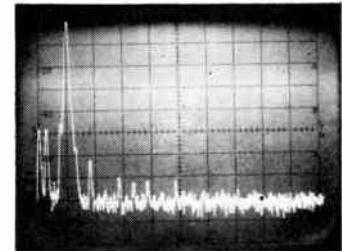
A1 0 dB



A2 -20 dB



A3 -30 dB



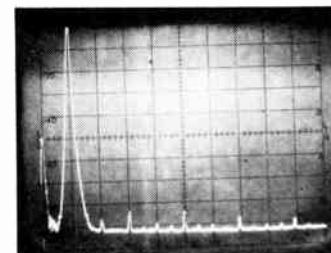
A4 -40 dB

an entirely different transfer characteristic is produced, and it would be possible, preferably with computer assistance, to plot each one. Thus each time the level changes the operating conditions of the amplifier also change, which is tantamount to effective 'modulation' of the transfer characteristic by the program material dynamics.

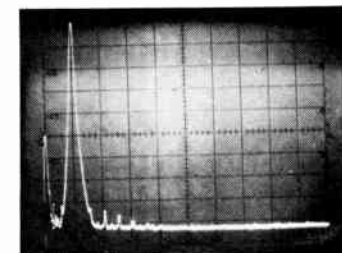
You will notice that with falling level the power supply fundamental and harmonics become increasingly important, in A4 this fundamental being at -49 dB, its 3rd harmonic at -45 dB and all the others well down. In fact, the overall performance of the 330C was judged acceptable—mild unpleasantness in the middle highs—and was not harshly criticised in comparison with other transistor designs.

Amplifier B

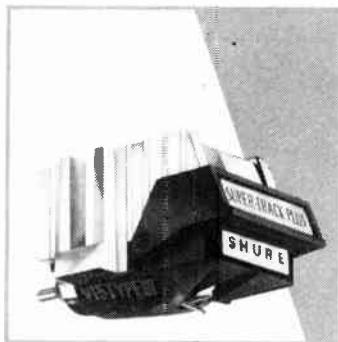
The amplifier section of the recent B & O Beomaster 4400 receiver, B1 at 0 dB, B2 -20 dB, B3 -40 dB and B4 -70 dB (analysis down to the latter level was feasible owing to the fine noise/hum performance). At high-level the odd harmonics are more prominent than the even ones; but this changes at -20 dB. A smooth harmonic roll-off is indicated at -40 dB, which is a



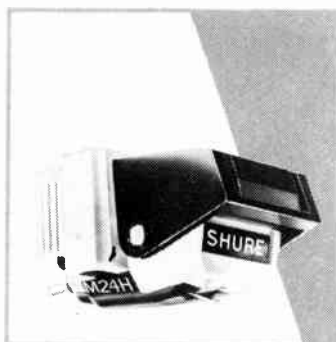
B1 0 dB



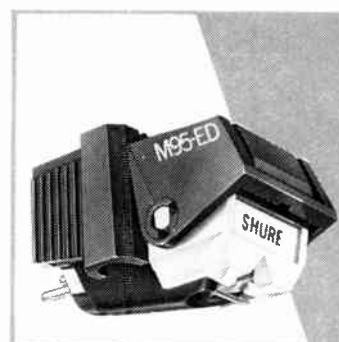
B2 -20 dB



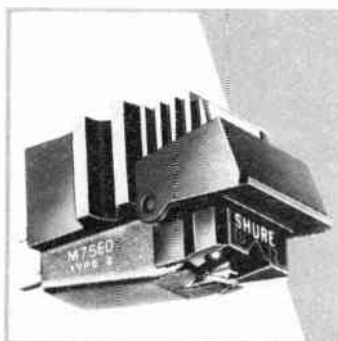
V-15 Type III . . . critics called the Type III the finest cartridge ever when it was introduced. The ultimate test, however, has been time. The V-15's engineering innovations, the uniform quality, and superb performance still make it the classic choice for the finest music systems today. 3/4 to 1-1/4 gram tracking force.



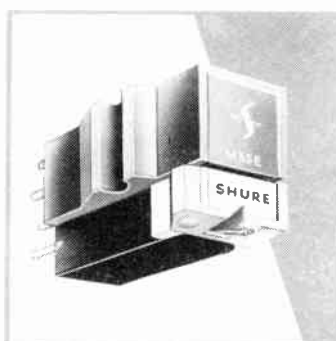
M24H . . . the cartridge that does not compromise stereo reproduction to add four-channel capability. Superb stereo trackability and quadriphonic carrier signal retrieval. New hyperbolic stylus tip, high energy magnet, and low-loss laminated electromagnetic structure. 1 to 1-1/2 gram tracking force.



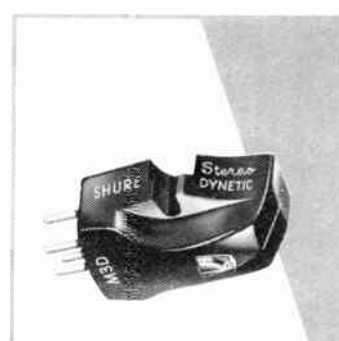
M95ED . . . second only to the V-15 Type III in stereo reproduction. A thin, uninterrupted pole piece minimizes magnetic losses. Its 20 to 20,000 Hz response remains essentially flat across the entire frequency range for excellent sound quality. 3/4 to 1-1/2 gram tracking force.



M75ED Type 2 . . . excellent trackability at a lesser price. The M75ED Type 2 features a built-in snap-down stylus guard and a smooth 20 to 20,000 Hz frequency response. 3/4 to 1-1/2 gram tracking force.



M55E . . . a long time favourite because it offers Shure quality at a budget-stretching price. Incorporates a biradial elliptical stylus tip. 20-20,000 Hz frequency response. 3/4 to 2 grams tracking force.



M3D . . . the original famous Shure Stereo Dynamic® Cartridge. The M3D provides extremely musical and transparent sound at a rock bottom price. 3 to 6 gram tracking force.

The Enthusiasts' Choice-World-wide.

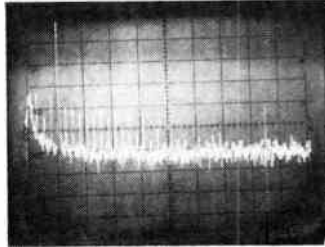
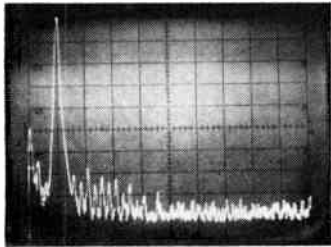
From Singapore to London to New York, Shure hi-fi pickup cartridges outsell every other brand — according to independent surveys. And for good reason: Shure cartridges, no matter where they're purchased, will meet the exacting published specifications that have made them world favourites in every price category. A fully illustrated brochure is available on request.



Shure Electronics Limited, Eccleston Road, Maidstone ME15 6AU—Telephone: Maidstone (0622) 59881

critical level, while at -70 dB only the 'hum' components remain, but are still some 40 dB below the -70 dB drive!

At normal listening levels this amplifier was very well liked, giving a very clean, smooth sound with highly defined music artifacts; but at high levels it was judged to be mildly on the hard side.

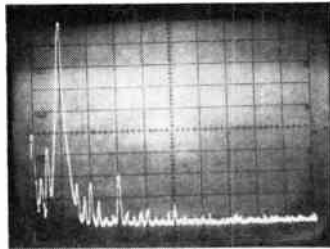
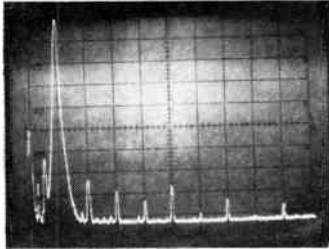


B3 -40 dB

B4 -70 dB

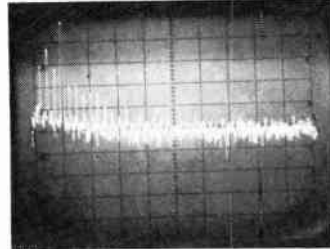
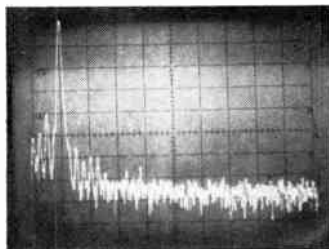
Amplifier C

The amplifier section of the relatively low power Toshiba SA-220L receiver, C1 at 0 dB, C2 -20 dB, C3 -40 dB and C4 -70 dB (again, an amplifier of good noise performance). At high-level the harmonic roll-off commenced desirably, but is impaired by the odd harmonics at 1, 1.4 and 1.8 kHz. At -20 dB there was a disturbing rise in 600 Hz third harmonic. Second harmonic (with hum) predominates at -40 dB, while at -70 dB we are left essentially with power supply components.



C1 0 dB

C2 -20 dB



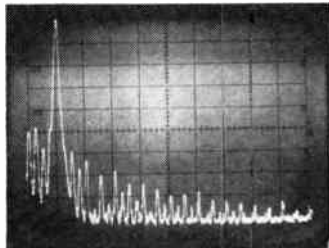
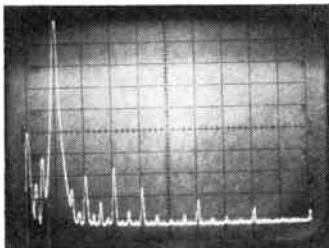
C3 -40 dB

C4 -70 dB

This amplifier was liked less than the previous two, particularly at high level where there was a tendency to clip owing to the power limitation (8+8 W 8 ohms).

Amplifier D

The amplifier section of the inexpensive though well equipped Amstrad 5050 receiver, D1 at 0 dB, D2 -20 dB, D3 -40 dB and D4 -70 dB (the latter taken mainly to analyse hum components). At high-level, even and odd harmonics are present, the third

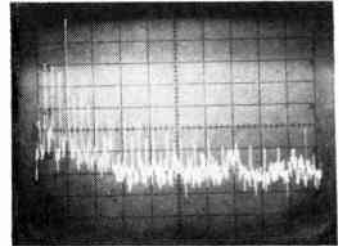
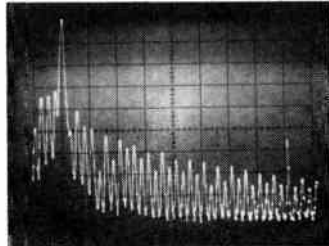


D1 0 dB

D2 -20 dB

predominating and the even ones continuing across the spectrum. If it wasn't for the 3rd this would be a good distribution. At -20 dB the distribution remained in desirable formation, though even at this level hum components were showing up well. At -40 dB the hum components are really severe in number if not in amplitude (still 40 dB and more below the driving signal), but at -70 dB on the slower sweep and smaller analysing bandwidth they are only some 20 dB below the driving signal.

This sample was favourably marked for transients and higher s.p.l.s but scored fewer marks for the frequency ambience. It must be stressed that in all cases we are considering very small-scale subtleties, particularly around ambience level, as have already been noted.



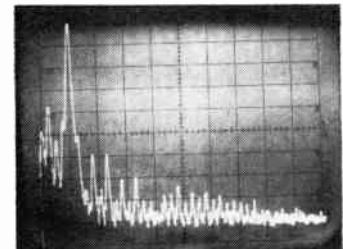
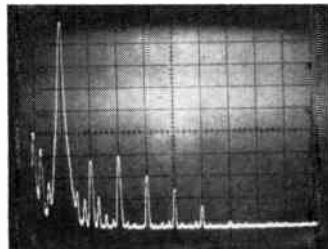
D3 -40 dB

D4 -70 dB

Amplifier E

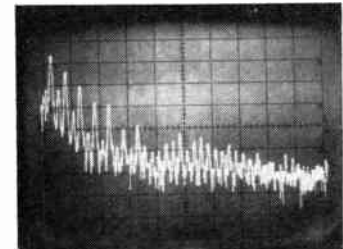
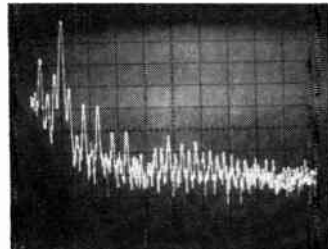
An early Sugden A21 Class-A design, E1 at 0 dB, E2 -20 dB, E3 -40 dB and E4 with the analyser sensitivity for -40 dB but with the driving signal removed to show the spurious hum components. To be fair, it must be stressed that this amplifier has been out of action for some time, so there could have been deterioration of the electrolytic capacitors, leading to a higher than normal hum level.

The first thing that shows up at 0 dB is the good harmonic distribution; if the 3rd harmonic had been 3 dB lower the distribution would have been perfect. At -20 dB we have to look carefully for the harmonics of the signal, picking them out from the hum harmonics. The 2nd harmonic is below -75 dB, the 3rd below -80 dB and the rest totally hidden. At -40 dB the signal harmonics are well below the general mains mush.



E1 0 dB

E2 -20 dB



E3 -40 dB

E4 as E3 (showing Ripple spectrum)

In spite of the abnormally high 'ripple' level, this amplifier was very well liked at high and medium levels; but at low levels the definition was markedly impaired, as though the 'phasing' of the low-level sounds was being affected by the supply harmonics, resulting in lack of coherence and random disembodiment of the artifacts round ambience level. The general background 'purr' was not unduly obtrusive (for, after all, the hum components are -60 dB or so relative to 0 dB); but with transistor or valve Class-A amplifiers hum can be more troublesome than with Class-B owing to the high power supply current at low output as well as high.



PHILIPS

"HOW A CHEAP PICKUP RUINED MY LIFE"

"I'll never forget that heavy, insensitive touch. It's marked me for life. I just can't respond any longer."

This is the tragic story of a ruined record.

You can put an end to such senseless destruction of expensive records. Make sure your pickup cartridge is a Philips Super M.

The 7mg Magnet. Super M is a material that generates an immensely powerful magnetic field for its weight.

The magnet we attach to the stylus weighs less than one tenth of a postage stamp. Because it's so light, the stylus can follow every variation in the record groove.

It picks up nuances that less sensitive cartridges miss.

The wear on your records is very low indeed.

The Perfect Pickup. A good hi-fi system can cost hundreds of pounds. Naturally you want the best performance it can give.

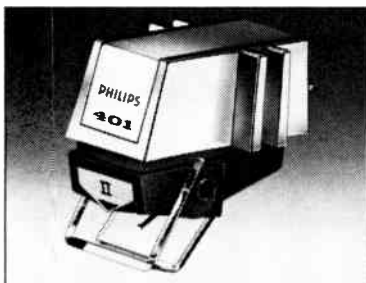
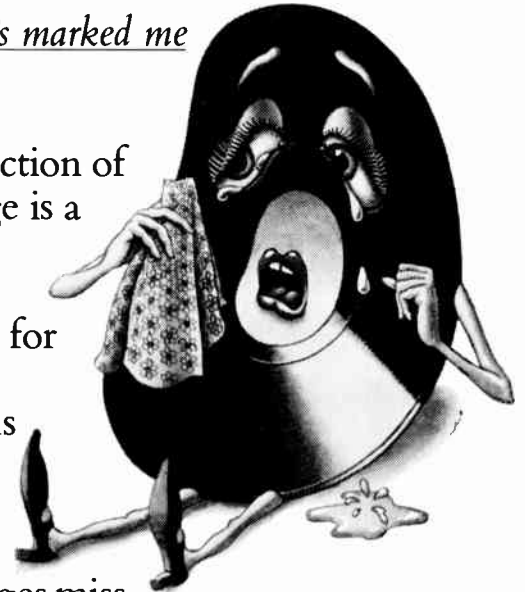
The quality of the sound reproduction depends very much on the quality of your cartridge.

And whether it is the right type for your deck.

Super M-'Kind to records!' There are four Super M cartridges in our range. Each one is suitable for most quality hi-fi systems.

Each one gives fine quality sound reproduction. And they're all very kind to records.

Simply years ahead.



Please tell me more about Philips Super M Cartridges.
Philips Electrical Ltd., Department SP, P.O. Box 3, Horley, Surrey.

Name _____

Address _____

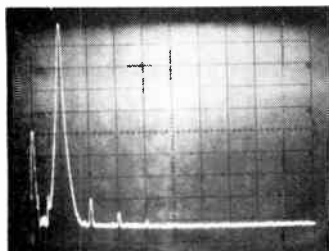
HFN3

With the 'ripple' cut by another 30 dB this amplifier would have received very high acclaim.

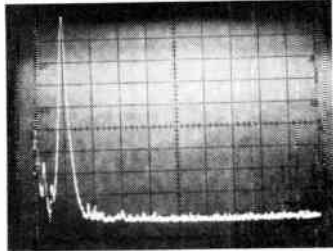
Amplifier F

The Alba UA900 amplifier, F1 at 0 dB, F2 -20 dB, F3 -40 dB and F4 -60 dB. At both 0 dB and -20 dB (if you can pick out the harmonics) the distribution is excellent. At -40 dB the spectrum is remarkably clean, while at -60 dB the higher-order frequency components are insignificant.

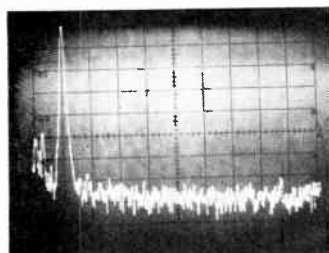
This amplifier was highly ranked for reproduction at all frequencies. It was judged to be particularly clean, smooth and



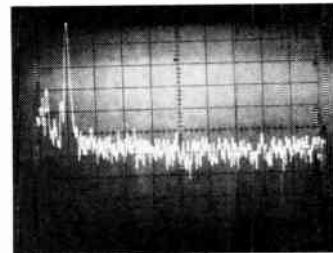
F1 0 dB



F2 -20 dB



F3 -40 dB

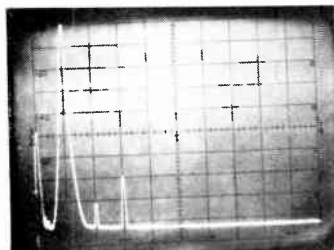


F4 -60 dB

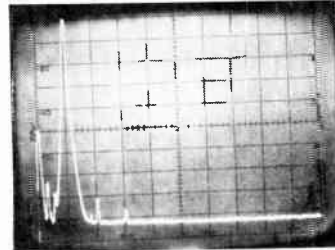
free from harshness. Little wonder, then, that it came out top in a detailed listening panel test.² Our current objective tests here show an amplifier which changes its harmonic structure very little with change in dynamics, and one which is especially free from high-order 'ripple' components. In other words, an excellent subjective/objective correlation as well as an excellent performance.

Amplifier G

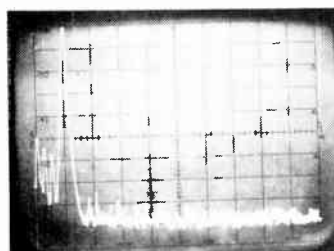
The amplifier section of the Hitachi SR-903 receiver, G1 at 0 dB, G2 -20 dB, G3 -40 dB and G4 -70 dB. This is an interesting amplifier because it is of so-called 'Class-G' design (sometimes called 'Class-E' in America). It uses a main power amplifier which



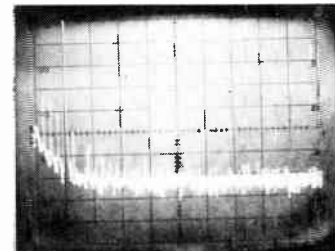
G1 0 dB



G2 -20 dB



G3 -40 dB



G4 -70 dB

delivers all the required steady-state power (at least 75+75 W 8 ohms over the full audio spectrum) and a secondary amplifier which is switched by specially developed diodes on signal peaks of

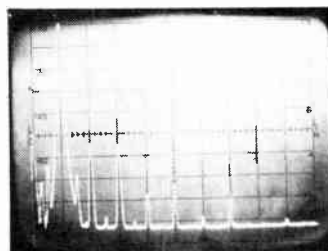
a level considerably in excess of the peak of steady-state signal at full power. In other words, it is able to accommodate peaks of music which would put an equivalent power amplifier into overload. The scheme really works, endowing the amplifier with a high music-power rating, and no switching transients etc. were detected.

At 0 dB the 3rd harmonic is about 11 dB greater than the 2nd harmonic; but at -20 dB a more sanitary state obtains, as shown, and this holds well into noise. It is interesting to note that the main 'ripple' component is some 33 dB below -70 dB, or 103 dB down ref. rated power!

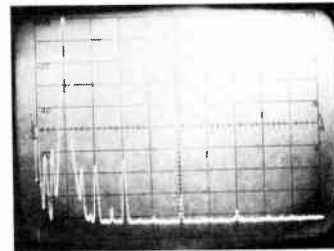
Except at very high peaks, where a vague 'hardness' was detected, the sound of this amp was well liked; but not as well as the UA900.

Amplifier H

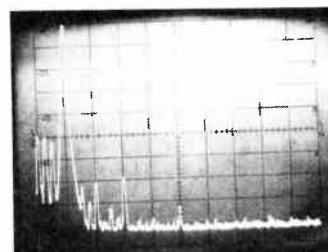
This is an early Mullard valve design using a pair of EL84s in push-pull with moderate negative feedback, H1 at 0 dB, H2 -10 dB, H3 -20 dB and H4 -30 dB. As with the Sugden Class-A design, this amplifier suffers more from 'ripple' components than some of the more recent quasi-Class-B designs. At 0 dB, close to the peak clipping level, harmonics up to the 9th can be seen, but these quickly shrink as the power reduces. Looking at the 2nd and 3rd harmonics, it will be seen that the harmonic structure remains pretty constant right into the noise floor, indicating far less change in the effective transfer characteristic with program dynamics than is the case with some of the more recent transistor amplifiers.



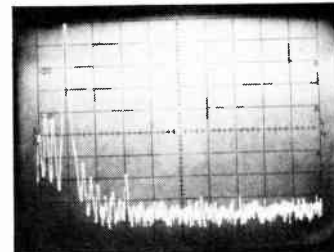
H1 0 dB



H2 -10 dB



H3 -20 dB



H4 -30 dB

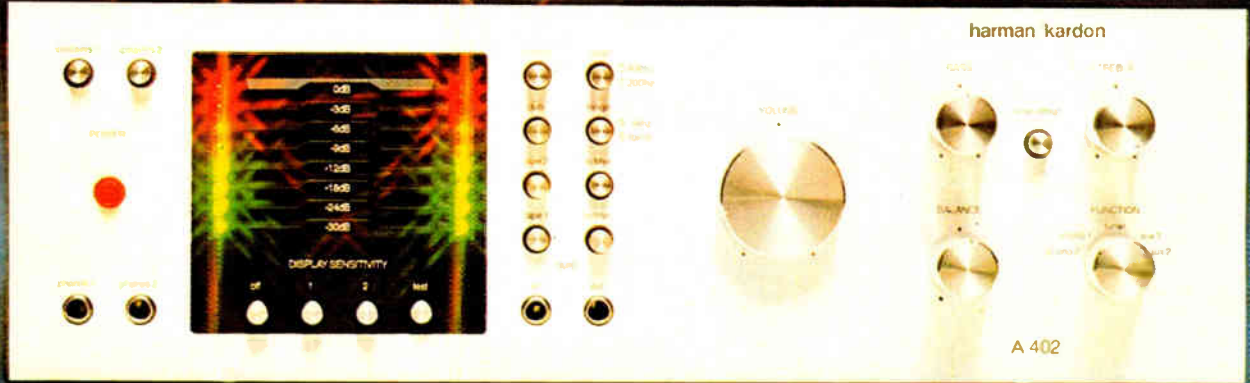
The sound of this amplifier was judged to be similar to that of the Sugden A21. As an experiment, very large electrolytic capacitors were externally hooked on, and the distance between the power supply and the amplifier proper was increased. The hum was thus cut by a further 10 dB and a very musical amplifier resulted. Experiments were also made with the negative feedback. Reducing this increased the amplitude of the harmonics and produced more high-order ones, but in spite of this the amplifier still remained highly musical, though the reduced feedback did cause the ripple to rise again! ●

References

1. Gordon J. King, Slewing-Rates Rise-Time, and Settling-Time *HFN/RR*, Feb. 76.
2. Gordon J. King, Ten Amplifier Test, *Practical Hi-Fi and Audio*, May 1976.
3. Gordon J. King, Loudspeaker/Amplifier Compatibility, *Hi-Fi Sound*, June 1976.
4. Gordon J. King, Loudspeaker/Amplifier Interface, *HFN/RR*, Dec. 1976.
5. Gordon J. King, Old Wives' Tales, *Hi-Fi For Pleasure*, March 1977.
6. Jean Hiraga, Amplifier Musicality, *HFN/RR*, March 1977.
7. Angus McKenzie, Loudspeaker/Amplifier Interface, *HFN/RR*, Jan. 1976.
8. M. Ojala, Non-Linear Distortion in Audio Amplifiers, *Wireless World*, Jan. 1977.
9. Bert Sundqvist, Transient Intermodulation Distortion in Amplifiers, *Wireless World*, Feb. 1977.
10. T. Holman, New Factors in Phonograph Pre-amplifier Design, *J. Audio Eng. Soc.*, May 1976.
11. D. Preis, Impulse Testing and Peak Clipping, *J. Audio Eng. Soc.*, Jan./Feb. 1977.

£240. The Charge of The Light Brigade.

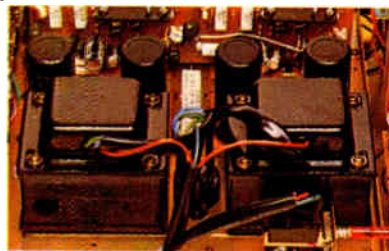
The A402 Amplifier by Harman Kardon.



Undoubtedly the first thing you'll notice about the brand new Harman Kardon A402 Amplifier is its very impressive Light Emitting Diode power output display – not only unique at the price, but absolutely unique in an integrated amp.

But some of its other features, though rather more subtle, are at least as impressive. For instance, conservatively rated at 40 Watts Per Channel, it packs a lot of punch. With the latest refinement of the Harman Kardon Twin Power Supply configuration, it'll keep on delivering clean power. Right to the limits of its output – when similarly rated conventional amplifiers are gasping for breath.

HK Twin Power – two transformers, two completely independent power supply systems – (shown right) overcomes the problems of distortion and crosstalk which conventional amplifiers can suffer when driven hard.



The new A402 boasts wideband performance (from 4Hz to 160kHz) across a significant portion of its output. It's also designed to the more critical square wave standards (most manufacturers still seem to be content to test their designs for sine wave performance only). It's a difference we can tell you more about in the booklet on square wave tests that we'll be happy to send you.

It has a 'hinged' tone control system which allows you to alter the characteristics of the tone controls – effectively giving you twice the range of control, at the press of a

button. And, of course, it has the LED display. Eight colour coded LED's per channel display output power in decibels, giving continuous, precise monitoring of performance. More accurately and reliably than any meter could.

Conservative specifications mean that the A402 you buy will not only out perform other amps in its class, it'll almost certainly out perform its own published specs.

Power Output:

40 Watts RMS per channel both channels driven.

Frequency Response:

4Hz to 160kHz –3dB.

4Hz to 100kHz –1.0dB.

Total Harmonic Distortion:

0.1% from 250 milliWatts to 40 Watts.

Intermodulation Distortion:

.08% (40 Watts-SMPTE)
.04% (1 Watt-SMPTE)

Impressed? . . . well, don't be blinded by bright lights and great specifications, because most of all you'll be impressed by *listening* to the A402.

You can hear it at your Harman Kardon dealer now.

harman/kardon

Harman Kardon, Tannoy Products Limited, St. John's Road, Tylers Green, High Wycombe, Bucks HP10 8HR

Please tell me more about the brand new HFN2
HK A402 Amplifier and about square wave tests.

Name _____

Address _____

_____ Postal Code _____

Re-assessment of recent 'star' quality recordings and re-ratings for some others; comments based on actual releases, not test-pressings. Following equipment employed:— Cartridges: Shure V15/III, Onlife DV38/20B, Supex SD900, Satin M18E. Arms: SME 3009 Imp., Grace G707. Turntables: Thorens TD 125, Linn Sondek LP12. Amplifiers: Quad 33/303/405, Radford STA25, Nairn NAC12/NAP160. Loudspeakers: Crabbe/IMF, Quad, B & W DM6/DM5, KEF 104, Spendor BC-1.

The equipment used by the QM team is not claimed to be the best available, but should be representative of high quality domestic installations.

Quality Monitor

TWENTY-FOUR recordings this quarter, so widely ranging in musical genre that we are taking the easy way out by placing them in alphabetical order of composers. But first two collections, one for mouth organ and one for church organ.

Tommy Reilly's harmonica with Neville Marriner's Academy, performing pieces by Moody, Jacob, Tausky and Vaughan Williams on Argo ZRG856, captivated J. A., who granted a double star in March. He noted that 'the harmonica is never unnaturally loud or close', although the gramophone perhaps permits a degree of 'unnaturalness' with an instrument which can never really compete with a full orchestra, and we feel that this has been done here—albeit very discreetly. We happened to attend a concert recently in St. John's, Smith Square, where this recording was made, and sat near the front for an orchestral song cycle. This gave just the sort of slightly spottit balance for the voice that one gets here with the harmonica, so perhaps one really *is* in that ideal concert-hall seat after all. The Academy players are given their famous smooth but brilliant sound, providing a spacious backcloth for the soloist, but with xylophone and other items popping up very effectively from time to time. Star confirmed for a slightly gramphonic sound of top grade.

Gillian Weir's *pot pourri* of organ works on Argo's *The Organ at Hexham Abbey* (ZRG864) was highly praised by T. A. in March. The star rating is confirmed, our only reservation concerning some pressing rumble, noticeable particularly at beginnings of sides on the QM copy. The recording is rather close, but this allows considerable detail to be heard and will probably be liked by all organ enthusiasts. And those who don't normally consider organ records will find this a thoroughly satisfying issue, of admirable performance, recording *and* variety.

H. O. gave Alwyn's *Symphony 1* (LPO/Alwyn on Lyrita SRC586) a warm recommendation and **A*** rating in April, for a recording 'wonderfully firm and round with a splendid presence, a most satisfying perspective and natural dynamics'. We fully endorse both rating and comments. This is the sort of impact and depth we expect from the very best orchestral recordings, and a sort of luminous clarity that makes for an overwhelmingly *musical* experience.

'An album not to be missed' wrote C. B. at the end of his March review of Bernstein's

double-album Beethoven concert (with Arrau and the Bavarian RSO) on DG 2721 153, granting **A/A*** for sound. The qualified rating is not explained—unless by 'some rostrum thumps'—but Piano Concerto No. 4 has a slightly over-emphasised solo instrument and its supporting orchestra rather lacks impact and is a little weak in the bass (although our copy would tolerate some bottom boost, being free of pressing rumble), so we will take the concerto as the **A** part. *Symphony No. 5* and *Leonora III* are brilliant and full-bodied—slightly overbright on the brass at times, but superb with a little treble cut. There is some doubt whether the recording was made at or simply in association with a public concert (both concert and recording were in aid of *Amnesty International*), but although there are no signs of applause even after a long decaying reverberation at the ends of works, there are what sound like occasional coughs. Perhaps they were rehearsal takes? But anyway, 'not to be missed'.

Smaller scale and earlier Beethoven on the same label (DG 2530 799) gained an unqualified star from the same critic in April. In the VPO Chamber Ensemble's recording of the *Septet*—with the short *Fugue in D* as a filler—C. B. noted that 'the instruments are precisely defined in space, in depth seemingly, as well as laterally, and ambience is similarly conveyed'. We agree, and would simply add that Hafler helps to place the listener *in* the spacious chamber apparently set around the players. Excellent.

In April J. F. awarded a star to a Brahms set of Folk Song arrangements performed by Mathis/Schreier/Engel on DG 2536 279. While admitting the overall excellence of the recording, we feel we must withdraw the star due to rather intrusive surface noise—and DG too! The material, which consists of solo and duet vocals with reticent piano accompaniment, naturally places a premium on a silent background, but regrettably gentle surface noise was audible throughout on the QM copy. The piano recording is very natural and placed in the background with a rather dead acoustic, although the two vocalists, particularly Edith Mathis, would be considered rather too closely miked for many people. Reduced to **A**.

Lute Music of John Dowland performed by Julian Bream (RCA RL11491) must be, as claimed in the April review 'an outstanding issue in every way'. For sheer technical and artistic presentation, this recording is a fine example of total communication between man and machine. Like P. T.'s copy, ours was totally flawless, which can only reassure one's (often lacking) faith in the record industry. P. T. also said that 'the recording is of clinical clarity' and 'a shade too closely miked', the latter assumed from the audibility of Bream's breathing and body move-

ments, but the former appreciated for the overall instrumental impact. We must agree with the small qualifications, but emphasise that they hardly spoil an outstanding recording. Rating confirmed: **A/A***.

An upgrading for Finzi: concerto-type works on Lyrita SRC592, with Denman/Katin/NPO/Handley (reviewed April). We tend to agree with H. O. about the Clarinet Concerto, where the solo instrument—despite being very nicely recorded—is a little subtle and can get pushed down by rather prominent strings. We add an **A*** to his **A/B** rating, however, for the excellently captured piano—particularly the bass end—in the *Grand Fantasia*. A fine record.

One of the most interesting of recent releases from the technical angle was the CBS recording of Gershwin's original version of *Rhapsody in Blue*, with Michael Tilson Thomas conducting Gershwin (*à la pianola*) and a recreated 1924 Whiteman orchestra (76509). Reviewed in February, it received a plain **A**, P. G. having reservations about the piano sound although commenting on the excellence of the recording. However, repeated listening has convinced us that the recording is indeed almost worthy of a star, the slightly wooden piano tone probably being due to the piano itself, a 'grand' equipped with a Duo-Art piano-roll mechanism. The band instruments are very realistically recorded—dig the bass clarinet behind the first solo piano passage for instance—and quite precisely placed in the image. The small force of eight violins is not enlarged in any way: it's good to hear a proper balance between strings and wind without the slightly cloying lushness of Ferde Grofé's second orchestration for symphony orchestra. Dance bands rule here, OK? There is a kind of glossy hardness overall, though, but a fair rating would be **A*/A**—with **A** for *An American in Paris* on the other side, where the NYPO's sound is somewhat brash compared with the *Rhapsody's* smaller group.

Haydn quartets played by the Quartetto Italiano on the Philips label (9500 157) could hardly go seriously wrong, and sure enough the 'Emperor' and 'Sunrise' (Op. 76, 3/4) received high praise in May and were starred for sound. 'Exquisitely balanced' was P. B.'s phrase, and we agree, although we couldn't fully share his impression that the quartet could easily be playing in one's own room. There is surely rather too much reverberant space behind the players for that, and they are given a roundness of tonal balance to suit such a space. On the other hand, they occupy about two-thirds of the sound-stage and therefore need a somewhat closer impact than is actually offered. The sound is not dim, but it hasn't *quite* the combination of brilliance and smoothness noted, for instance, from the same group's Beethoven Rasumovsky album commended in QM, April 1976.

But we haven't the heart to take P. B.'s star away from this lovely issue, so suggest a compromise: **A*/A**.

Zubin Mehta's Decca recording of Mozart symphonies 34 and 39 with the Israel Philharmonic (SXL6833) was given a qualified star rating in March, despite reservations about the interpretation. The recording is very clear, with much detail apparent. We agree with K. D.'s comments on audibility of the inner voices, especially in the wind section, which doesn't mean that they are in any way intrusive—for example, as the review instances, the second clarinet in the Minuet of the E₃ symphony is at just the right level. Image is a little hazy overall, perhaps, hence **A*/A** (with the star predominating!).

Slightly out of order here because of some instrumental kinship with the subsequent Prokofiev issue, Mendelssohn's two Violin Concertos played by Accardo with LPO/Dutoit were rated **A*/A** by C. B. in March (Philips 9500 154). The sound is spacious, clear and clean, with the solo instrument perhaps just a little forward—though Accardo's bright tone may be the real cause of the slight apparent protrusion. Generally, the orchestral backcloth is just that—a backcloth—without a great deal of detail though not particularly distant. But the works don't demand more. We did feel at times during the famous E-minor work that the orchestral texture was perhaps a little too heavy, but the D-minor's smaller orchestra sounds extremely effective and is a delight to listen to. Assuming this to be the star-worthy side, rating confirmed.

Another pair of violin concertos from one composer: Prokofiev, featuring Kyung-Wha Chung with the LSO under Previn on Decca SXL6773. The acoustic here is much bigger (Kingsway Hall), offering a generally grander sort of reverberant setting appropriate to the more massive orchestral scoring. Again, the soloist seems a trifle forward in balance, though seemingly varying somewhat in No. 1, where the opening suggests that the solo violin is set well back—yet it sounds scratchily near later on. In his March review H. O. gave this side a rating of **A/B**, and **A*** for Concerto No. 2 on the other side. This seems fair enough, and No. 2 really is splendid, with some impressive bass.

Upgrading for Puccini's *Tosca* (Philips 6700 108). In May, A. J. gave this Caballé etc/ROH/Davis set an **A** rating. On a further listen, however, we were so knocked out by sheer rich sonority that we here add a star. Wonderfully rounded strings, fine vocal/orchestral balance (no constantly over-close singers) and vivid stereo placement support a sound of mindblowing impact—hugely spacious yet brilliant and clear, and underpinned with some splendid bass. Those great climaxes at beginning and end are things of wonder to bring you out of your seat, and even the very complex end of Act 1 comes out excellently balanced. Soundwise, the undoubted recommendation. Surfaces (as we always seem to be saying about Philips records) of exemplary perfection. Producer, engineers and recording venue not mentioned anywhere—a pity.

Greatly impressed by the Strasbourg/

Lombard recording of Ravel 'pops' on Erato STU70930, G. J. granted an **A/A*** rating in his April review, reserving the unadulterated star for 'a supremely natural sound experience' in *Daphnis et Chloë*: 2. However, we feel that this splendidly spacious but brightly clear recording—with the orchestra surrounded by a lovely hall ambience—is also of star quality in the *Bolero* and *La Valse*, our only small reservation concerning a possible slight weakness in the deepest bass. Hafler works well, particularly in *Bolero* where the gentle succession of instruments used to paint the hypnotic theme in changing tone-colours are placed even more convincingly in a real hall when the rear speakers are switched on.

It seems that Neville Marriner and the ASM are at the stage where they cannot put a foot wrong. Their recording of Respighi's *The Birds* and *Three Botticelli Pictures* (HMV ASD3327) was given an **A*** in March by C. B. and we wholeheartedly concur. Instruments are very sharply defined in the stereo image and the strings in particular have a lovely cutting edge without the open strings becoming too harsh—courtesy Messrs. Bishop and Parker. Upon adding Hafler rear speakers, the instruments remained in position between the front speakers, while a very convincing concert-hall ambience spread around and behind. A very satisfying and realistic recording and one of the best SQ issues (in stereo) we have heard—but, oh dear EMI, why do your translucent sleeves generate so much static?

In April H. O. awarded a star to Lyrita's

Heads you win

Why



C901

Hi-Fi Stereo 4-Track Auto-Reverse deck with DUAL continuous pole/synchronous motor. Automatic shut-off system with continuous play. Incorporates Dolby* noise reduction system to reduce tape hiss. Has automatic bias switching for standard and chromium dioxide (cro₂) tapes.



recording of Scott's 2nd Piano Concerto and *Early One Morning*, with Ogdon/Herrmann/LPO (SRCS82). While the orchestra is spacious and full-bodied in the Lyrita tradition, detail and impact did not quite match the best of this company's releases. In a very reverberant hall containing the orchestra set fairly well back, the piano seems somewhat closer and larger than would be natural. The main gripe however is the tonal quality of the piano, which may be best described as uningratiating, while the surfaces of the QM copy were not particularly silent. This may seem a long list of complaints, but they are all fairly minor, and while the recording does not in our view really merit a star, a straight **A** is well deserved.

In his April review of the Boston/Davis Sibelius Symphony No. 2 on Philips 9500 141, H. O.'s only sonic reservation concerned the wide separation, while he praised all other aspects of the recording—especially the impact achieved when playing in a smallish room—and granted a star. Well, in a largish room where one can sit a fair distance back from the speakers we found the lateral imaging excellent, with the orchestra really filling the whole sound-stage while remaining reasonably set back; yet the impact from some other points of view was less impressive, as the dynamics could, we feel, have been a little wider without distress. In general the sound is very good, with no obvious instrumental anomalies, although rather more hall ambience would have been welcome: the sound seemed a little too 'neutral' in this respect. In the second

movement, Colin Davis' exceptionally long pauses in places seemed to call for a longer reverberation time for proper effect; as it is, the sound seems to fall into the (very low) background noise long before the next phrase starts up, which is a little disconcerting.

In view of the apparently low level of ambience we were surprised to find that Hafler adds a lot—especially in the mid-bass, which seems to include a large out-of-phase component which really envelops one, for example, during the long and magnificently sustained build-up to the finale. But overall, this issue hasn't *quite* the clarity, brilliance and dynamic impact of the best Philips issues and we feel that a plain **A** would be more appropriate. But it is right at the top of that grade.

DG's LPO/Dutoit Stravinsky *Petrushka* (2530 711) was starred by C. B. in May, a rating with which we wholeheartedly concur. The high recording levels and quiet surfaces give a stunning dynamic, which is most impressive. The acoustic is surprisingly coherent for a large orchestral recording, and any 'spotlight' microphones have been used with unusual taste and discretion (excepting perhaps the inevitable 'flying triangle'). C. B. pointed out the 'extraneous thumps . . . coming from the conductor's rostrum'; these are indeed evident and some may find this aspect irritating.

Tchaikovsky's *Pathétique* Symphony (No. 6) played by the LSO under Loris Tjeknavorian was double-starred by C. B. in March. The RCA recording (LPL1 5129, *not* 5128 as quoted in the review) certainly has a fine sound, with

notable depth within the orchestra and a lack of any obvious spotlighting or dragging forward of instruments. There is a full but well articulated bass (very impressive bass drum in the March, on big speakers), and brilliant but not overbright brass and upper strings. Hafler adds a useful quota of ambience without anomaly. However, Side 1 seems to be cut at a decibel or so lower than Side 2, and on our QM sample the disc was a trifle ticky in places. Also, the famous fortissimo chord which introduces the development section in the first movement had a distorted 'splurge' pre-echo. For these reasons we feel that the rating should be qualified to **A*/A**, but it is still an excellent issue.

C. E. gave a star in April to James Galway and Michael Debost playing Telemann's Op. 2 Flute Duets (HMV HQS1368). While agreeing that this is an outstanding record, repeated playing has made us aware of a slight ambiguity in the image of the two flutes. They are certainly not too close-miked; the sound is beautifully free from key and breath noises, but the instruments seem to be in a studio created ambience rather than a real one. A very minor criticism, however: a matter of personal taste rather than technique, and much more noticeable when Hafler speakers are turned off. Certainly no reason to downgrade, so rating confirmed.

In March J. A. awarded a qualified star (**A*/A**) to Philips' latest Vivaldi *Four Seasons* (9500 100), with Felix Ayo, the Berlin CO and Vittorio Negri. The qualification concerned

to p. 87

-tails you win

take a chance, kick off with a Dual

C919

Hi-Fi - Stereo 4 track deck for recording and playback. Incorporates Dolby* noise reduction system. Memory counter. Line and mike mixing. Headphone volume controls. Output level controls etc.



There are only two cassette decks that can match the superb precision you have come to expect from DUAL Turntables. They are the DUAL Models C901 and C919. Our cassette decks combine the very latest in electronic technology with innovation, making for superior recording and replay.

All DUAL equipment surpasses the requirements of DIN 45.500 for HI FI home/studio equipment.

Which one will you choose? We think it's a toss up.

All DUAL HI FI products are backed by a full after sales service

*Dolby is a registered trade mark of Dolby Laboratories Incorporated.



Visit your dealer and be a winner

Enquiries to:

A. C. FARNELL LIMITED
Kenyon Street, SHEFFIELD S1 4BD
Telephone No. 0742 78901

In Northern Ireland DUAL is represented on our behalf by Walton and Gordon Audio Limited, 38a Queen Street, Belfast 1, Telephone Belfast 20656

The building of a new Castle

Determined to enhance their now-established reputation as specialist makers of high-calibre loudspeakers, Castle have just built another.

It's called the Kendal.

They started with a 30mm treble unit (low-mass diaphragm with integral driving coil). And added a very special 20cm bass/midrange unit, designed to match the 30-litre cabinet.

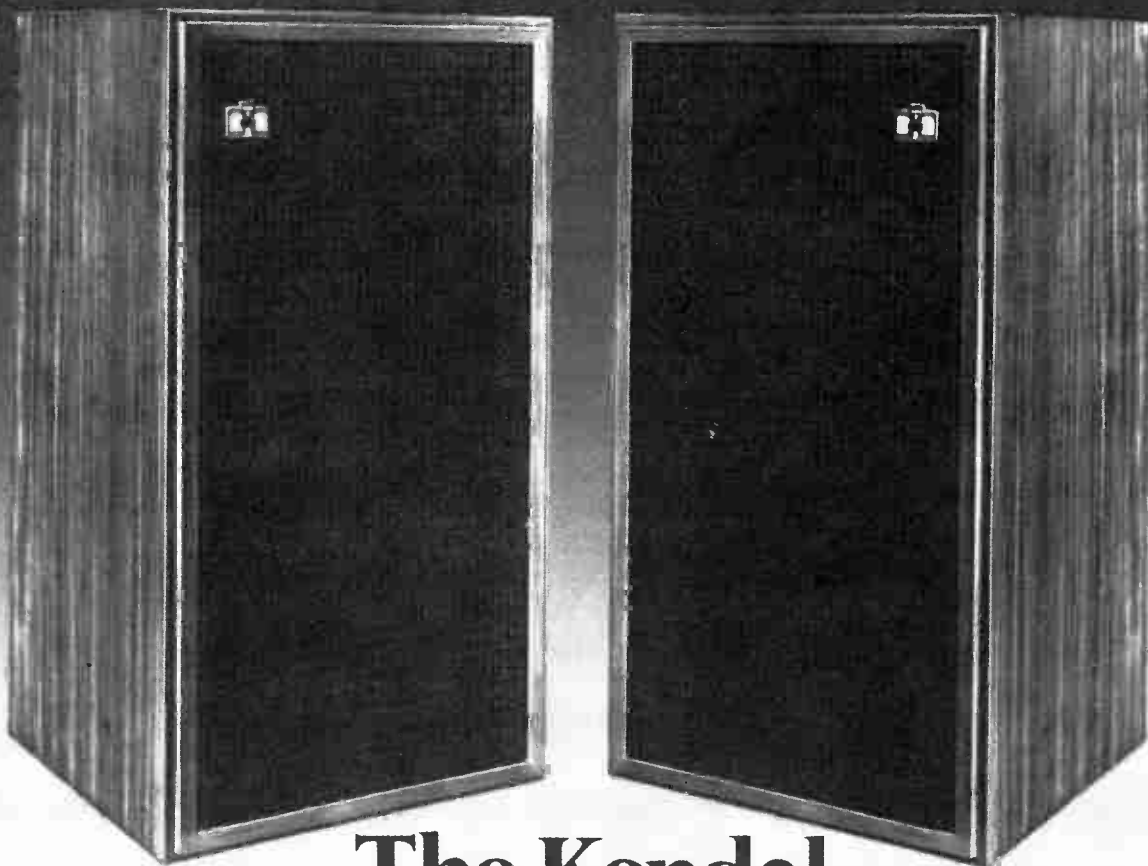
Like other Castle systems the Kendal is efficient and would not need high power amplifiers for home listening. This performance is achieved by careful attention to detail from

design to manufacture. By making our own speakers and cabinets a realistic price is ensured.

The sound quality compares favourably with many loudspeakers requiring two or three times the driving power.

The result is a loudspeaker of exceptional performance . . . also one of exceptional beauty, finished by hand in selected veneers. Walnut, teak and mahogany are standard, with other finishes available to special order.

If you are a connoisseur of hi-fidelity sound and high-quality furniture, please send today for a leaflet and stockist list.



The Kendal

Castle 
Acoustics Limited

Now post this coupon for the name of your nearest Castle dealer.

NAME _____

ADDRESS _____

HFS8

Shortbank Road, Skipton, Yorks. Tel: Skipton 5333

Letters...

... about a new ambience dimension

From: Allan Fletcher, 62 Moorbridge Lane, Stapleford, Nottingham NG9 8GU

Dear Sir, I note with especial interest some remarks about simulated delayed ambience in your May issue (pp. 67/69), because I have recently imported the Audio Pulse unit referred to and, as you say, it may be rather expensive (total cost £510) but for those enthusiasts who can afford it I would unhesitatingly recommend it. All who have heard it have been very impressed by the results; it really does add a new dimension to stereo.

I am also set up for SQ, QS and CD-4, and in my opinion the ambience unit does provide a more satisfactory and realistic impression than any of the quadraphonic systems. The performers are in the right place, in front, and unless one is used to sitting in the middle of the orchestra this is far more natural.

Yours faithfully

Note: We plan to report on the Audio Pulse soon—Ed.

... about the real brass

From: E. J. James, 10 Leighwood House, Leigh Woods, Bristol BS8 3PQ

Dear Sir, Like Mr Hytch (May, p. 73) I read the March article on amplifier musicality with a certain degree of amazement. In fact my first reaction was to turn to the date, but no, it was not April 1, nor was there any mention of past musical performances stored in the molecular structure of old music stands (April 1976 issue). You really have shattered a long held belief that the reproduction of sound should lose as little of the original as possible, and add as little as possible to the original. I suppose we must admit, however, that if an amplifier is going to add harmonics, a set of nice harmonics is preferable to a set of nasty ones.

I am reminded strongly of an experience of almost fifty years ago, which, despite the lapse of time, remains very vivid. There were no hi-fi shows in those days, but each September in the late 20s and early 30s I used to cycle the 120 miles from Bristol to spend a couple of days at the Radio Show. Bed and breakfast cost 3s. 6d. per night (17½p for your young readers), and then I would cycle back to Bristol with a heavy load of pamphlets and leaflets for my winter's reading. There were no demonstration rooms, but every stand did its best to show that it could produce louder sounds than any of its near neighbours.

On this particular occasion they were all using a BBC broadcast of a military band, and I went from Stand A (Listen to the Pure Sound—which meant nothing below 250 Hz) to Stand B (Never Mind the Music, Listen to the Bass), etc. Suddenly I was stopped in my tracks by the most ghastly din. I turned to find the source, so that it could be put upon my black list of things not to buy, then stood with mouth agape, certainly looking like

Bertie Wooster at one of his less intelligent moments. There, on a platform raised above the stands was the band itself which was being broadcast. There was a rough edge and a shrillness to the sound which no purist could bear, and the distortion seemed intolerable. So I hurried on to the mellow sounds of Stand C, resolved never to buy a military band. Mr Hytch is quite right—the real thing does *not* always sound pleasant.

Yours faithfully

... about mistracking discrepancies

From: Douglas A. G. Crammond, 90 Brookside Road, London NW11 9NG

Dear Sir, I was very interested in the article by Jean Hiraga on *Pickup Musicality* in your April issue. In particular, I would make the following comments.

Bearing in mind the maximum velocities which can be tracked correctly by present state-of-the-art cartridges, I would expect that 50 mV is a reasonable theoretical maximum output if no mistracking occurs. Thus the reported discrepancies in peak outputs of cartridges may be a function of how well they track high level signals. If these differences are mainly a function of linearity, I would expect this to show up on a harmonic distortion test using a sine-wave cut at, say, a peak velocity of 30 cm/sec.

I would suspect that mistracking is a more likely cause of the discrepancies, particularly if the tests were carried out without RIAA equalisation.

Yours faithfully

... about microphones and instruments

From: Georgina Dobrée, A.R.A.M., 19 Chantry Street, London N1 8NR.

Dear Sir, I am rather puzzled by two remarks made by your reviewer Peter Turner in the May issue.

Firstly, in his review of the Coleridge-Taylor Clarinet Quintet and the Kreisler String Quartet (page 120) he writes about 'elaborate miking' and 'complicated set-ups' used by Bob Auger Associates for the recording. I can assure you that only two mikes were used throughout, for both works, and once the desired balance was achieved nothing was touched and no gimmicks used by the performers either.

Secondly, in his review of the Molter Clarinet Concertos (page 127) he appears to equate the 'thinner and more flute-like' sound with the use of an 'early type' of instrument. I have never pretended to play early clarinets (and do not do so here), and while flattered to think the performances sound authentic, a flute-like sound is in fact the natural quality of the D Clarinet for which these concertos were written. I can claim no credit for that.

I did not feel I could let these points pass without comment.

Yours faithfully

Peter Turner comments:

In the absence of *information* about recording techniques, the reviewer can only trust his own ears, playing his own equipment in his own room. If, then, the effect be of a hard-working engineer playing his own tunes on his sliders, that is all the reviewer can

report. I followed my usual practice of listening to the record before reading anything about it beyond the barest details, but Mr Auger stated flatly in a broadcast discussion that he always tries for what I call a larger-than-life sound, and also argued against the coincident microphone pair. I thus received confirmation of what my ears had already suggested to me. It seems that I was wrong about the technique used, though I remain unrepentant about the quality of the sound produced.

On the other point, Miss Dobrée is being too modest. What I intended to imply was that, in my opinion, her tonal approach to the work in hand was precisely right. But if we could be told of any variations in the instruments used for a particular recording, it would be very helpful.

... about Ambisonics, quadraphony and 'J'

From: Professor P. B. Fellgett, Department of Engineering and Cybernetics, University of Reading, 3 Earley Gate, Whiteknights, Reading RG6 2AL

Dear Sir, The heading to Rodney Tietjen's May article *Decoding BBC Matrix H* is slightly misleading in its reference to Ambisonics in a couple of aspects which it may be helpful to elucidate.

The first is that the recommended encoding specification is designated 45J, in which the J is a serial designation having no reference to the *j* of complex number theory. The two-channel encoding, which is part of the set of 45J specifications, is designated 45JB.

Secondly, although the description in the article itself is quite correct, the heading says that a modification will enable the '45j matrix to be decoded accurately according to Vario-matrix principles'. Now, I know how to add, subtract, multiply or divide matrices, and how to calculate the transpose, trace or inverse of a matrix, but 'decoding' a matrix is beyond me. Clearly what is meant is that 45JB-encoded signals can be decoded in this way.

This is not just a matter of words, but illustrates a fundamental distinction. A 'matrix quadraphonic' system assumes that the starting point is four signals, and that encoding is done by feeding these to a matrix circuit which generates the encoded channel-signals. Unfortunately, as is now known, only some kinds of encoding can be generated from the usually assumed source-signals in this way, and the best encodings cannot be realised by this method. The more modern approach is to say how *direction* is to be encoded in the channel signals, without making any arbitrary restriction. This leads to what are called kernel encodings, and the 45J specifications are of this kind.

To put it in a commonsense way, surround reproduction is not essentially about 'four channels' or even four signals or four loudspeakers. Its starting point is all possible directions from which sound may arrive, and its aim is to give the listener the illusion of sound reaching him from all possible directions. Loco designations like 4-2-4 are not therefore really appropriate; a system using *n* channels would more properly have to be

The musical ambassadors

We get letters from music lovers on both sides of the Atlantic. Here are some of the flattering—and surprisingly similar—things they say about B&W DM Speakers:

☛ I didn't hear [the] speakers, I heard the music ☛

USA

☛ Get people to listen to your stuff and it will sell itself ☛

UK

☛ There's no other speaker in the world I would rather have ☛

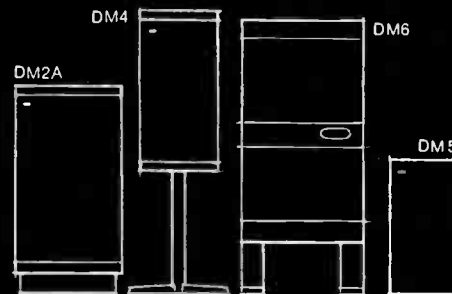
USA

☛ The more I listen, the more convinced I am that I made a sound investment, and I look forward to a decade or so of good listening ☛

UK

☛ Mr. Bowers, they are truly incredible ☛

USA



Get along to your B&W appointed dealer soon and hear the DM range for yourself. Or drop a line to us and we'll send you detailed literature.



B&W Loudspeakers

B & W Loudspeakers Ltd (Room 2) Meadow Road Worthing West Sussex BN11 2RX Tel. (0903) 205611

B & W DM is the registered trade mark of B & W Loudspeakers Ltd

Tape Matters Douglas Brown

THE German amateur recording club is organising a weekend in September to teach interested members the theory and practice of *under-water* tape recording!

That is something for the specialists, but we are at the time of year when I should remind readers once again of the value of personal recordings made on holiday or when following leisure-time activities. Everyone, these days, goes on holiday with a camera in his luggage. Although the number grows each summer, I imagine that only a minority take along a cassette recorder.

I have made holiday recordings all over the world, as well as taking colour photos, and I am quite clear that the best of recordings is more evocative and more satisfying than the best of photographs. When I listen to the surf beating on a Pacific coast, or the whistle of a locomotive on the approach to Moscow, or the excited argument of the car-rozza drivers in Naples, these sounds coming from my tapes stimulate a whole train of memories, whereas my colour transparencies remind me only of one particular scene. It is rather like the radio play which so excites the imagination that it is far more effective than a poor television version.

You do not have to go all the way with my argument. Just try it this summer. That cassette deck is not *only* for listening to music.

IF YOUR HOBBY is bird-watching or the study of animals, you can give direction to your recording efforts by making a tape, or tapes, for the Scotch Wildlife Sound Recording Contest. Details of this year's event are now available from the Public Relations Department at 3M UK Ltd, 380-384 Harrow Road, London W9 2HU, and the closing date for entries is October 28. And a last-minute reminder for entrants in the 1977 British Amateur Tape Recording Contest. Closing date for entries is June 30.

While on the subject of contests, winner of this year's Tape-Slide Competition for the Leslie Guest Trophy was High Wycombe and District Camera Club. Their entry, a model of its kind, consisted of 51 colour transparencies taken in and around Wells Cathedral, with appropriate music recorded in the Cathedral.

BASF United Kingdom are now offering a free lecture service to tape recording, photographic and cine clubs, and other suitable organisations. The lecture includes a history of tape recording, illustrated with films and slides. Applications should go to the Publicity Officer, BASF United Kingdom Ltd, Haddon House, 2-4 Fitzroy Street, London P 5WIAD.

I AM WRITING before the AGM of the Federation of British Tape Recordists at Brighton, but I am in a unique position to report one event before it actually occurs! At the meeting John Bradley was elected to follow me as President of the Federation.

For almost exactly 20 years I have been closely associated with the Federation, and its embryonic predecessor club. While it has not achieved any significant membership increase in recent years, it is a firmly established, well organised and widely experienced group of enthusiasts, able to give real help to newcomers to the hobby.

John Bradley has been closely associated with it for many years, too. I remember first meeting him when he had taken a prize in an early British Amateur Tape Recording Contest. For many years now he has been the secretary of that Contest, and no one has done more to sustain interest in this premier competitive event of the recording year.

Recently, John has thrown himself with undiminished enthusiasm into the world of talking newspapers for the blind and disabled, and he and his equally enthusiastic wife, Peggy, are playing an important part in spreading this activity nationwide.

A link between the Federation and this wider recording activity with a social purpose will be of real value all round.

Letters

called an infinity-*n*-infinity system in this notation, since there are an infinity of possible sound directions and an infinity of possible sensations of direction in the listener.

It is particularly important not to think of surround reproduction as necessarily limited to just four loudspeakers, and certainly not always in a square. It is expensive enough to have four speakers, but there will always be those who think the benefit of using more loudspeakers worthwhile, and the systems should allow for this expansion in the future. More immediately, a decoder having an adjustment that permits the loudspeakers to be put in any rectangular arrangement, not just a square, can save much domestic difficulty.

Yours faithfully

... about binaural sound and quadraphony

From: John E. White, 36 Manscombe Road, Livermead, Torquay, TQ2 6SX
Dear Sir, So yet another quadraphonic system is to be tried out on the public, this time by the BBC. Will this system get off the ground? Why have all the other systems failed to really interest the public?

I would suggest two reasons. Firstly, that the average home-owner, and not only the womenfolk, is not prepared to tolerate the proliferation of more hi-fi hardware. Secondly, I would suggest that in spite of all the arithmetic and trigonometry, three- or four-speaker systems will never work. Stereo does

not really work in the first place. I say this for the simple reason that the brain will never accept as realistic the idea of reproducing the sound matrix of, say, Pebble Mill, Festival Hall, or the Albert Hall in the living room.

Many thousands of people who have a stereo capability already have the finest of all quadraphonic systems yet devised. All these good people now need is a private line to the best seat in the concert hall. I am referring to binaural sound, of course.

As readers will have seen in your May issue, Angus McKenzie was very impressed by some BBC tapes of binaural sound. Public reaction to the BBC programme *Oil Rig* has indicated that there is already a great deal of interest, and I hope that this will increase—if possible before another quadraphonic system is laid to rest.

I do realise that there is a stereo compatibility problem here; but binaural sound is so simple that a start could be made right away during off-peak hours. 'Live' wherever possible, of course.

Yours faithfully

Quality Monitor

balance between strings and continuo, and the rating appears to be well-founded. This is very much a recording in the modern idiom, yet one of the best of this type. The combined colorations and coherence of the recording environment have been sacrificed somewhat, but the clarity and instrumental tone are superb. This tends to give a some-

what pasteurised sound, but does not severely detract from the enjoyment of the recording, which can be warmly recommended, not the least for the impeccable pressing quality on the QM sample.

More Vivaldi, and yet more to follow! But sorry V. M., we can't quite agree with your star in May for the Op. 10 Flute Concertos (played on recorder) from Jean-Claude Malgoire and his players on CBS 76595. The recorder and the harpsichord are, we feel, a little too forward at times, especially in some of the slower movements, giving a superficial impression that the strings (four violins, viola, cello and bass) are a little timid. A better balance was achieved on the same set of concertos (with a one keyed flute and single violins) by the Academy of Ancient Music on Argo (April p.149). Down to A therefore, but there are certainly some starred moments, the *largo e cantabile* in the F major Concerto (No. 5) being a case in point, where the balance between strings, recorder and a lute continuo is exemplary.

G. J. gave a star in April to the 3-disc album of Vivaldi's twelve Op. 8 concertos (including the *Four Seasons* again) from I Solisti Veneti on Erato STU70680. While agreeing wholeheartedly with his comments on the marvellous ambience, close perspective and perfect balance, we do feel that this recording, in common with the other Vivaldi/Scimone/Erato releases in April, has a certain artificiality about it—ambience courtesy of an echo-plate, that sort of thing. But this is an excellent recording nevertheless, and rating confirmed.

The Dust Bug[®]

First marketed in 1954 no better design has yet been evolved although the principle has been copied by dozens of manufacturers. The only cleaner with hand tipped nylon bristle shaped to fit the groove and rigid enough to penetrate to the groove bottom without damage; a super mohair plush pad for collecting the debris.

Now features new model pedestal permitting temporary and/or permanent fixing. Height instantly altered with locking device. Totally British made. Backed by 22 years reputation.

Recommended Retail Price £1.94

Replacement parts:

Bristle & Plush Pad 16p per set
Antistatic Dispenser 21 p each
Pedestal 36p each
All prices include V.A.T.



Cecil E. Watts Ltd., Darby House,
Sunbury-on-Thames, Middlesex.

Please send me _____ Dust Bugs at £1.94 inc. V.A.T.
(Please add 15p each for postage & packing, U.K. only)

Replacement parts as follows — _____

(Please add 11p per item for postage & packing, U.K. only)

I enclose cheque/P.O. value £ _____

(Do not send postage stamps)

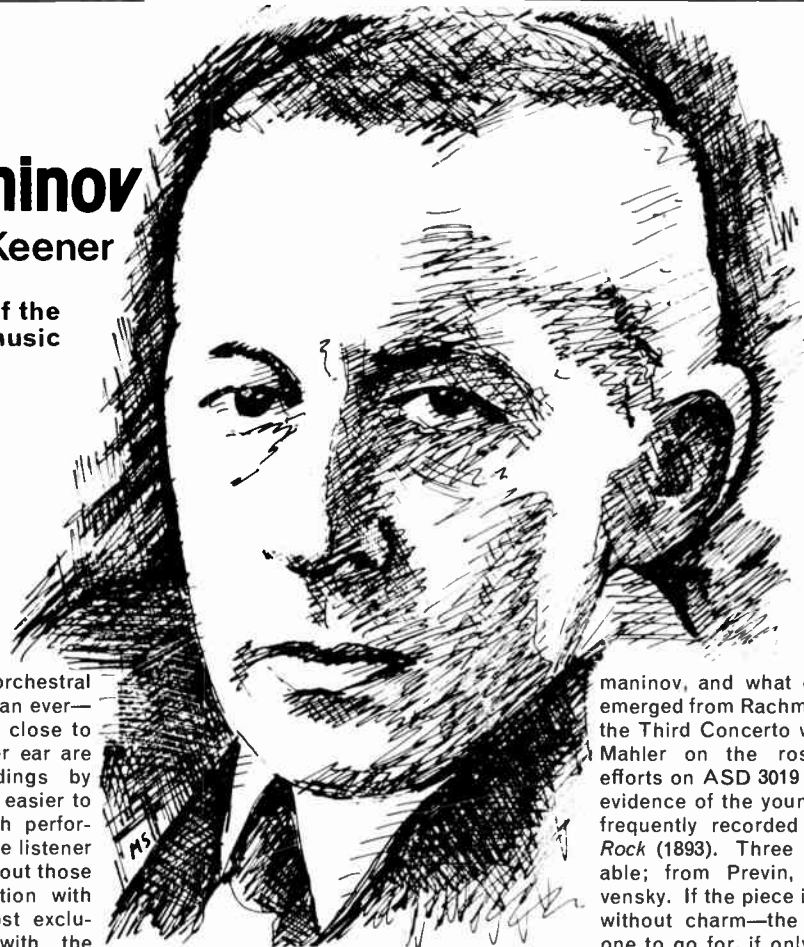
Name _____

Address _____

Rachmaninov

Andrew D. Keener

One man's view of the
orchestral music



LISTENING to the Rachmaninov orchestral discography—more extensive than ever—poses an intriguing question: how close to the sounds in Rachmaninov's inner ear are the supposedly authentic recordings by Russian orchestras? It is arguably easier to apply the word 'authentic' to such performances of, say, Tchaikovsky, but the listener to Rachmaninov cannot reckon without those 'Fabulous Philadelphians', a tradition with which Rachmaninov became almost exclusively involved. Unfortunately, with the current unavailability of Ormandy's CBS discs of the symphonies, we are left with an incomplete opportunity to assess the unshakability of the Philadelphia tradition. Little justice is done to it in Ormandy's latest (and uncut) account of the Second Symphony, although matters are hardly helped by the rather nondescript RCA recording which seems to remove any glow that may have surrounded the musicmaking for these sessions. Hardly a contender now that it has moved out of the bargain basement. Previn's HMV disc is one to treasure; apart from the fact that nowadays he offers the score complete (as do most sensible people) the ebb and flow of the interpretation are most compelling. The structure of the piece holds together far more convincingly than in Previn's earlier, cut, attempt for RCA, finally disproving the contention that cuts in this symphony tighten up the structure. Superb recording, offering a perfect balance in such places as the unison cor anglais, violins and violas at the recapitulation of (i). Weller also shows himself completely at home in this symphony. Orchestral textures are a little less sumptuous and more detailed: the trumpet's rapid triplets in the coda of the Finale (presented at a fair lick) have never sounded so incisive. First-rate playing from the LPO throughout this clean, refreshing reading. Kletzki (Suisse Romande), the first complete account to appear, is not in the same class orchestrally as the others, or even as his disc

of no. 3 with the same orchestra. If there are any poor souls left who still dismiss Rachmaninov's coherent symphonic layout as empty rhapsodising, let them rest content with one of the hacked-about versions: Boult (Eclipse), now dim-sounding, or Stevlanov (boxed) on HMV Melodiya. Better to spend a mere £1.25 on Loughran's splendid and complete account on CFP.

What of these Russian recordings, then? HMV have put us in their debt with their Melodiya link-up, which has produced recordings of a great part of Rachmaninov's output. These are big-boned, thrusting performances that are nothing if not uninhibited, and the results are frequently highly exciting; if only the suspicion outlined above was not so persistent. In several cases the works represented are otherwise unavailable, including an impressive disc of early pieces on ASD 3019. The orchestral sound is instantly recognisable as Eastern European: horns that strike some as positively saxophonic in their use of vibrato, a cutting trombone sound and a string timbre that evokes vivid images of resined hair on gut. The early Symphonic Poem *Prince Rostislav* (1891), with its haunted glissandi on harp, displays a composer already fully aware of what orchestration is all about, and in the macabre trumpet/trombone chording the sound-world of *The Isle of the Dead*, eighteen years later, is never far away. What a fixation these other-worldly issues held for Rach-

maninov, and what dark sounds must have emerged from Rachmaninov's performance of the Third Concerto with the death-obsessed Mahler on the rostrum. These teenage efforts on ASD 3019 often provide more vivid evidence of the young genius than the more frequently recorded orchestral fantasy *The Rock* (1893). Three performances are available; from Previn, Weller and Rozhdestvensky. If the piece is required—and it is not without charm—the Previn is probably the one to go for, if only because it is the least expensive and shares a superb coupling. The Russian disc of early pieces is, however, an essential for Rachmaninov students, especially as the Melodiya recording is smoother than many from this source.

Smooth sound-quality is not always a hallmark of the Russian recordings, however. The ill-balanced, carelessly-edited and raucous-sounding Third Symphony in the boxed set SLS 847 spoils a fascinating reading (hear the Allegro section of the slow movement for typical highly-charged Russian virtuosity), although the wobbly solo horn at the outset of the slow movement is unacceptable, to my Western ears at any rate. None of the other performances in this box suffers as badly from poor sound and the First Symphony is a mighty experience, as unsailable as a hurricane in the brilliant passages, making Previn and Weller sound tame by comparison (development of first movement; coda of last). If this symphony is to make any impact—and it certainly can—it must have the full-blooded treatment of the kind it receives from Svetlanov. A bargain, then, especially with a dark-hued *Isle of the Dead* and a brilliant account of the *Symphonic Dances* thrown in along with *The Bells*, the Three Russian Folksongs and *The Rock*.

Previn's account of the *Isle of the Dead* and the *Symphonic Dances* is predictably sympathetic; one of his best Rachmaninov discs, in fact, with the ghostly string writing in the second dance sensitively realised. If the

Is your cartridge ready for the last waltz?

If your records are beginning to sound as if they're on their last legs it could be because your cartridge needs replacing. But with so many to choose from and with each making different claims, it's hard to know which one to pick.

So at this point it's worth remembering one particular factor.

Namely, that the most accurate reproduction comes from lowering the effective mass of the moving parts of the cartridge. This allows the stylus to easily accelerate and decelerate in order to follow the complex modulations of the record groove.

Or, to put it another way, the smaller and lighter the cartridge, the better the reproduction.

And ADC cartridges are about $\frac{2}{3}$ the size and weight of other magnetic cartridges. This is largely due to our exclusive *Induced Magnet* system which replaces the heavy conventional moving magnets with a tiny feather-light armature, to produce better

reproduction, less distortion and superior tracking capability.

It also means that high frequency resonance can be damped electromagnetically; consistently and without introducing distortion.

The ADC QLM32 Mk2 cartridge is designed for medium to high quality semi automatic and manual turntables capable of accepting a pickup which tracks between 1 to 2 grams.

At £14.27 (inc VAT) it will make every waltz sound like the first waltz.

ADC QLM32 Mk2 SPECIFICATIONS

Output at 5.5cms/sec 5mV

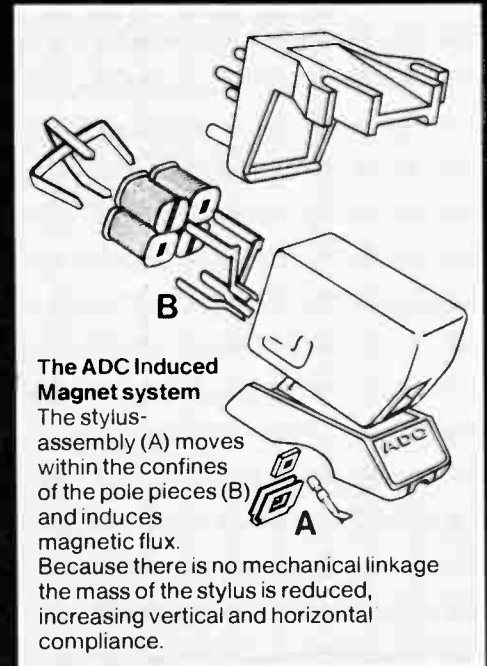
Tracking force range 1 to 2 grams

Frequency response 15Hz to 20kHz \pm 3dB

Channel separation (nominal) 24dB

Stylus tip Elliptical .0007" x .0003"

Distributed by BSR Limited,
Powke Lane, Cradley Heath, Warley,
West Midlands B64 5QH.



ADC QLM32 MK2



MUSIC ON RECORD

Russian performance swirls more menacingly here, this is offset by the separate availability of the excellent mid-priced Ormandy in which the Philadelphia strings are at their most voluptuous in a perfectly acceptable recording complete on a single side. Steer clear of Ansermet's thin and precarious *Isle of the Dead* on Eclipse, however. If RCA would reissue Rachmaninov's recording on a single disc, this would sweep the board—1929 sound or not.

Before leaving the symphonies, two bargains must not be left out: Rachmaninov's own recording (1939) of no. 3 (complete with the characteristically rich and supple strings, at their most telling in the harmonics at the end of movt. 1), and Previn's account for RCA. EMI's probable remake will have to be quite something to improve upon this rich, trenchant reading. Good 1967 sound. Stokowski's slack reading with an orchestra of first-class London players is a disappointment. It sounds under-rehearsed and interpretatively unmotivated with an indistinct acoustic to match. Hardly a tribute to one of the great conductors of the Philadelphia tradition. The filler, *Vocalise*, in its orchestral version (Stokowski has also recorded the vocal arrangement) is beautifully done; the lovely melodic line is seamlessly spun, although this hardly alters the verdict on the whole disc. Rachmaninov's own performance (albeit part of a box) is the one to go for, with Johanos on Turnabout offering a serviceable coupling with the *Symphonic Dances*.

The prospective concerto purchaser is faced with a bewildering array of recordings. There is a fine boxed set from Ashkenazy, and although Anievas' set has now been deleted, the former is not always to be preferred to the latter. No less than three performances of the Third Concerto by Ashkenazy are currently available, the latest of which is undoubtedly the finest; for once the florid 'build-up' on the RCA sleeve rings true. The first-movement cadenza is torrential, and if life exists on this planet in a hundred year's time, people will still be listening to this recording in wide-eyed astonishment. Closely-balanced piano, recessed horns (contrast Ashkenazy/Previn), but who cares?

A mere step down from this exalted com-

pany are Mogilevsky on Concert Classics Melodiya and Janis on Universo (to be preferred, I think, to his performance on RCA Camden—how well these old Mercury soundtracks still sound). Pure magic in Janis' opening to the Finale. Horowitz's record with Reiner, with cuts, is a favourite of some, while others (myself among them) find it all a little fraught. When are we to have van Cliburn's wonderful concert performance back?

As far as no. 2 is concerned, if Richter (DG) is too emphatic (I dissent from this view) and the orchestral contribution too anaemic, Ashkenazy's earlier disc with Kondrashin offers extraordinary power and commitment. The coupling with Previn is more generous—a superb no. 1—and more skilfully balanced, but a shade less urgent in approach. To be avoided at all costs is the incredibly dim Richter account on Ember. Whether or not the performance that emerges through the fog of this Russian recording is a fine one beats me. Rubinstein (with Ormandy) naturally offers some superb piano playing and musicianship even if the results do not endear themselves to everybody: how he spins the solo line in the central section of the slow movement! But this, of all concertos, faces intense competition, and the engineers of this RCA disc allow the Philadelphia tone-quality little look-in with frequently recessed sound. Katin (coupled, like Ashkenazy/Previn, with no. 1) is thoughtful but dully recorded—buy his disc for arguably the most coherent no. 1 on offer. Amid such stiff competition Vasary's recent disc yields rather too many points of ensemble and balance to be top-rated, although if his recent 'Lively Arts' *Paganini Rhapsody* is any guide, the forthcoming disc is one to wait for. How wise DG are in keeping Richter in the catalogue, even if one could wish for a more well-upholstered orchestral sound. The filler—six preludes—reminds one of what a complete recording from Richter might sound like, and how fruitless it seems to continue pestering the companies for it.

Julius Katchen's Ace of Diamonds disc of the Rhapsody is exciting, but too often the excitement seems to stem from the experience of a superb technician at the height of his considerable powers. Ashkenazy is far more

musical here, or, if Katchen's Dohnanyi coupling appeals, Cristina Ortiz's good-natured record is a well-recorded alternative: which brings us to the Fourth concerto and Michelangeli. This elusive master pianist almost convinces that this is worthy Rachmaninov, and the recording (1958) might have been made last year. It has long been proven useless to haul this shadowy figure into the recording studios with any frequency. His notorious unreliability with engagements and insistent (unrealistic?) demands for an instrument of his own specification and standards remain very much a part of a faintly-sketched image. One must merely be thankful that such recordings as this exist. A similar feeling goes with the boxed set of concertos with Rachmaninov as soloist. Here, as in his record of the Third Symphony and Ormandy's deleted CBS symphony discs, one can believe in the Philadelphia tradition, so glorious is the string sound, emerging unscathed through faded sound. The Rhapsody was completed in a single evening (Christmas Eve 1934) and the result is bright-eyed, crisp and sonorous, with only a little distortion in the more passionate moments to distract the attention. What a pianist Rachmaninov was; nobody has quite matched the aristocratic style of playing in nos. 2 and 3, although the latter, viciously cut, displays Rachmaninov's insecurity concerning this whole issue. The odd little excision—cautiously bracketed in the score—in the first movement of his recording of the Third Symphony surely does nothing for the musical sense; as far as I know, Sargent in an early '50s disc last available on MFP was the only other conductor to carry out this curious practice on record. Whether or not the cuts in the composer's disc of the Third Concerto were dictated by the 78 rpm side lengths is still open to argument. An indispensable set, however, with only the Fourth Concerto (made when the composer was 68 and two years away from death) betraying any sign of weakness in his keyboard technique. And what a sound Rachmaninov's favourite orchestra made...

'When I compose, my thoughts turn to you, the Philadelphia, the greatest orchestra in the world'. ●

RECOMMENDED RECORDINGS

Symphony nos. 1-3; The Rock; The Isle of the Dead; The Bells; Three Russian Folksongs; Symphonic Dances
Various artists & orchestras/Svetlanov, Rozhdestvensky, Kondrashin
HMV Melodiya SLS 847(5) [B/C: 1/2].

The Bells/Vocalise
LSO/Previn HMV ASD 3284 [A*: 1]

Symphony no. 1 in D minor
LSO/Previn HMV ASD 3137 [A/A*: 1*]

Symphony no. 2 in E minor
LSO/Previn HMV ASD 2889 [A: 1/1*]
LPO/Weller Decca SXL 6623 [A: 1].

Symphony no. 3 in A minor
LSO/Previn RCA LSB 4090 [A: 1] with *The Rock*
Philadelphia/Rachmaninov RCA AVM-3 0295(3) [H: 1*/1] with *Isle of the Dead, Vocalise* and violin sonatas with Kreisler.

Piano Concertos 1-4
Ashkenazy/LSO/Previn Decca SXLF 6565/7 [A: 1/2]
Rachmaninov/Philadelphia/Stokowski, Ormandy RCA AVM-3 0296 [H: 1/1*].

Piano Concerto nos. 1 & 2
Katin/LPO/Boult Decca SPA 169
Katin/NSO/Davis [B: 1; B/C: 1/2].
Ashkenazy/LSO/Previn Decca SXL 6554 [A: 1; A: 1/2].

Piano Concerto no. 2
Richter/Warsaw PO/Wislocki DG 138076 [B: 1/1*] with 6 Preludes

Ashkenazy/Moscow PO/Kondrashin Decca SXL 6099 [A/B: 1] with *Etudes-Tableaux* 10, 11 & 14.

Piano Concerto no. 3
Ashkenazy/Philadelphia/Ormandy RCA ARL-1 1324 [B/C: 1*]
Janis/LSO/Dorati Philips 'Universo' 6582 006 [B: 1]
Mogilevsky/Moscow PO/Kondrashin HMV 'Melodiya' Concert Classics SXLP 30218 [B/C: 1].

Piano Concerto no. 4
Michelangeli/Philharmonia/Gracis HMV Concert Classics SXLP 30169 [A: 1*] (with Ravel G major concerto)

M Ashkenazy/LSO/Previn Decca SXL 6556 (with Paganini Rhapsody)
[A: 1].

Rhapsody on a theme of Paganini
Ashkenazy/LSO/Previn (see above)
Ortiz/NPO/Koizumi HMV ASD 3197 (with Dohnanyi Vars.) [A: 1].

The Isle of the Dead; Symphonic Dances
LSO/Previn HMV ASD 3259 [A: 1].

Symphonic Dances
Philadelphia/Ormandy CBS Classics 61347 (Hindemith: Mathis) [B: 1].

Scherzo for Orchestra
Symphonic Poem: Prince Rostislav
Aleko: Excerpts
USSR SO/Svetlanov HMV Melodiya ASD 3019 [A/B: 1].



What you hear now will be the truth.

The 3050 speakers from the new Leak 3000 Series: 3020, 3030, 3050, 3080.

World Radio History

There are four significant kinds of distortion in speakers. Using a unique simulation technique we have been able to reduce all four to remarkable new levels.

The result is the Leak 3000 series.

The technical details of this achievement cover twenty-five pages of close type and graphs. And as many years of experience.

Simply, we built a test device to generate these distortions. (If you're interested, they're *intermodulation, delayed resonance, Doppler, and time delay.*)

Each type was measured objectively, and our speaker specifications amended.

And then the results were measured not only by machines, but also by panels of listeners.

Ordinary men and women, some with highly trained ears, others more used to listening to transistor radios.

Their experience of hearing distortion was measured. And the design specifications again amended.

These measurement techniques are unique. As are their results. Our tests show that to audio engineers and untrained listeners alike, we have attained new standards of accuracy.

Each type of distortion has been reduced, one by one. Even the minor, but audible: *time delay.*

In conventional speaker cabinets, the sources of sound are at different distances from the listener.

With the precision-designed stepped baffle of the new Leak series, the bass driver is in exactly the same plane as the treble.

The progressive reduction of every audible distortion means that you will hear a dramatic difference. Greater depth, spatial effect and transparency of sound.

You will not listen to Leak speakers, but *through* them, directly to the music.

They achieve a new truth in sound reproduction.



A.T. Labs (Dept.N)

Monday-Saturday 10.00-18.00

Tel.

191 Chase Side, Enfield, Middlesex EN2 0QZ 01-363 7981

AMPLIFIERS		Technics stocked		Empire 2000Z		Akai GXC760D	
Accuphase	(Carr. £3-00)	Trio KR2600	P.O.A.	JVC XI	P.O.A.	JVC I740B	£395-00
Armstrong 621	P.O.A.	Trio KR3600	£169-00	JVC Z1	P.O.A.	JVC KD21	P.O.A.
JVC JA-511	P.O.A.	Trio KR4600	£215-00	Micro Acoustics 2002E	P.O.A.	Nakamichi 550	P.O.A.
JVC JA5-31	P.O.A.	Yamaha CR200E	P.O.A.	Ortofon VM520E	£29-75	Nakamichi 600	P.O.A.
Leak 3900A	£279-00	Yamaha CR620	P.O.A.	Ortofon M15E Super	£49-00	Nakamichi 700	P.O.A.
Lescon	P.O.A.	Yamaha CR820	P.O.A.	Ortofon SL20E	£51-25	Nakamichi 1000	P.O.A.
Lux L30	P.O.A.	Yamaha CR1000 and 1020	P.O.A.	Ortofon MC20	£58-95	Pioneer 2121	£135-00
Lux L80	P.O.A.			Shure M75-65	£7-25	Rotel RD10F	£112-50
Lux L80V	P.O.A.			Shure M75ED/II	£15-00	Rotel RD20	£155-00
Nakamichi 610	P.O.A.	MUSIC CENTRES		Shure M75EJ/III	£12-75	Rotel RD12F	£155-00
Nakamichi 620	P.O.A.	Aiwa AF5050	P.O.A.	Shure M95ED	£19-00	Tandberg TCD310 II	P.O.A.
N.A.D. 60/90	P.O.A.	Aiwa AF5080	P.O.A.	Shure M95EJ	£13-00	Teac A360 (Special offer)	£189-00
Rogers A75/II	P.O.A.	Rotel RM5010	£349-00	Shure M75B/II	£10-25	Technics stocked	P.O.A.
Rotel RA212	£56-00	Yamaha MS2B	P.O.A.	Shure V15/III	£44-25	Trio KX520	£129-50
Rotel RA312	£66-00	TURNTABLES (Carr. £3-25)		Shure M24H	£29-50	Trio KX620	£155-00
Rotel RA412	£85-00	ADC Accutrac 4000	£257-50	Stanton	P.O.A.	Yamaha TC800GL and TC800D	P.O.A.
Rotel RA712	£103-50	Connoisseur BD1 Kit	£15-50	Ultimo 10A/20A/20B	P.O.A.	Yamaha TC5115	P.O.A.
Rotel RA812	£148-00	Connoisseur BD2 chassis	£34-75	TAPE DECKS (Carr. £3-00)		SPEAKERS (pairs) (Carr. £3-00 pair)	
Rotel RA913	£159-50	Connoisseur BD2 complete	£46-00	Akai 4000DB	£195-50	AR range	P.O.A.
Rotel RA1312	£265-25	Connoisseur BD2a complete	£52-00	Akai 4000DS/II	£141-75	Celestion Ditton 11	P.O.A.
Rotel RA1412	£347-00	Fons CQ30	P.O.A.	Akai GX 2150	£251-50	Celestion Ditton 15	P.O.A.
Setton range	P.O.A.	JVC JLA15	P.O.A.	Revox 1102/4	P.O.A.	Celestion Ditton 22	P.O.A.
Sugden range	P.O.A.	Monitor Audio ET1000	P.O.A.			Celestion Ditton 33	P.O.A.
Technics stocked	P.O.A.					Celestion Ditton 44	P.O.A.
Trio KA1500	£69-95					Celestion Ditton 66	P.O.A.
Trio KA3500	£109-50					Celestion UL6	P.O.A.
Yamaha CA410	P.O.A.					Celestion UL8	P.O.A.
Yamaha CA610	P.O.A.					Celestion UL10	P.O.A.
Yamaha CA800/II and CA810	P.O.A.					Chartwell	P.O.A.
Yamaha CA1000/II and CA1010	P.O.A.					Hi-Fi Aids Orbital Brackets	P.O.A.
TUNERS (Carr. £2-75)						IMF Compact II	P.O.A.
Armstrong 623	P.O.A.	Pioneer PL112D	£55-00	Revox Dolby and High Speed	P.O.A.	IMF Super Compact	P.O.A.
Armstrong 624	P.O.A.	Pioneer PL115D	£70-00	Tandberg 3500X	P.O.A.	IMF T1580/II	P.O.A.
Lux T33	P.O.A.	Pioneer RP900	£59-00	Teac	P.O.A.	JR Loudspeakers JR149	P.O.A.
Lux T88V	P.O.A.	Rotel RP3000+Arm	£114-25	HEADPHONES (Carr. 75p)		KEF Corelli	P.O.A.
Lux T110	P.O.A.	Rotel RP3300	£73-00	AKG K140	£16-50	KEF Calinda	P.O.A.
Rogers T75/II	P.O.A.	Rotel RP5300	£95-50	AKG K160	£22-00	KEF Cantata	P.O.A.
Rotel RT224	£61-50	Technics stocked	P.O.A.	AKG K240	£31-50	KEF 104/AB	P.O.A.
Rotel RT324	£78-00	Thorens TD126/BC	£179-00	Beyer DT 440	£22-50	KEF 103	P.O.A.
Rotel RT724	£93-00	Thorens TD126C	£225-00	Koss PROSLC	P.O.A.	Leak 3020	£94-95
Rotel RT824	£146-00	Thorens TD145C/III	£116-00	Koss HV1A	P.O.A.	Leak 3030	£124-95
Sugden range	P.O.A.	Thorens TD160B/C/II	£80-00	Koss HV1LC	P.O.A.	Leak 3050	£172-95
Technics stocked	P.O.A.	Thorens TD160C/II	£98-00	Koss PRO4AA	P.O.A.	Leak 3080	£264-95
Trio KT5300	£89-95	Thorens TD166C/II	£85-50	Koss HV2	P.O.A.	Monitor Audio MA1/II	P.O.A.
Yamaha CT410	P.O.A.	Reference Hydraulic	P.O.A.	Micro MX1	P.O.A.	Monitor Audio MA3/II	P.O.A.
Yamaha CT610	P.O.A.	Reference Electronic	P.O.A.	PWB Moving Coil	£17-00	Monitor Audio MA4	P.O.A.
Yamaha CT800 and 810	P.O.A.	Reference Stylus Brush	£3-75	PWB Dyna-X	£19-75	Monitor Audio MA5/II	P.O.A.
Yamaha CT7000 and 1010	P.O.A.	Reference Sweep Arm	£6-00	Sennheiser HD400	£12-25	Monitor Audio MA7	P.O.A.
TUNER AMPLIFIERS (Carr. £3-25)		Trio KD1033	£54-50	Sennheiser HD414X	£17-75	Monitor Audio MA8	P.O.A.
Aiwa	P.O.A.	Yamaha YP211	P.O.A.	Sennheiser HD424X	£25-50	Rogers Compact Monitor	P.O.A.
Akai AA 1020	P.O.A.	Yamaha YP511	P.O.A.	Sennheiser HD224	£39-00	Rogers LS3/5A	P.O.A.
Akai AA 1030	P.O.A.	TRANSCRIPTION ARMS (Carr. 75p)		Stax	P.O.A.	Rogers Exp. Mon.	P.O.A.
Armstrong 625	P.O.A.	GST.I Lustre	£28-50	Videotone HP80	£11-50	Videotone Minimax II	£47-50
Armstrong 626	P.O.A.	Colston MC101	£22-50	Yamaha HPI	P.O.A.	Wharfedale Chevin XP	£29-75
JVC JRS 100	P.O.A.	Formular 4 II	P.O.A.	Yamaha HP2	P.O.A.	Wharfedale Denton 2XP	£44-25
JVC JRS 200L	P.O.A.	Hadcock G.H. 228	P.O.A.	Yamaha HP3	P.O.A.	Wharfedale Linton 3XP	£64-25
Leak 3200	£169-25	SME 3009 Improved	£41-00	CASSETTE DECKS (Carr. £2-75)		Wharfedale Glendale 3XP	£88-50
Leak 3400	£212-00	SME 3009/S2 Improved	£45-00	Aiwa	P.O.A.	Wharfedale Dovedale 3SP	£152-50
Lux Range	P.O.A.	Reference Fluid	£35-00	Akai CS34D	£98-50	Yamaha NS500M	P.O.A.
N.A.D. 140/160	P.O.A.	CARTRIDGES (Carr. 25p)		Akai CS702D	£94-00	Yamaha NS1000M	P.O.A.
Rotel RX152/III	£93-00	ADC QLM 30	£10-75	Akai CS705D	£132-00	SPEAKER KITS AND CHASSIS	
Rotel RX202/III	£106-50	ADC QLM 32	£14-25	Akai CS707D	£164-50	(Carr.: Kits £1-50 ea.; 5p Chass £1-25 ea)	
Rotel RX402	£141-50	ADC QLM 36	£18-00	Akai GX310D	£137-00	KEF T27	£9-25
Rotel RX603	£204-50	ADC XLM II	£27-50	Akai GX310D	£164-50	KEF B110	£11-95
Rotel RX803	£256-00	ADC VLM II	£22-25	Akai GX370D	£212-00	KEF B200	£13-25
Setton range	P.O.A.	ADC Super XLM	£39-00	Akai GX325D	£249-00	KEF B139	£28-25
Tandberg TR2055	P.O.A.	AKG TS Series	P.O.A.	Akai GX370D	£315-00	KEF DN12	£8-00
Tandberg 2075	P.O.A.	Empire 2000E/III	P.O.A.	Akai GXCS70D	£405-00	KEF DN13-SP1015	£5-50

All prices listed include VAT at 12½%

We have tried to ensure prices are correct at time of going to press (E & OE)—however prices are liable to alteration without notice

Terms of Business

Callers:

By Bus: 231 from Turnpike Lane Tube. 107 from Oakwood.
By Train: Liverpool Street to Enfield Station. Kings Cross to Gordon Hill.
Cheques for counter sales accepted only when backed by a bank card. Access/Barclaycard.

By Post

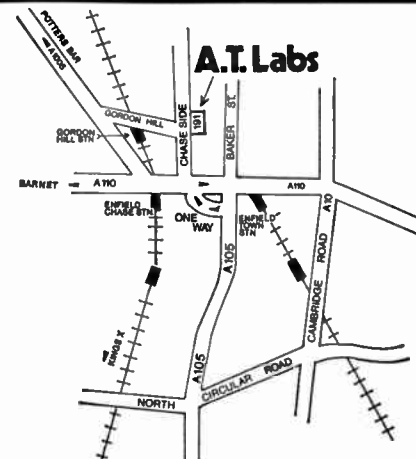
Send Cheque/Postal Orders with written order and correct carriage for prompt service. Make cheques payable to: A. T. Labs.

Credit

For Personal callers only. Phone for details. Export Facilities for reclaiming VAT available.

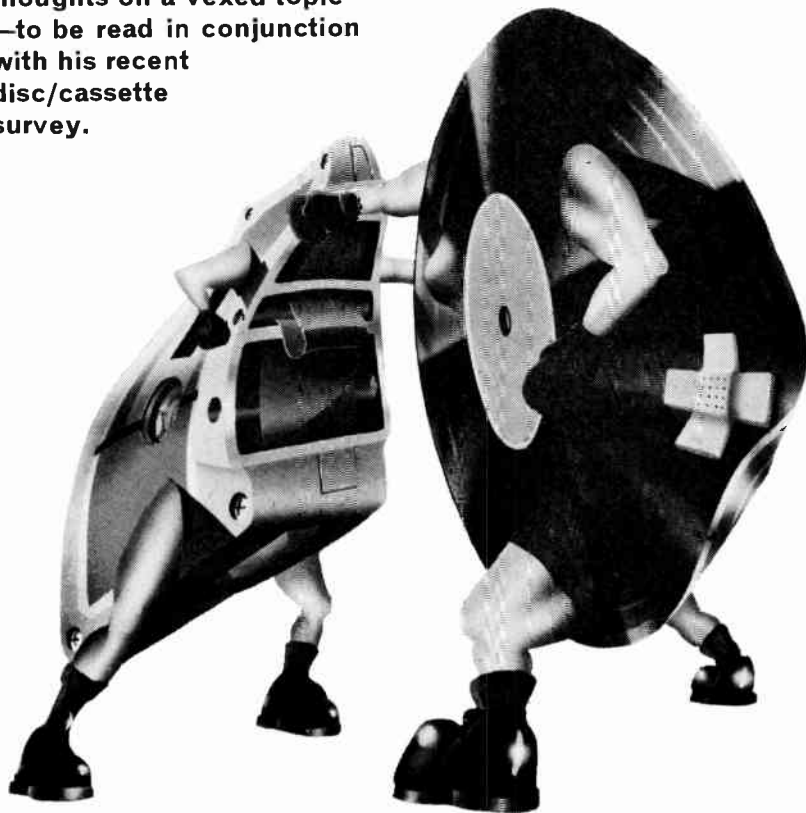
Service

Repairs and maintenance of Hi-Fi equipment by qualified engineers.



RECORDED BALANCE

Angus McKenzie offers some thoughts on a vexed topic —to be read in conjunction with his recent disc/cassette survey.



THE philosophy of sound balance is a very complex matter, and pressures on space precluded its discussion in the survey of discs and cassettes printed in the last two issues. However, some of the more subjective judgements proffered in that survey arose from aspects of balance rather than from problems of disc or cassette manufacture, so here are a few notes which should help to clarify my position on this controversial subject.

The sound balance adopted in music recordings or transmissions may arise from two alternative attitudes or aims. The first is to reproduce a sound approximating to that heard in the most appropriate concert hall, while the second is to recreate totally the sound with an acoustic that is artificial but exciting, bringing the music itself over the loudspeakers rather than a specific performance of the music.

Many will say that this is over-simplification, but usually one finds that a recorded sound tends to go one way or the other, although a few attempt to take a middle

course. Philips and Polydor recordings, although usually multi-miked, seem generally to be more natural and give me more enjoyment than Decca ones, a fact perhaps explained by Decca's use of their famous 'Christmas-tree' microphone configuration, which usually incorporates a mixture of omni-directional and cardioid mikes. I suggest that their frequent use of omni-mikes introduces phase anomalies at low frequencies, while their occasionally rather recessed mid-frequencies could arise from the 'forward' impact of the speakers employed for monitoring. However, high frequencies seem to come over very clearly. Decca's basic engineering is nearly always of a very high standard, but their balance philosophy may possibly need some reappraisal.

EMI have frequently been superb, and in particular the musicality of their earliest stereo recordings was magnificent. But their adoption of SQ compatible encoding seems to me to have caused a general cloudiness of sound, with artificial instrument positioning that I find a little tiring;

but at their best EMI records are excellent. The reproduced quality seemed to vary from one recording to another in our survey, but they did submit some good basic recordings. I wish they could be encouraged to use fewer microphones, as in the past, though.

I am afraid that I am personally biased against CBS's philosophy, and so to be fair to them I must add that there will obviously be many readers who like their type of sound, which is much admired in the USA. There has also been a tendency in recent years for their European-based recordings to become slightly less aggressive and more natural. Philips seem to record the best string tone and their sound balance always seemed much smoother than that from the other companies, but this comment must be taken as a generalization. Despite my high opinion of DG recordings, I feel that often the actual sound seems too coloured at mid frequencies by the acoustic environment. I remember some time ago comparing the DG Karajan recording of Dvorak's *New World* against EMI's Karajan one, the latter not only being recorded some years earlier, but with a much clearer stereo sound and less coloration than any of the *New Worlds* in the survey.

I cannot help but feel that balancers seem to be attempting to justify the amazingly complex facilities at their disposal, for the BBC consistently produce an average sound from relayed concerts that is much more natural and pleasurable than the majority of commercially recorded sounds. The BBC usually achieve this with comparatively few microphones.

Engineers have repeatedly told me that they have to use many mikes so that they can correct an orchestral balancing problem at a moment's notice. With some trepidation, I suggest that a simpler mike technique should almost always be preferred, and it should be the job of the conductor and orchestra to get their own internal balance correct in the first place. Some of the best records, given the most consistently good reviews, have been made with simpler microphone techniques, whereas many of the 16-track master recordings of classical music have produced grotesque interpretations of what was intended originally by the composer.

Suffice it to say that exceptions prove rules, and many multi-miked stereo recordings are magnificent, while some coincident stereo recordings of chamber music have been disastrous, when insufficient care has been taken to place the stereo microphone correctly. It would be a very boring world if all balance engineers agreed exactly about balance, and I expect many readers will disagree strongly with some of the points that I have raised, but I trust that as many, or more, will back up my love of a natural sound balance. Try listening to the reverberation as well as the direct sound, and note the clarity of positioning of all the instruments. In particular, try to judge the perspective, and question whether it is right or wrong. Most important of all, go to as many live concerts as you can, and compare the thrill of a real performance with the sound of some of your favourite recordings when you get home. ●



The Great Names are on HMV CRISTINA ORTIZ

A stunning new record of Prokofiev's own piano
transcriptions of highlights from his ballets
CINDERELLA and ROMEO & JULIET

* HQS1395 stereo/quadrasonic (available mid-July)



CRISTINA ORTIZ plays PROKOFIEV



Other recent recordings by Cristina Ortiz, include:
RACHMANINOV Rhapsody on a Theme of Paganini
DOHNANYI Variations on a Nursery Song
New Philharmonia Orchestra/Kahuziro Koizumi
ASD3197 *stereo/quadrasonic

SHOSTAKOVITCH

Piano Concertos 1 & 2; Three Fantastic Dances
Bournemouth Symphony Orchestra/Paavo Berglund
ASD3081 *

BRAZILIAN SOUL – Music by Villa-Lobos,
Vianna, Miguez, Guarnieri, Fernandez HQS1339

MUSIC FOR CHILDREN

including Debussy's Children's Corner,
Prokofiev's Old Grandmother's Tales,
Mompou's Scènes d'Enfants,
Ibert's Histoires and music by Khachaturian
HQS1364 stereo/quadrasonic

Cristina Ortiz is piano soloist in
Lambert's The Rio Grande, coupled with Walton's Symphony No. 2,
Portsmouth Point and Scapino Overtures,
conducted by André Previn on ASD2990*

*also available on tape cassette

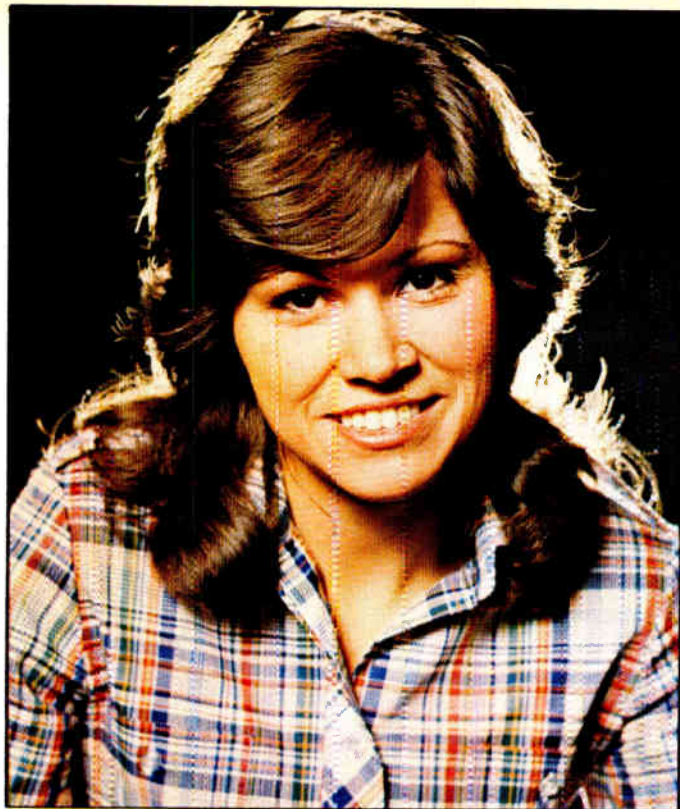
EMI Records Ltd., 20 Manchester Square, London W1A 1ES
A member of the EMI Group of Companies, International leaders in Music Electronics and Leisure.



Cristina Ortiz

Just before last Christmas a charming record of piano music with childhood connections appeared (HMV HQS1364), including Ibert's *Histoires* and of course Debussy's *Children's Corner*, and delighted normally hard-hearted critics. The artist was 26-year-old Cristina Ortiz, a very talented pianist as well as a charming lady. HFN/RR met Cristina at her West London home soon after a lunch-time concert she gave at the Bishopsgate Hall; how did the recital go? we asked. 'Well, very well... I played Schumann's *Car-naval* and two works by Villa-Lobos... it was nice to have a break in the middle of the day.' The mention of Villa-Lobos made us wonder if it was just coincidence that Cristina's recordings so far have reflected her Brazilian nationality. As well as an album called 'Brazilian Soul' she has recorded Lambert's *Rio Grande* with André Previn and the LSO. 'Well yes, and I recently recorded the Poulenc Piano Concerto with Fremaux and the CBSO [HMV ASD 3299, which was awarded a 'special' MTA award in April], which has a *maxixe* (tango) rhythm, but I think it just happened that way. I hope that I'm not going to get a label as a Brazilian specialist, although it is in my blood of course. I have just recorded some Spanish pieces by Albeniz, Granados, etc, which go very well with my temperament... and I'm supposed to be also doing a French record soon.'

Cristina Ortiz: Photograph by Bob Martin



Gramophile

and he says "Yes, don't worry". The Prokofiev recording was the first time that I was sure at the sessions that it had gone all right.'

Cristina is very happy with the sound of EMI records. 'Yes, we have a nice team; John Willan used to be Christopher Bishop's assistant and I was one of the first artists that he was assigned to produce... we have a very constructive relationship. We always record at Abbey Road with the same two engineers, whom I like very much because they know how to get the piano sound I like.'

Cristina had a change of style in April, and recorded some chamber music. 'Yes, it was a piano quintet with the young Medici Quartet. This is the first time I've recorded chamber music and it came about because John Willan is also the Medici's producer. EMI just put the two of us together.' Cristina has three strings to her bow: recitals, chamber music and orchestral. Which does she prefer? 'It is very hard to say which I prefer: I love all music. I love doing chamber music for my own immediate pleasure, but it is very hard to find the time. I used to have a very

good cellist friend, Tom Igloi, who used to come round almost every week. We were friends ever since the chamber music Festival in Marlboro [when she worked with Rudolph Serkin in the States] but he has since unfortunately died. Of course I had more time then, I had only just started my career... I was living in this tiny house in Chiswick then, it was very cramped with a concert grand and a baby grand in our eleven by eleven living room. Now I've got the space I don't have the time, but I am going to try to do more now that I'm working with the quartet. I really don't see enough of my home... I get torn apart because I very much enjoy looking after my house and my plants—I enjoy being a woman as well as a musician.'

The week after we met, Cristina was once more going into the studio to record some Villa-Lobos with the New Philharmonia. 'There will be the *Ma-me Precoce* Fantasy on one side and the *Bachianas Brasileiras* No. 3 on the other, but I don't know when it will be released. The conductor will surprise you, it's Ashkenazy, and it's very exciting to be working with

him.' It must have some benefits, a pianist being conducted by a pianist? 'Yes, he is fantastic. I have worked with him before in the same way, doing the Rachmaninov *Paganini Variations*—he is very sympathetic to the soloist. It is amazing to hear him not only when accompanying, but conducting a work such as the *Manfred* symphony. You can hear exactly how he would have played the piece—you hear all the details of his playing and personality in the orchestra... you recognise it immediately as Ashkenazy.'

Cristina is devoted to French music and it is not surprising; after winning the Sixth National Piano competition in Rio de Janeiro in 1965, she studied with Magda Tagliaferro in Paris for three years before becoming the youngest (and only female) winner of the Van Cliburn competition in 1969. 'Magda got me into French music through her teaching, and from that into Russian—Rachmaninov, Scriabin and Prokofiev are among my all-time favourites. Don't write that I don't like Beethoven, I'm crazy about him, but it just happens that the public are more ready to accept young people when they record showpieces. It is one of my dreams, among many, to be able to say that I just want to play a Mozart concerto... because Mozart is just about the most satisfying music there is. It has to be played very easily... some people try to pull it about too much, or they over-play it—you just have to let the music speak. Your playing is also very exposed so you have to be completely relaxed and confident—if you're not, forget it! That's why you have to get to a certain level and be accepted by the public before you can show them that you can play Mozart. Beethoven as well, except that Beethoven is, what do you say, more stern, which fits in very well with my temperament—I used to be a tomboy, I had five brothers and had to fight my way through them as I grew up.'

Cristina is now very much a part of the international piano scene, with successful tours in the USA, Japan and New Zealand as well as Europe, and made her debut last June with the Concertgebouw, playing the Copland Concerto in the Holland Festival. I'm playing a lot of Beethoven in Holland and I'm pleased that my Beethoven is being accepted—they say that my Beethoven speaks in a different way. I don't know, I just play it. I am a very instinctive person, I don't think that every note should be thought about—it should come mostly by instinct and doesn't then sound forced.'

VAC-O-REC

The clean machine



Next time you play your favourite music, listen very carefully. You'll hear some very unpleasant sounds. Because, hidden inside every record there are microscopic dust particles. Like scouring powder they will grind into the grooves, wear away your sensitive stylus and gradually ruin your enjoyment. And up 'til now, there's been very little you could do about it... most liquid cleaners and cloths only scratch the surface, they don't get deep down to the problem.

But, where conventional cleaners fail, Vac o Rec succeeds. Vac o Rec is an entirely new concept in record care. We call it our 'album saver'. Here's how it works... Take any record EP, LP or 78 and slot it into your Vac o Rec. Very gently the record will start to revolve as three separate cleaning operations go to work on the micro-grooves. Soft mohair brushes will reach deep down to dislodge and lift the dirt particles. This grime is then sucked well away from the record surface by a powerful built-in vacuum cleaner. And, whilst Vac o Rec is cleaning up, special 'mylar strips' sweep the record surface to reduce static electricity and so prevent further build-up of fluff.

No other cleaner takes such care of your record collection. And you don't have to take our word for it - listen for yourself. Only Vac o Rec can give you back the sounds you love.

Available now from all good record and music stores.

vac o rec

YOU CAN HEAR THE DIFFERENCE

VOR INTERNATIONAL
Randles Road, Knowsley Industrial Estate
Knowsley, Merseyside

monitor sound

- All Prices Inclusive of VAT at 12½%
- One Year Free Parts and Labour
- Excellent Demonstration Facilities

AMPLIFIERS		TUNERS	
Pioneer SAS300	£59.90	Pioneer TXS300	£69.90
Pioneer SA6300	£76.50	Pioneer TX7500	£137.50
Pioneer SA7300	£117.95	Pioneer TX9500	£198.00
Pioneer SA7500	£172.50	Rotel RT224	£56.00
Rotel RA212	£57.00	Rotel RT324	£80.00
Rotel RA312	£67.50	Rotel RT724	£95.00
Rotel RA412	£87.50	Armstrong	P.O.A.
Rotel RA712	£101.00	Trio	P.O.A.
Armstrong	P.O.A.	Quad	P.O.A.
Quad	P.O.A.	Sony	P.O.A.
Trio	P.O.A.	Yamaha	P.O.A.
Yamaha	P.O.A.	Technics	P.O.A.
Technics	P.O.A.	Sansui	P.O.A.
Sansui	P.O.A.	CASSETTE/TAPE	
RECEIVERS		Pioneer CTF2121	£133.50
Leak 3200	£159.95	Pioneer CTF6060	£176.00
Leak 3400	£198.50	Pioneer CTF7070	£190.00
Goodmans	P.O.A.	Pioneer CTF8080	£247.00
Rotel RX152 Mk II	£87.95	Pioneer CTF9191	£291.00
Rotel RX202 Mk II	£104.00	Akai CS34D	£85.00
Rotel RX402	£145.00	Akai GXC39D	£130.00
Rotel RX702	£172.00	Akai CS705D	£125.00
Pioneer SX450	£117.00	Akai GXC710D	£182.50
Pioneer SX550	£144.00	Akai 4000DS	£145.00
Pioneer SX650	£211.00	Akai 4000DB	£200.00
Akai	P.O.A.	Nakamichi 600	£299.00
Armstrong	P.O.A.	Sony	P.O.A.
Trio	P.O.A.	Tandberg	P.O.A.
Tandberg	P.O.A.	Aiwa	P.O.A.
Sony	P.O.A.	Trio	P.O.A.
Yamaha	P.O.A.	Yamaha	P.O.A.
Aiwa	P.O.A.	Technics	P.O.A.
Bang and Olufsen	P.O.A.	Bang and Olufsen	P.O.A.
Sansui	P.O.A.	Sansui	P.O.A.
TURNTABLES		SPEAKERS (Pair)	
Garrard		Leak 3020	£82.00
SP25 Mk IV Mod + Cart.	£37.00	Leak 3030	£108.00
865B Mod + Cart.	£59.00	Leak 3050	£155.00
1255B Mod + Cart.	£49.90	Celestion Ditton 15	£92.90
DD75 Mod + Cart.	£86.50	Celestion Ditton 22	£121.00
GT55 Mod + Cart.	£80.00	Celestion Ditton 33	£144.90
Rotel RP1500 inc. Arm	£67.50	Celestion Ditton 44	£169.00
Rotel RP3000 inc. Arm	£108.00	Celestion UL range	P.O.A.
Pioneer PL112D	£55.95	Wharfedale Chevin	£28.50
Pioneer PL115D	£69.95	Wharfedale Denton 2XP	£42.00
Pioneer PL510A	£108.00	Wharfedale Linton 3XP	£59.95
SME 3009ND Arm	£39.95	Wharfedale Glendale 3XP	£89.95
Shure M75ED Cart.	£15.50	Wharfedale Dovedale SP	£139.50
Shure M75EJ Cart.	£13.00	AR	P.O.A.
Shure M95EJ Cart.	£13.50	IMF	P.O.A.
Shure M95ED Cart.	£19.50	B & W	P.O.A.
Shure V15 Mk 3 Cart.	£43.00	Quad	P.O.A.
Goldring G900E Cart.	£28.95	Monitor Audio	P.O.A.
Sony, Fons, Technics, Yamaha, B & O, Dual, Sansui	P.O.A.	Castle Acoustics	P.O.A.
HEADPHONES/CARTRIDGES		Videotone	P.O.A.
Koss, Pioneer, Sony, Shure, Mordaunt-Short	P.O.A.	Spendor	P.O.A.
Stanton, Goldring, Senheiser, Yamaha, B & O	P.O.A.	Bang and Olufsen	P.O.A.
		KEF	P.O.A.

CASSETTES—CASSETTES

	Five	Ten	Twenty
BASF LH C90	£4.18	£8.00	£15.30
BASF Super C60 (5m)	£4.60	£8.80	£16.90
BASF Super C90 (5m)	£6.00	£11.50	£22.10
TDK SD C90	£5.20	£10.00	£19.15
TDK SA C90	£7.85	£15.10	£28.80
Maxell UDC90	£6.70	£12.90	£24.80
Memorex C90	£5.30	£10.14	£19.40
Sony HF C90	£5.30	£10.30	£19.60

S.A.E. FOR CASSETTE AND TAPE PRICES
Postage 25p per five
PRICES CORRECT AT TIME OF GOING TO PRESS

monitor sound

TEL 71935

64 chapel st. chorley, lancashire.

Philip Jones

1977 is of course the Royal Silver Jubilee year, but 1976 was the silver jubilee year for both Argo Records and the Philip Jones Brass Ensemble, who both celebrated 25 years of existence last November. Their eighth album for Argo, 'Divertimento', is released this month, and features several of them as soloists, and includes André Previn's *Four Outings* for brass quintet.

Philip Jones himself has been combining the position of leading the PJBE with being head of the Wind and Percussion Department of the Royal Northern College of Music for a while, but has now returned to being a fulltime musician. Why was that, we asked? 'Apart from the strain of having to more or less commute to Manchester for the job, I have found that I still enjoy playing very much, although I had previously thought my performing days were over. We seem to be getting more and more in demand for live concerts and it would be a shame to stop this activity when there is still a lot to do. I find when I'm not playing, I really miss something—I still enjoy very much the activity of having to go to a concert and having to do it there and then. In an academic job you still have to do it but you do it roughly in your own time and often on your own terms—performing is not that simple and once it gets in your blood, it's difficult to get it out.' Why did you decide to start up a brass ensemble, an almost revolutionary idea in the early fifties? 'Well, I had done the whole orchestral scene for many years and in an orchestra you are a very limited chap musically . . . you sit around most of the time enjoying everybody else's lovely music making and add a comment every now and again. Of course it's good, it's a great discipline, no question about that, to play the right notes at the right time takes a great deal of control, but you are not playing a lot of music; I was listening to a lot of music but not playing much . . . and so not having any ability whatsoever to become a soloist, the only alternative was to form the group. I have no interest at all in the solo trumpet repertoire—it sounds marvellous for a short time but its range of expression is too limited.' And yet it's so good in jazz. 'Fabulous, now you're talking . . . it's a superb instrument in jazz. One of the greatest sadnesses for me is that I had no jazz training at all; when I began playing, you were either a straight player or another, and the straight player was the one who counted.

So I didn't learn anything at college about extemporising or about jazz chord sequences, or anything, and what a gap that has left. The Americans have the right idea: mostly everyone can turn on an idea of a style other than classical; it might be a bit corny of course, in terms of a real jazz player, but it *would* have something?'

The PJBE repertoire seems to concentrate on early music and 20th century music with nothing in the middle. 'Actually, there is very little genuine early repertoire—Gabrieli, for instance, would have written for cornetts and trombones (sackbuts) rather than trumpets. The music does lend itself well to brass, of course, if played with taste and with regard to the way people actually played—it's crazy to blast out on modern instruments when the earlier instruments were so much quieter. The music does work well on modern instruments when you have an idea of the scale of what you are playing. All through the classical period, however, as the primitive brass instruments were made chromatic, they went to the symphony orchestra; composers wrote grand stuff in the orchestras for them rather than small scale brassworks. OK, you can say that neither did Gabrieli in the 16th century, why don't you use the 18th and 19th century for cooking as I call it, or arranging? It doesn't work very well, that's why; it doesn't sound effective because the composers wrote with specific tone colours in mind. The 20th century is OK, then you are playing the instruments in their own right with music that is written for them by composers who understand the instruments and want to write for that combination.'

'We do get a lot of unimaginative music sent to us out of the air and it's a pity that people who have got the imagination to write for small group brass are thin on the ground. It seems that so many don't understand what can be done with a brass quintet, I mean they want them to play all the time which is so dreary. And then there's two standard things if you are writing for brass: (a) you write fanfares, preferably in fourths if you want to sound modern; and (b) you write chorales, oh and fugues of course, someone will always put a fugue in. That doesn't add up to anything at all; not using the instruments for what they can do, but just repeating old stereotypes. The best modern pieces are from pretty established composers. The sad thing is that I could never get any of the older generation of composers to write

for us; I would have loved a piece from Benjamin Britten. I knew him quite well and occasionally used to egg him on . . . but he never actually got round to writing anything. Tippett's eyes would light up with a twinkle when I'd say, "what about a piece, Michael?" and he would be interested, but didn't get started either.



Philip Jones

A pity because the Sonata for Four horns is a magnificent piece of writing, imaginative beyond belief—think what he could do with a quintet.'

How did the Previn piece happen? 'André was in charge of the 1975 South Bank Music Festival, and I asked him if he would write a piece for a concert we were doing. The result was the *Four Outings* which is really a very good piece, stimulating with a lot to be got out of it. I've known him as a composer for a bit and reckoned that he would take very well to the brass thing although, as far as I knew, he had not written a brass piece before. He is a very good all round musician—I know a lot of people like to run him down . . . but I must say that a chap who one minute can stand up and conduct a symphony orchestra, the next sit down with Oscar Peterson and play good jazz piano, and then sit down and write a piece for a brass ensemble off the cuff, is a good musician, full stop (!) and I wish we had more of them. So what if people are a little disturbed at seeing him a lot on television, the Previn's of this world are helping to destroy this idea that classical music is stuffy and not meant to be enjoyed.'

Philip Jones is doing a lot to widen interest in music for brass ensemble through his connection with Chester Music, a large amount of the PJBE repertoire now being published for the first

time, and would very much like to see more brass groups appearing. 'Yes, I want to see younger groups coming along, groups who play more modern music than we do, youngsters who understand that idiom better because they've been brought up in it; we've had to acquire that knowledge, they should have it automatically. There is such a lot to do, we have just shown the way and created a market, and it is absolutely necessary that more ensembles appear so that they can consolidate our work.'

Happy Birthday

Abbey Records celebrated their tenth birthday in May with a buffet at the Royal Festival Hall, at which the large number of guests were entertained by a distinguished roster of Abbey artists. These included the Dolmetsch Quartet, Jill Gomez, Andrew Wicks (Head Chorister of Chichester Cathedral), the boys of Worcester Cathedral choir and a clutch of celebrated organists and pianists who acted as accompanists. It was an enjoyable occasion, with the company's distinguished history outlined by its founder Harry Mudd. At the same time Abbey released a batch of five brand new issues to mark the occasion, some of which are reviewed in this issue.

'We don't read you, Mission Control . . .'

RCA have announced that they are having to withdraw Isao Tomita's recording of the Holst 'Planets', enthusiastically reviewed by J. A. in June, because of legal action taken by Imogen Holst, daughter of the composer. This applies to the UK only, so, if you've got a copy, hold on to it, because it will otherwise be unavailable, presumably until 1984 when Holst's music passes into the public domain. It's a pity, though, especially as it follows reasonably soon after the withdrawal of the *Carlos Pomp and Circumstance*. Surely a transcription carried out with integrity and respect shouldn't offend?

Clothes maketh the Charts

Marie Osmond was in London on May 23 'to boost her wardrobe of clothes' for a forthcoming TV series. Wow! Hey, fantastic! Great! Faar Out!!

Oh, there's a record as well. Now what was it? Sorry, forgotten.

How we managed to reduce the cost of the 626 by £34.



Armstrong 626 AM-FM Stereo Receiver.



Armstrong 625 FM Stereo Receiver.

For some people, AM radio is essential listening and as far as this ad. is concerned they may as well turn off now. (Or better still, go immediately to the coupon and send for details of the Armstrong 626 AM/FM Receiver or the 623 AM/FM tuner!)

But the fact is that, for many, AM on a receiver is an unused facility - and hence, an unnecessary expense.

And that's why in Series 600 you'll find a receiver *exactly* like the 626. With the exception of an AM tuner section.

And .£34 knocked off the price!

It's called the 625 and it's a beautiful bargain in every respect:

An amplifier delivering over 40 watts per channel, both channels driven, with less than 0.08% distortion.

And an FM tuner designed to achieve a specification very close to the theoretical performance limits of the FM broadcasting system.

(Send for our brochure before . . . and you won't be sorry after.)

Please send me the Armstrong Series 600 12-page colour brochure, press review booklet and list of franchised dealers.

Name

Address

Post to: Armstrong Audio Ltd., Warlters Rd., London N7 0RZ. Tel: 01-607 3213.

7HFN77

Armstrong

Armstrong Series 600: 621 Stereo Amplifier £132.00; 623 AM-FM Stereo Tuner £140.00; 624 FM Stereo Tuner £109.00; 625 FM Stereo Receiver £198.00; 626 AM-FM Stereo Receiver £232.00. Prices are RRP, include VAT @ 12½% and are correct at time of going to press.

Looking Back Peter Gammond

THERE is a conflict in reviewing records that no amount of experience quite resolves. Most mature and broad-minded reviewers seem to have come to the conclusion that there is really no *one* way of conducting a performance, and totally conflicting interpretations can be equally valid. The ordinary record buyer simply cannot afford to so broad-minded. He cannot dither pleasantly through a dozen versions; he wants to find one that is absolutely right for him and he expects the reviewer to guide him toward it. The reviewer has also a personal favourite and because he has to make this clear choice for his readers he finds himself tending to dismiss recordings that both he and others could admire for other reasons. It was a couple of versions of Haydn's 88th that set me on this train of thought. I have always thought it one of his finest symphonies. It has one of the liveliest finales ever written which you can treat in two opposing ways; you can make it happy and relaxed or you can make it tense and exciting. I happen to like the first approach and I found my ideal many years ago in an early LP version by Münchinger (LXT5040)—long absent from the lists. Since then I have heard half-a-dozen performances by top conductors and never found quite the same easy happiness. I've been listening to two performances this month, by Previn (HMV ASD3328) and Colin Davis (Philips 9500 138). Previn goes for the drive and excitement, Davis the natural, relaxed approach which is so near to my ideal that my personal choice

could not be otherwise. Yet Previn achieves an overall effect that I know would please many people more than the other. Previn offers also the affable No. 96—in which he indulges in an unnecessary mannerism in the delightful trio of the minuet; but a nice coupling. Davis has the less personable 99 which he plays with the same charm as 88. Davis for my money—but, dare I say it, you really ought to hear both; half the fun of records is making comparisons.

We are creatures of habit. I waited eagerly for the recording of Elgar's *Coronation Ode* (HMV ASD3345) and it really is a splendid work within the limitations of its particular purpose. But I was really thrown off balance by hearing 'Land of Hope and Glory' as originally conceived and played. No wonder there were carpings at Elgar's alterations of the melodic line. It sounds, at first, as if the singer has forgotten to come in at the right moment. As long as you have a good straightforward 'wrong' version, as sung at the Proms, to hand, you'll enjoy hearing this authentic reading.

Ah, yes, said my wife—Ann Ziegler and Webster Booth and, like many people, I think she may have had in mind a pair of vocal Liberaces, playing to the gallery. I was almost as pleasantly surprised to be reminded what a fine soloist Webster Booth was, with a beautifully clear, articulate tenor voice. I think many will find happy recall (and some discover for the first time) in a fine record that ranges from Handel to G & S (HMV HLM7109). I hope that a Ziegler and Booth

selection will follow for they gently introduced me to a lot of my favourite music, usually in English, but always done with taste and a lively touch. Thinking of duets (and absolutely no comparisons intended), isn't it time, too, that WRC or somebody revived Flotsam and Jetsam for us?

After the big gestures of the romantic repertoire, it is always refreshing to turn to the unassuming and civilised music of the 16th and 17th centuries; like a bicycle ride down a quiet country lane after motoring on the M1. It was in this escapist mood that I got mental refreshment from a lovely record called 'Music from Venice' (Argo ZRG859) with music of the Gabrieli's and the like. Thus refreshed then ready to tackle the sterner slopes of Sibelius. All I can say is that Colin Davis does it again: a magnificent, spacious performance of Symphony No. 2 (Philips 9500 141) which, because of its relaxation and naturalness, seemed, in the end, as cool and refreshing as the music of the far-off 16th century. By now I was ready for the glorious and invigorating vulgarity of Meyerbeer's *Le Prophète* (CBS 79400). Meyerbeer, out of fashion for many decades, was once tremendously influential and popular and you can see, within this adventurous work, which had a ballet on roller-skates (successfully revived as *Les Patineurs*), why he should have so impressed himself so much on the early Victorian scene. Meyerbeer is only unfashionable now because he put so much brash energy into quite serious stories. However, CBS deserve our undying thanks for the adventurous way they have been serving the opera-lover in recent months.

Things I Hear Arthur Jacobs

ANTAL DORATI's love-affair with Haydn was not exhausted by the complete symphonies. By the time these lines appear in print, he will have recorded *The Seasons* in London for Decca with the Royal Philharmonic Orchestra and Laszlo Heltay's Brighton Festival Chorus. A concert performance at the Royal Festival Hall with these forces served as a trial run, and prompted a veteran orchestral player to remark to me that the RPO had not essayed the work since Beecham's day, a quarter of a century ago. Echoes of Mozart and foreshadowings of the Romantics are among its pleasing features.

I learned later from Dorati that the soloists on the recording would not be the excellent trio we had heard (Jill Gomez, John Shirley-Quirk and Robert Tear in his finest form) but Ileana Cotrubas, Werner Krenn and Hans Sotin. There is something to be said for two German soloists in a German language work, I admit. In concert, with British soloists, the German text was a bit of an imposition. But I hasten to add that what I want is a good new English version, not the creaky old one. In the parallel case of *The Creation*, a re-done English text is an even more urgent need. Many listeners are deceived into supposing

that the current stupidities ('the flexible tiger' and so forth) are in some sense the composer's own.

WERE YOU EVER bothered, on hearing a flute in the concert-hall, by the extraneous noise of the player's in-drawn breath? Of course not—you don't get that close. So why should a record-producer put his microphone(s) so close that you are exposed to that unwanted sound in your living-room? That is the trouble with Eugenia Zukerman's recording (CBS 76594) of the two Mozart flute concertos plus the Andante in C for flute and orchestra, and is one reason why I prefer the better-recorded James Galway version of the identical works (RCA LRL-1 5109).

I hope we shall not have to consider this close-miking a CBS 'house style'. My fears are aroused by the Murray Perahia recording of the Mozart piano concertos in E flat (K.271) and C (K.267) on CBS 76584, where I have a parallel feeling of being thrust against the hammer-action of the solo instrument. In the same two concertos, Nina Milkina's welcome come-back (Pye Nixa PCNH 1) is more happily balanced as well as more genially played, even if requiring a boost in the treble.

AFTER ALL THAT has been admiringly written about the records of the Concentus Musicus, the Viennese group which handles the authentic instruments of the baroque period with so much flair, it was fascinating actually to see them on the Queen Elizabeth Hall platform. Disdaining a spike, Nikolaus Harnoncourt grips his cello between his knees as he directs the ensemble. His reasoning is that if you want Bach's sound you must not only have Bach's instruments, strings, and bows, but also the muscular movements which Bach's own players made. Who could quarrel with that, since the musical result is so fine?

I was less impressed with another English Bach Festival import, the Collegium Aureum from Germany. Conductorless, they played the Beethoven Triple Concerto supposedly with 'period' instruments and with the same soloists (Paul Badura-Skoda, Franz Josef Maier, Anner Bylisma) as on their now deleted Telefunken recording. But they permitted all kinds of solecisms, including the bunching of all the string instruments together on the platform instead of the old left-right opposition between first and second violins. My guess is that Christopher Hogwood and Trevor Pinnock, directors respectively of the Academy of Ancient Music and the English Concert, are going to show us better what the 'Viennese classical style' really was.

ABBEY

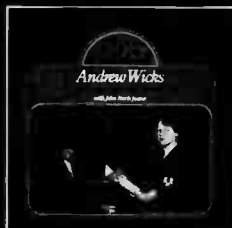
5 significant new Abbey releases



LPB 753
Benjamin Britten
Church Music Vol 1
The Choir of New
College Oxford
Directed by David
Lumsden
Te Deum in C—Jubilate
Deo Antiphon, opus 56b
—Hymn of St. Columba,
A Hymn to the Virgin,
Hymn to St. Peter,
Hymn to St. Cecilia.



LPB 780
French church music
Worcester Cathedral
Choir Directed by
Donald Hunt
Mass in C sharp minor
(Vierne) Litanies à la
Vierge Noire, Exultate
Deo Salve Regina
(Poulenc) O Sacrum
Convivium (Messiaen).



LPB 778
Andrew Wicks, Treble
with John Birch, piano
Songs and arias by
Arne, Britten, Mozart,
Shubert, Vaughan
Williams etc.



LPB 760
David Lumsden plays
Bach at New College
Oxford
Prelude and Fugue in
B minor—Pastorale
BWV 590—The
Schübler Preludes.



LPB 765
The Dolmetsch
Consort Favourite
recorder music from
five centuries
Medieval, Renaissance
and Elizabethan
Consorts, and works by
Couperin, Purcell,
Handel and Gordon
Jacob.

We are 10 years old! A time to celebrate, take stock and set course for our second decade. For a start, we have given Abbey a new look. But there's a lot more to it.

From now on, we aim to double our annual output of new releases. And they'll become available through far more Abbey appointed dealers and stockists. Abbey retailers will benefit from a faster service, speedier distribution and more counter leaflets, promotional aids and release information.

In short, a far better service for your Abbey dealer and that means better service for you too.

We are going to do all this and more—but one thing will not change. Our dedication to producing the finest recordings—recapturing authentic sound in natural surroundings.

*Ask your local dealer for full details
of these new releases and a copy of the new
Abbey Catalogue, or write to us direct. Abbey Records Eynsham Oxford.*

**For the finest authentic sound in Choral, Organ, Instrumental
and Vocal music—Ask for Abbey.**

Record Reviews



DER ROSEN KAVALIER

examined by Peter Branscombe

R. STRAUSS: 'Der Rosenkavalier'
Lear | Bastin | von Stade | Hammond
Stroud | Welting | Morpurgo | Atherton |
van Santle | Smit | Goodhardt | Coppens |
van Limp | Carreras | Members of the
Helmond Concert Choir | Chorus of the
Netherlands Opera | Rotterdam PO | de
Waart
Philips 6707 030 (4 records) (£15.96)

Der Rosenkavalier has been lucky on record, and it certainly deserves its luck. There are memorable features about all the versions there have been, whether complete or incomplete, and the Decca recording conducted by Solti which came out nearly eight years ago (it seems much more recent!), set new standards in respect of both performance and technical quality. Let it be said at once that the new Philips version, utterly different in some of its fundamental premises, is going to prove a worthy rival. Comparison with other versions is probably pointless—the lovely old Kleiber set, now available again at low price from Decca, is, like the incomplete

'30s excerpts under Heger, for people with nostalgic memories rather than for the moderately high fidelity fans. The Karajan set, also refurbished since the first appearance of the Solti version, undoubtedly has its great virtues, though there again the sound is bound to prove elderly (it dates from 1959).

Despite Strauss' Bavarian characteristics and background, *Der Rosenkavalier* with its poignant and poetic Austrian libretto has long since come to be considered as archetypally Viennese. A glance down the cast-list for the Philips recording reveals not a single Viennese name. Solti had some of the wonderful old *Staatsoper* singers from the past taking small parts and making them vividly their own; for his principals, Solti looked elsewhere. Opinion was divided about Régine Crespin's Marschallin, but at least Solti's singers were familiar with the ambience of the international

Rosenkavalier tradition. This is not the case with Edo de Waart's cast. And yet I have no doubt that this daring experiment is going to prove highly successful. Here is a very beautiful account of this well-loved opera, one that it will be a pleasure to live with. I certainly noted down passage after passage where the German pronunciation would not pass muster in the Palais Rofrano or round the corner in Lerchenfeld, and yet there are plenty of compensations. There is little trace of tired tradition here, but instead, a fresh, warmly appreciative approach.

Edo de Waart takes a broader view of the score than do for instance Kleiber father (the old Decca set), or more especially son (a brilliant, quicksilver reading from the 1973 Munich Festival, later broadcast by the BBC). De Waart just occasionally favours tempi that his singers have some difficulty in sustaining. But the clarity of the textures (aided by a rich yet clean recorded sound), the tenderness with which the excellent Rotterdam Philharmonic woodwind and horn players turn their phrases, the sheen of their string tone—all these virtues would fade had the desire for forward drive been stronger.

The cast, though largely unfamiliar, is strong and has been carefully chosen. Jules Bastin is an impressive Ochs; he sings finely, avoids horseplay, brings the character to sympathetic life. If there is nothing to savour in the way one savours individual phrases as sung by great Ochs of the past, Bastin sees the part whole—no negative virtue, that. Dereck Hammond Stroud makes Faninal more interesting, likeable even, than usual. And James Atherton radiates mischief and joy as the Italian intriguer. José Carreras sings the famous Italian aria too loudly and emphatically, though otherwise with fine style and tone; many of the small and

very small parts are deftly done.

The ladies of the cast tend to steal the show in *Der Rosenkavalier*, understandably enough in view of Strauss' soaring melodies with which he favours them. Frederica von Stade is a lovely Oktavian—rapt, magical even, with radiant line in her passionate love-music and pleasingly unexaggerated in double travesty. Ruth Welting is the Sophie—she sounds well able to take care of herself, which is a justifiable view; but I wish she had offered greater gentleness and ardour in her music with Oktavian. Evelyn Lear, who sings the Marschallin, joins the ranks of those who make a fine attempt at the part without mastering its taxing and varied demands—in this respect, I hasten to say, she is certainly no less successful than the other singers of the part on record. She does some things superbly well, yet she often changes voice disconcertingly in mid-phrase, and when excited she tends to swallow upbeat notes and syllables; she is at her best in much of the closing scene of Act I.

The performance has, miraculously, something of the feel of a stage production without the distractions that so often accompany one—I noted natural sounds (voices off, cup on saucer, book banged down) rather than sound effects. Balance is happy between orchestra and singers as well as between one singer and another. The intrusions of Ochs unruly retinue and the fun and games in the inn are firmly kept in place as lively yet musical happenings. To sum up what are only excited, still confused first impressions: this set will not replace Solti's in my affections, it may not quite come to equal it in my maturer estimation, but I am sure it will act as the perfect antidote to any too indulgently Viennese performance, live or recorded [A: 1 overall].

RECORD RATINGS

Record Ratings are designed to summarise our critics' findings, but should preferably be noted in conjunction with the full reports—and taken as a guide only.

Recording	Performance
A	Very Good
B	Good
C	Moderate
D	Poor
H	Historical (pre-LP)
	H (or 1, 2, 3, 4 as appropriate)

Occasionally a record may be worthy of special mention, taking it beyond the 'very good' bracket. In such superlative cases a star is added to the letter or figure as appropriate: e.g. B: 1* A*: 2 or (exceptionally) A*: 1*. See *Hi-Fi News & Record Review*.

INFORMATION

STEREO, MONO, QUADRAPHONIC and STEREO TRANSCRIPTION

Any record reviewed in this magazine may be assumed to be stereophonic unless its number is accompanied by:

M (monophonic)

T (stereo transcription)

Q (quadrasonic: stereo compatible)

R refers to a U.K. reissue

Cassettes are Dolby unless otherwise stated.

RECORD FAULTS

'Recording' ratings should be taken to refer to recorded quality, but do not take account of individual pressing faults encountered with our test samples. Readers may assume that a certain proportion of such variable faults might occur among commercial pressings.

PRICES

We do our best to ensure that prices given are correct, but we cannot always guarantee accuracy, since price rises are too frequent and often arrive just as we go to press.

Best of the Month

Accardo's Bach	104
Two lots of Beethoven Sonatas	107
More Beethoven Sonatas	107
Recommended Bliss from Berglund	108
Reiner's Brahms 4 naturally	108
Britten's 'Phaedra'—and others	109
Perlman's Bruch violin	109
Philip Jones: diverting pieces	111
An Album of English Songs	112
Hindemith chamber from Vienna	113
Splendid Improvisations	115
Stokowski's unique Scheherazade	119
Scarlatti sonatas from Rowland	119
Glorious Walton from Frémaux	123

J. S. BACH: Concertos for violin in E and a (BWV 1043/1042) Concerto in d for two violins* (BWV 1043) □ Air [BWV 1043, 2]
Henryk Szeryng (vln) / Maurice Hasson (*vln) / ASM / Marriner
Philips 9500 226 (£3.50)

The St. Martin's manner of Bach performance emphasises colour and phrasing in ways that are far removed from the string techniques known to Bach: so, however, do most other interpretations on record. Henryk Szeryng's personal approach has usually been far more detached and classical. Here we see the extraverted and the introverted extremes in combination, and the contrasts of personality provide much food for thought: in the slow movements, the soloists seems to inspire a less emotionally licentious approach than that usually associated with his accompanists, yet in the faster outer movements, he is drawn to play with more projection, life and colour: neither to the loss of the music, as I see it.

Whether it be the fault of Marriner or of Philips' production team, a considerable degree of latitude has been allowed to the orchestra's upper strings in intonation, and the blending here is somewhat variable: even Szeryng is not always faultless in precision or ensemble. One is led to wonder whether slackness of this kind would be permitted in Mendelssohn or Brahms, and how far this will come to jar on repeated hearings.

In the 'double', Hasson blends well in tone, but proves slightly less tidy than Szeryng in bowing and projection. There is one specially attractive feature of the disc which will appeal to many: the unhurried, yet rhythmically lively speeds of the two solo finales. They sound highly attractive and dance-like in this guise—all credit to Szeryng and Marriner for revealing this. However, any hopes that the 'double' will gain similar treatment are rapidly dashed: this movement is probably the worst on the record. Recording pleasant if undistinguished. [B: 2] *Stephen Daw*

J. S. BACH: Trio Sonatas 5 in C, BWV 529 □ 6 in G, BWV 530 □ Prelude and Fugue in b, BWV 544 □ Prelude and Fugue in c, BWV 546
Charles Benbow (org)
Philips 'Universo' 6581 019 (£1.99)

The German Evangelical Church in Paris was the venue for this recording by the well-known recitalist, Charles Benbow. As befits the building, the organ is a neo-classical design by Detlef Kleuter (2M+P), built in 1964, and its rich, outspoken tonalities belie its modest proportions. Here we have thoughtful, straightforward Bach-playing, without gimmicks, the sonatas being lively without undue haste, and pleasingly registered. The other works are decidedly more deliberate—not to say a mite ponderous here and there, but they are never pompous, and the part writing is always scrupulously clear.

The review pressing was typical of Philips productions, giving crisp quality, with the rather wide image so beloved of most companies, with its associated well-spread ambience. Quiet backgrounds, naturally, and flawless surfaces—excellent all-round value. [A: 1] *Trevor Attewell*

J. S. BACH: Suites for unaccompanied cello, BWV 1007-1012
Henri Honegger (vlc)
Telefunken EX 6.35345 (3 records) (£11.25)

The Swiss cellist Henri Honegger, a veteran performer of distinguished lineage, was the first man ever to perform all six of Bach's solo Suites in one concert: that was in 1950, by which time he was already 45-6. His tone is warmly lyrical—closer to Fournier than Tortelier on disc—and his style of delivery relaxed and expansive, yet quite steady rhythmically. The deep feelings in his interpretations lie beneath the surface, rather than upon it, and if the total effect of his approach is somehow a little lonely or even bleak, at least this appears to be a beautiful sadness.

The position with regard to Bach's Suites is, of course, not uncompetitive: Casals' late recordings included a super-excellent account of the high-set No. 6: Honegger runs him a close second, here. The Tortelier box is very tidy and controlled, but I find it curiously unmoving—especially from an artist whose live performances have commanded such wide acclaim. Fournier is closer to Honegger's lyrical restraint, but somehow less sad, as well as less moving.

The Valois-Telefunken sound is rather resonant and echo-ridden: however, the detail is well captured—even some occasional insecurities of bowing and extraneous sounds are revealed, the latter notably in the beautiful Sarabande of the C minor Suite. However, the playing has character and conveys a sense of fond familiarity with the music, and there is much to delight both connoisseurs and amateurs here. [B: 1] *Stephen Daw*

J. S. BACH: Sonatas and Partitas for unaccompanied violin, BWV 1001-1006
Sandor Vegh (vln)
Telefunken EX 6.35344 (3 records) (£11.25)

The Hungarian-born violinist Sandor Vegh is best known internationally for his work with the Bartok and Vegh string quartets. On records, he has come to be associated with a special tenderness in off-the-string bowing, with a sinewy, rather than a prominently *cantabile* tone, and with a ready emotional interpretative response. These characteristics are all present in his recordings of the Bach solos for Valois/Telefunken, but, as so often, Bach's music brings special challenges seldom encountered elsewhere, and the conclusion here must be that basic faults become apparent in Vegh's technical and musical equipment.

Especially, he proves unsteady—even unreliable—rhythmically. Sometimes this seems to be a matter of an over-emotional response to Bach's music—for example, in the famous *Ciaccona*, which is divided into variations of individually contrasting speeds: at others, the basic pulse has been lost, rather than stretched. Another frequent shortcoming appears in his intonation: everybody knows how hard these pieces are to play at all, but it surprises me that an artist of Vegh's stature should have allowed the poor tuning at the start of the E major Prelude to be perpetuated at all, let alone published; there are many similar passages in each work.

The engineering and recording have been pleasantly handled, and the recorded tone strikes me as authentic, if slightly veiled—a feature I have observed in other Valois products. A far more consistent recording by an East European—still available, despite the catalogues—is Novotny's account on Supraphon 111 1101-3—a bargain buy. [B: 2/3] *Stephen Daw*

Excellent Accardo Bach

J. S. BACH: Sonatas and Partitas for unaccompanied violin, BWV 1001-1006
Salvatore Accardo (vln)
Philips 6703 076 (3 records) (£10.50)

Philips record so little Bach that it will strike many readers as strange that they should provide a second recording of these works, of which they are already considered by many to offer the superlative version, played by Grumiaux. However, a specially warm welcome must be given to this alternative reading by Accardo, which provides a really outstanding contrast in style to the Grumiaux—as well as being in many respects excellent in its own right.

Accardo's Italian upbringing and experience—especially with *I Musici*—has resulted in a natural flair, a warm, singing tone, and a neatness with the bow, especially

at its point. His Bach sings with a relaxed luxury, and even in the rapid *perpetuum mobile* movements, where he tends to indulge in expressive devices foreign to the style of the music, a spirit of expressive affinity with the composer is somehow conveyed. Naturally, the lyricism, the expressive warmth and even the technical control of his playing all depend heavily on his strong sense of movement and shaping: the Andante of the A minor Sonata has a sense of springing life as well as one of reflective beauty, for example.

In comparison with Novotny on Supraphon or Grumiaux, even—who is himself not as faultless as some have made out—Accardo is slightly inconsistent: some movements are absolutely breathtaking; others seem not to have fired his imagination, not to have come to him easily. There is nothing here that is ugly, however, and the whole venture has a freshness and an immediacy that I am still enjoying after repeated hearings. A fine young Bach soloist, and excellently recorded. [A*: 1*/1] *Stephen Daw*

DIEGO BLANCO PLAYS BACH

Diego Blanco (gtr)
Swedish Society SLT 33226 (£3.75) (distributed by Rediffusion)

The programme here consists of transcriptions: of the 'cello suite No. 3, the Chaconne from the Partita No. 2, and the Prelude and Fugue BWV998. Bach had certainly no inhibitions about transcriptions; but special problems arise with works which were written for instruments which can sustain a note when they are transcribed for those which cannot. Hence it is not altogether surprising that the two lute transcriptions go better than the other, larger works. Diego Blanco is a very fine performer indeed: his finger-work, both on the strings and on the fret-board, is admirable, and he has an unusual freedom from fingering-noises. From that point of view there is little to do about this record other than to enjoy it. What is more questionable is his approach to the playing of Bach, and it is one in which he is not alone. When Bach is played on the guitar, it takes a master like a Bream or a Williams (whose complete set of the lute suites was such a notable triumph) not to succumb to the trap of excessive—almost obsessive—adherence to the dogged rhythms. Blanco makes great efforts towards flexibility and delicacy, but not always, as it seems to me, with success. The result is that what ought to be superb performances are less moving than they should be, and one tends to concentrate on the virtuosity rather than upon the music. Hence it is with some relief that one arrives at the two final items; and I commend in particular the final fugue. It should be said that those who are trying to play the classical guitar should certainly obtain this record: they will learn a great deal from it.

The recording is very good indeed. I need say no more about it than that, when played at the correct level, it really does sound as though Diego Blanco is in the room: with a single instrument that is possible, and that, after all, is what hi-fi means. [A: 2] *Peter Turner*

SIR JOHN BARBIROLI, CH

Sir John Barbirolli (vc) / C. B. Rees (interviewer) / various instrumentalists
Barbirolli Society BS 03 M (£2.99)

Many of the millions of admirers of the 'great John', as Vaughan Williams called him, will know that he started life as a concert 'cellist, but few can have heard him play.

Now they have the opportunity, albeit by means of elderly, din-bedimmed recordings which nevertheless reveal clearly what superb tone, style and phrasing he achieved. There are extracts from works by Popper, Loeillet, Purcell, Gibbons, and the recital concludes with a performance of Vaughan Williams' 'Phantasy Quintet', in which J. B. forms part of the Music Society String Quartet plus Jean Puggnet. This is a total delight: J. B. knew the works of V. W. as few others have done, and surely this interpretation must be a close approximation to the thought of the composer himself. The record is worth acquiring for this item alone.

The second side is a broadcast talk between J. B. and C. B. Rees. It is an historical retrospect on his life up to 1960. Sir John was a splendid talker and raconteur, and he is in great form here. How good it is to hear him again! But what emerges more than anything else from the whole of this disc is the immense love of, and dedication to, music which was the driving force behind this splendid and gifted man: to say that he lived for it is no less than the simple truth. Vastly human he may have been—with his love of cooking and savour of the good life—but it was music which meant most to him. Praise be, he had the talent to translate that love into creative achievement. He became, and remained until his death, one of the great international figures, and those of us who saw and heard him many times will remember him with love and gratitude. [H: 1] *Peter Turner*

BAROQUE MASTERPIECES FOR TRUMPET AND ORGAN

Sonatas and Suites compiled from music by Boyce, Greene, Krebs, Stanley, Pezel, Prentz and Purcell
Edward Tarr (tp) / Bengt Eklund (tp) / Helmut Bocker (bsn) / George Kent (org)
Nonesuch H-71279 (£1.85)

The four valve piccolo trumpet pitched in B₃ used in this recording is a far remove from the instrument displayed in the photograph on the sleeve. The photograph clearly shows Mr. Tarr holding an 18th century valveless clarino trumpet. Putting aside the argument for instrumental authenticity, I found these performances to be very polished and professional. The tromba da tirarsi employed in the Krebs really does sound like a period instrument.

Before I recommend this disc I would just point out that many of the pieces comprising this programme are not authentic compositions for the instruments concerned but are transcriptions of organ voluntaries and pieces of a like nature. The recording, which is extremely well engineered, was made in Italy. [A/B: 1/2] *Victor McAloon*

BAROQUE SUITES

Works by Lully, Vejvanovský, Fischer, Scheidt and Telemann
Musica da Camera Praga
Supraphon 1 11 1867 (£2.75)

The suites of dances on this disc came from both the early (Samuel Scheidt) and the late (Telemann) baroque and are played on modern instruments, a seemingly arbitrary collection of flute, oboe, violin, viola, cello and harpsichord, by Musica da Camera Praga who are mainly soloists with the Prague Symphony Orchestra. Most satisfying are a Telemann suite and a suite by Jean-Baptiste Lully from his tragedy *Armide and Renaud*, but although all are excellently played, one is left with the feeling that the use of modern instruments is anachronistic, the instrumental tone being inappropriate.

This doesn't apply so much to a transcription of a keyboard suite by the extravagantly named Johann Caspar Ferdinand Fischer, a predecessor of Bach, but on a suite for five voices and continuo by Samuel Scheidt, whose music has very much a Renaissance flavour, containing as it does a *Galliard Battaglia*, it is very obvious. This 'Battle' is so wrong on warm-toned modern instruments; the Philip Jones Brass Ensemble get more of the right spirit with it on Argo, but it needs the roughness of cornetts, sackbuts, shawms and curtals to give it life. The recording is reasonable, a little close at times and a slight pre-echo is noticeable. [B: 1] *John Atkinson*

BEETHOVEN: Symphony 4 in B₇, Op. 60

RPO / Dorati
DG 2535 218 (£2.15)

The string pianissimi in the introduction define the character of this recording: not hushed and atmospheric, but bright and explicit in tone. Dorati's tempo for the *allegro vivace* is one of the fastest I have heard, and the sense of vigour extends into the adagio too. The trio is rather slow for its context. All repeats are observed.

This is certainly a bracing account of the symphony, with inner parts sharply defined. Perhaps it is best to listen as if it were by Haydn. The disc is transferred at a very high level, which brings out the level of mastertape fuzz, especially when faded down for movement-scrolls. The rests in the bars before the great fortissimo chords at the end of the slow introduction are discoloured by a blurry, ringing pre-echo, or print-through. The sound is generally much coarser than the previous transfers in Dorati's RPO series, thus, although this is the most convincing reading so far, the engineering is too aggressive for a wide recommendation. The studio used seems to have been fairly small. [B/D: 1] *Christopher Breunig*

BEETHOVEN: Symphony 7 in A, Op. 92

Hallé Orchestra / Loughran
Enigma VAR1037 (£3.49)

Better recorded, and with an ounce or so more tension in the outer movements, and this would have been an outstanding Beethoven *seventh*; what we do have is far from negligible.

Loughran includes all repeats, like Solti (i.e. even the trio from 441-482). But he is consistently more revealing than Solti, and although the Hallé strings could do with more weight, his version sounds much more authentic than the Chicago Orchestra's. Tempi are well-chosen, and Loughran's aim, to strip the score clean again, is largely realised. I would have liked the coda to the scherzo to have had greater dramatic force, and the first-movement a less relaxed approach. However, I suspect that in the hall this performance would have carried greater impact than on disc, for the recording is resonant and rather vague. Tutti take on a muddy character—one is aware of drums and strings, but the rest is opaque. The general balance is recessed, and an abnormally high replay level is required. I am glad to see that Enigma pressings are now appropriately sleeved, with high-density lined inners. [B/C: 1] *Christopher Breunig*

BEETHOVEN: Piano Sonata 16 in G, Op. 31: 1

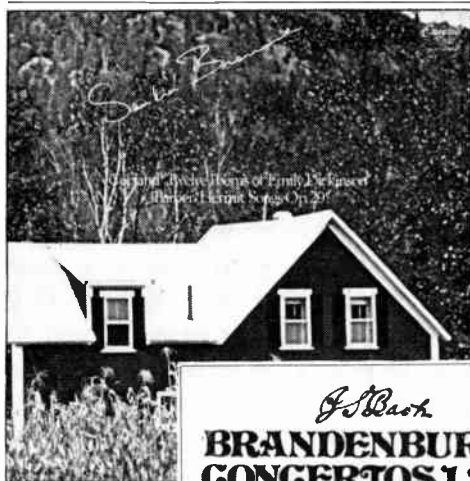
□ 18 in E₇, Op. 31: 3 □ 20 in G, Op. 49: 2

John Lill (pno)
Enigma VAR1003 (£3.49)

John Lill's Beethoven is not unlike Roger Woodward's. Both are inclined to deliberate tempi and emphatic accents; neither offers

Sandra Browne
 John Lill
 Manoug Parikian
 Yorkshire Sinfonia
 George Malcolm
 Northern Sinfonia

Six good reasons for looking at Enigma's five new releases for July



Sandra Browne
AMERICAN COLLECTION
 Michael Isador (Piano)
 Copland "Twelve Poems of
 Emily Dickinson"
 Barber "Hemmit Songs Op. 29"
 Record VAR 1029 Cassette TC VAR 1C29

John Lill
Beethoven Piano Sonatas
 Sonata No. 15 in D, Op. 28 (Pastoral)
 Sonata No. 26 in Eb, Op. 81a (Les Adieux)
 Sonata No. 27 in E Minor, Op. 90
 Record VAR 1004 Cassette TC VAR 1004

The Yorkshire Sinfonia
 directed by
 Manoug Parikian
J. S. BACH MUSICAL OFFERING
 Record VAR 1044 Cassette TC VAR 1044

George Malcolm
 Northern Sinfonia
J. S. BACH BRANDENBURG CONCERTOS 1, 2 & 3
 Record VAR 1041 Cassette TC VAR 1041

George Malcolm
 Northern Sinfonia
J. S. BACH BRANDENBURG CONCERTOS 4, 5 & 6
 Record VAR 1042 Cassette TC VAR 1042

ENIGMA CLASSICS



CLASSICAL TRUTH

Sold and distributed by CRD Ltd Lyon Way
 Rockware Ave Greenford Middx. Tel 01 578 4311

Sold and distributed by Selecta Group
 (A division of The Decca Record Co Ltd)

Available from all good record shops on record & cassette

consistent standards of pianistic finish, nor do they wholly avoid an air of lecturing about the music, in black and white terms, rather than submitting a clear interpretation to the listener.

Lill seems unable to convey any sense of Beethoven's playfulness, nor does he enthral. More seriously, he rarely seems able to release the music in a flowing way, or to paragraph it so that we are confident that he sees the total shape, and the true relationship of the various sections. For example: in the slow movement of the G-major, Op. 31, before a cadenza-like passage, Beethoven separates the hands, the left limping after the right one semiquaver distant. In Gilels' reading (DG) the effect is that of a simple idea made luminous and mysterious; Lill presents it baldly, leaving the *listener* to decide what it signifies. But then, after the cadenza, he suddenly accelerates then ritards the accompanying figure, i.e. makes a bold (and unconvincing) decision to depart from literal observance of note-values. Gilels, by contrast, resumes the flow: a reassuring base above which the right hand makes complex and fluid subdivisions of the beat.

This Enigma coupling is fairly interesting, and it is well engineered, but Lill is too rigid, too variable for whole-hearted acceptance as an authority on these sonatas. And too many details are awkwardly resolved for unreserved admiration of technique. [A: 2/3]
Christopher Breunig

Double Starred Beethoven Double

BEETHOVEN: Violin Sonata 1 in D, Op. 12: 1 □
10 in G, Op. 96
Vladimir Ashkenazy (pno) / Itzhak Perlman (vln)
Decca SXL6790 (£3-50)

As noted by Peter Branscombe, this coupling illustrates the remarkable change in Beethoven's musical language, in only fourteen years' span.

Ashkenazy and Perlman take the opening *allegro con brio*, of the first sonata, at a relaxed pace; they also give the repeat. One feels there were no temptations to hold the listener by means of impressive brilliance. This sonata includes a marvellously cheerful Rondo. In the first movement of Op. 96, violin and piano often move in parallel—the ease with which this is accomplished, and the unanimity of expressive style in the slow movement, demonstrate the degree of rapport between these players. An altogether rare musical affinity that nevertheless permits two distinctive personalities to be defined. As if appreciative of this, the producer has balanced violin and piano impeccably. The sound is beautifully clean and extended. An unreserved recommendation. [A*: 1*]
Christopher Breunig

BEETHOVEN: Violin Sonatas: 2 in A, Op. 12: 1 □
4 in a, Op. 23
Claudio Arrau (pno) / Arthur Grumiaux (vln)
Philips 9500 263 (£3-50)

This is another in the complete set of Beethoven's sonatas by two superb artists; and it is at least the equal of any of the others. I have heard many performances of these works which achieved a higher voltage, so to speak, but in the whole series Arrau and

Grumiaux have chosen a somewhat contemplative, splendidly mature approach. Neither is any longer young; both have studied these works over the years and decided how they see them. It is an admirable vision: one of unity and exposition, of tranquillity and a somewhat autumnal peace: one which will satisfy far longer than the more superficial fireworks one sometimes hears.

As an ensemble, these two are exceptional—note the fugal passages which abound in No. 2. The works were written very much for two equal partners, and that is what we get. Grumiaux' tone in the upper register is so pure and lovely that one wonders if there be any contemporary who can match him in that: the second movement of No. 4 is a masterpiece of the rare kind which leaves one crying out for more—and happily, through the magic of the gramophone, it is always there to be repeated. Had this been a live performance, one might have wondered if one could have been wrong to remember it with such emotion.

Once more the Philips' engineers have not failed the players or us: the balance is perfect, the perspective natural, the 'fi' outstanding but unexaggerated. On my test pressing there is a great deal of rumble which I shall assume to be absent from production copies. Even with it, this is a precious and memorable issue, which it would be folly to deny oneself. One can say the same of the whole series; and that is very rare. [A*/: 1*]
Peter Turner

BEETHOVEN: Prometheus, Op. 43—Overture; Adagio-Andante; Finale □ *Overtures—**Egmont, Op. 84** □ **King Stephen, Op. 117** □ **Consecration of the House, Op. 124** □ **Coriolan, Op. 62** □ **Fidelio, Op. 72b** □ **Leonora 1, Op. 138** □ **Leonora 2, Op. 72a** □ **Leonora 3, Op. 72a**
NPO / *Philharmonia Orchestra / Klemperer
HMV SXDW3032 (2 records) (£3-99) *R 1958-64

A whole LP side of previously unpublished Beethoven/Klemperer is sufficient justification to highlight this album in our main columns, rather than in the reissue section. (To be precise, these *Prometheus* excerpts have formed part of a big EMI import set, available for a few years.) I also think these items would justify buying it, even if you have the bulk of the other material with the symphonies. The vintage is undisclosed, but Klemperer was clearly in great form: the overture is steady, but has a sense of movement; the slow movement with solos for harp, cello, and flute, is wonderfully spacious as a recording; the finale is smiling and far from heavy-handed—the opposite, in fact, for some short *rallentandi* have a soufflé lightness. It hardly matters that the recorded sound is not fully consistent between the three items, and the tape cut-off is abrupt for the *adagio-andante*.

The general sound of the overtures is slightly dim, by modern standards, but the excellent definition of instrumental positions (Klemperer's violins divided across stage) is not always matched nowadays. [A/B: 1*/1]
Christopher Breunig

Full and powerful Beethoven

BEETHOVEN: Piano Sonata 28 in A, Op. 101 □
30 in E, Op. 109
Vladimir Ashkenazy (pno)
Decca SXL6809 (£3-50)



Ashkenazy gives deeply committed, strongly individual readings of these late sonatas. His playing is full of poetic touches, such as the extended *tenuti*, where marked in the first movement of Op. 101. I am glad that, in a craggy account of the March, he omits the dubious repeat in the trio. His account of the long contrapuntal finale is very powerful.

Indeed, strength, fire, and poetry of an objective character distinguish these readings. Ashkenazy takes the *adagio* sections of the first movement of the E-major slower than anyone else I can recall, yet he manages to unify them with the *Vivace ma non troppo* contrasting passages. Some will undoubtedly be mildly disappointed that in the *fourth variation* of the finale the approach is not mystical, but both bright and free in feeling. And possibly the marked ritards over the last bars of trills will not bear easy repetition. But these are minor reservations when there is so much to enjoy. Perhaps I should add that Ashkenazy exploits all the tonal contrasts and dynamic range of the modern grand: in these two excellent Kingsway Hall recordings (1974 and '76) the sound is full and powerful. The end of Op. 101 will distress a lot of pickups; Op. 109 is easier to track, yet it seems to have a comparable sonority and presence. [A/A*: 1*]
Christopher Breunig

BENDA: Concertos for Harpsichord and Strings in f, b and G
Josef Hala (hpd) / Antonin Novak, Vojtech Jouza (vln) / Karel Spelina (vla) / Frantisek Slama (vlc) ; Frantisek Posta (vln)
Supraphon 1 11 2138 (£2-75)

Jiri Benda is another of that myriad group of Bohemian composers active in the transitional period between the baroque and the classical. His style has elements of both as can be heard in any of these three concertos. Their actual dates of composition are unknown, but is probably between 1755 and 1780. By this time Mozart had written the first of his original keyboard concertos and the comparison between any of Benda's and K175 will show just how much farther the younger composer had gone towards achieving a truly classical style. Within their limits, however, Benda's works are interesting, especially those in the minor keys, and in the

slow movements which appear to recognise the music of CPE Bach. The fast movements and the G major concerto as a whole lean more to the newer fashion. Hala uses a big toned instrument which the forward, slightly fierce recording tends to emphasise. Not that it is difficult when the accompaniment is a quintet of solo strings in which the presence of the violone as bass emphasises the transitional nature of the music. With so forward a recording the small number of strings is scarcely noticeable. The playing is sturdy and enjoyable, not over-refined, and can be recommended to anyone wishing to get to know the music. Benda's most important work, however, was in the field of vocal music and we need some of this before we can really assess his importance. [B:1]

Kenneth Dommett

BERLIOZ: 'Harold in Italy

Pinchas Zukerman (vln) | Orchestre de Paris | Barenboim

CBS 76593 (£2.49: limited edition)

A fresh *Harold* for the fourth year running, yet different again. Berlioz fares well here, with Barenboim conducting a Paris orchestra which seems to get better all the time, while Zukerman as violist is outstanding—apart, that is, from one over-emphasized phrase just before the arpeggio passages in the Pilgrims' March. Zukerman's rendering of the opening solo is the most beautiful I can remember hearing; with its gentle harp accompaniment, this has some of the intense and devoted quality of a great chamber music performance, and is star-worthy. However, the work is not a concerto but an 'Italian' symphony, with a viola representing Byron's wandering Childe Harold, so it is the conductor's overall conception which matters most. Despite an over-brisk middle section to the March and a very fast final flourish as the Brigands' Orgy ends, Barenboim's approach is biased towards the Byronic melancholy of Davis (Philips) rather than the fiery display of Mehta (Decca), although the big set-pieces are managed splendidly enough and one might well choose this version as an optimum introvert/extravert compromise.

A very good performance, then, but not quite matched by the recording, which, while good, is a little shrill and slightly weak in the bass. But judicious use of tone controls deals with this, while acoustics seem spacious, soloist is reasonably balanced, and dynamics are adequately wide. As so often happens, the repeated high string figures riding above the orchestra as it takes up the viola's theme in the first movement are almost inaudible, but this may be a musical rather than technical point—or simply my prejudice about the function of that particular bit of Berlioz's wonderful scoring! [B:1/1*]

John Crabbe

JUSSI BJÖRLING: RECITAL

Songs by Alfvén, Althén, Kjörling, Peterson-Berger, Sibelius, Sjöberg, Söderman, Stenhammar

Jussi Björling (ten) | Orch | Grevillius

RCA LSC 9884 (distributed by Rediffusion)

Björling and Grevillius always joined forces whenever the great tenor appeared at concerts in his native Sweden, and in 1957 they planned to re-record in stereo some of the songs which Björling had recorded on 78s. He made some titles in 1957 and a further batch in 1959, but only eleven were completed when he died in 1960. They show the singer in resplendent voice and he sings with great depth of feeling and dramatic power. There is no evidence that he was in

any way past his prime and in fact they include some of the finest things he had ever done.

The songs are love songs and patriotic songs and they are well recorded—I have given them an 'A' although they are nearly twenty years old—and that are excellently accompanied by Nils Grevillius and an unspecified orchestra. Presumably their appeal will be limited by the fact that they are all sung in Swedish and the short sleeve note in English gives no detail of their content. At the rather high price of approx. £4.50 (at time of going to press) one could expect a leaflet giving texts and translations of the songs, but one was not to hand when the record was sent for review. [A:1]

John Freestone

Blissful Berglund

BLISS: Cello concerto □ 'Miracle in the Gorbals'—ballet suite

Arto Noras (vlc) | SO | Berglund

HMV ASD 3342 (£3.50)

If ever there is a positive reappraisal of Bliss, these are two of the works most likely to loom large. The suite from *Miracle in the Gorbals* (1944) is well known, or used to be, but the Cello Concerto (1970) will be met with for the first time by many who buy this record. Although one of Bliss's last major scores, the Cello Concerto has a characteristic zest and vitality for which 'youthful' is the inescapable word; there is also great assurance in handling the medium, and the level of invention is unusually high—perhaps as high as in the very fine Clarinet Quintet. The brilliant solo part is splendidly played by Artos Noras, one of Berglund's compatriots and a former pupil of Tortelier. Clearly, he is a cellist of the highest calibre, not unlike Tortelier in point of style, but more agile, sometimes surer in intonation and commanding the attack of a Starker. This record is pleasing orchestrally, too, though the ballet suite does not quite have the incisiveness that Bliss himself would have given it. The recording of the Cello Concerto is both well balanced and comfortably distanced, with a warm, sympathetic tonal quality. On the other side the sound may be slightly brighter and more forward, but again very satisfactory. Recommended: not least to those who, like myself, still hope that Bliss was a better composer than they think! [A:1*/1]

Hugh Ottaway

Immediate Brahms 4

BRAHMS: Symphony 4 in e, Op. 98

RPO | Reiner

RCA 'Gold Seal' GL11961 (£2.49)

Released fourteen years after Fritz Reiner's death, this disc surely demanded something more than a bald historical note on the music: most purchasers will be curious about the circumstances that brought Reiner face to face with a London orchestra, in the recording studios. Nor does the sleeve credit the RCA producer.

For this is a gripping account of the work, more than equal in stature to the Philhar-

monia/Klemperer, available from EMI at this price-level. It is quite remarkable that a conductor who showed such mastery of detail, who could develop so fertile a performance, and whose Brahms had such a unique amalgam of spaciousness and taut power, should not have been persuaded to record a complete cycle. Disciplined though the Royal Philharmonic were, the Chicago players would have provided greater virtuosity, to better match Reiner's demands. One must note, though, the eloquent RPO flautist.

Some listeners will find Reiner rather cold in the second movement, where balance between upper/lower strings is improvisatory when the great theme appears. An adjustment of speed at the very beginning of this movement, and an underlined *ritard* before sweeping into the coda of the first serve to remind us that nowadays recording conductors are more often persuaded to take a comparatively neutral line! The sound here is very good; the orchestra is set well back, yet still has immediacy. The internal balancing is very natural. [A:1*]

Christopher Breunig

BRAHMS: Cello Sonata in F, Op. 99 | ELGAR: Cello Concerto in e, Op. 85

Pablo Casals (vlc) | Mieczyslaw Horszowski (pno) | BBC SO | Boult

HMV HLM7110 (M) (£1.99)

It is usual to describe Casals's 1945 recording of the Elgar as 'wayward' or 'idiosyncratic', which seems to me a wild exaggeration. True, the ambling principal theme of the first movement is pulled about a little, especially when the solo cello first takes it from the orchestra; but the performance as a whole has classic status for its profound self-communing without histrionics. The 1936 Brahms is likewise outstandingly fine. Very successful transfers from 78s, but with slightly more surface noise than some. The slow movement of the Brahms has subdued clicks, presumably from a cracked original. Excellent value. [H:1*]

Hugh Ottaway

BRAHMS: 21 Hungarian Dances

Michel Beroff | Jean-Philippe Collard (pno duet)

HMV HQS1380 (C) (£2.50)

Youthful, keen performances, polished in manner, but catching some of Brahms's wistfulness too, and a dark tone in his keyboard palette. This Pathé disc is well engineered, but not as impressive as the outstanding DG (2530 710), by the Kontarsky brothers. Now they are a phenomenon—like hearing one giant pianist with four hands. But Beroff and Collard will be preferred by those who find the Kontarskys too artful and aware. Katchen, on Decca, is not strictly comparable, for he plays 1–10 in his solo piano version (the stereo image is too widely spread there), an interesting alternative. Only the HMV is fully scrolled. [A:1]

Christopher Breunig

BRAHMS: Violin Concerto in D

Andrei Korsakov (vln) | Belgian RSO | Defossez

Heliodor 2548 263 (£1.35)

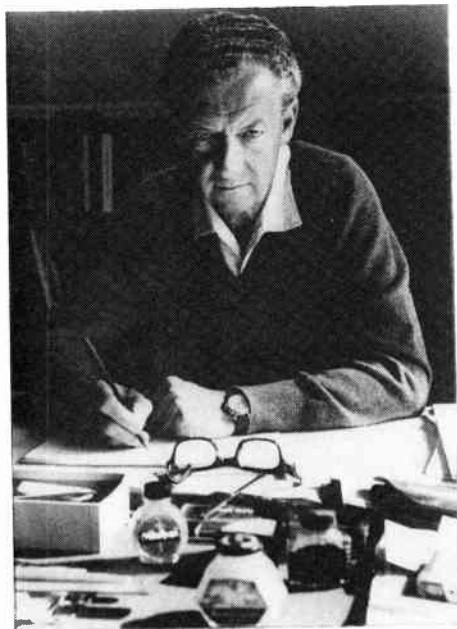
This is indeed a bargain. Brahms's Violin Concerto is magnificently performed by soloist and orchestra, and at its price undoubtedly heads the bargain offers for this work. Indeed I will go further. I have listened to four competitive discs throughout the price range and found that preferences of both recording and performances were merely a matter of swings and roundabouts.

The violinist here, Andrei Korsakov, a pupil of Kogan, is a young Soviet artist (he

was 25 years old when the recording was made) who won the second prize at the International Competition of Queen Elizabeth of Belgium in 1971. His immediately confident opening sets the scene of an artist who knows exactly what he is about to do, and he sails through all the notoriously difficult passages unabashed, yet always retaining pre-eminently the musical conception. The admirable orchestral contribution completes a memorable performance.

The recording too is remarkable. It is a natural mid-seat-in-the-stalls concert hall sound. Nothing exaggerated or ultra hi-fi, just a sound that one can sit back and enjoy so that the music comes over without any technical considerations intervening. Perhaps the sound does tend to harden a little in the last movement, but audience coughs are minimal, and only the turned up controls for the raucous applause at the end is regrettable. [A: 1] *Leon Thompson*

Essential Britten



BRITTEN: 'Phaedra', Op. 93—cantata □ **Prelude and Fugue for strings, Op. 29*** □ **'Sacred and Profane', Op. 91**—for unaccompanied voices □ **Four carols**
*Janet Baker (m-sop) | ECO | Bedford | *Wilbye Consort | Pears*
Decca SXL6847 (£3-50)

This is an important release, for with the exception of Op. 29 and one of the four carols, none of these items is otherwise available, and the two late works are recorded here for the first time. The performance of the Prelude and Fugue conducted by Britten dates from 1971—what else is still to come?—and the others were recorded within the past year at All Saints' Church, Petersham. *Phaedra* and the music for unaccompanied voices undoubtedly qualify for a recording star, the one on the strength of its all-round excellence, including some very positive stereo, the other for its immediacy and clarity. I think the string work also qualifies, though a small treble cut may be desirable.

Phaedra (1975) is one of the two major compositions from Britten's last years, the other being the String Quartet No. 3, which has yet to appear on record. Written for Janet Baker, this is a setting of Racine in an English verse translation by Robert Lowell and is said to have been modelled on the Handelian Italian cantata, hence the recitative-aria structure and the use of cello and harpsichord 'continuo'. There is great vitality here, and the climax of the *adagio* has a tragic grandeur that places it among Britten's noblest and most penetrating moments. The excellent performance receives a star. The eight medieval lyrics, *Sacred and Profane* (1975), are full of ingenuity and of problems for the singers, at times taxing even the virtuosity of the Wilbye Consort, for whom they were written. Again, nothing to suggest a sick composer, still less a dying one. The few passing blemishes are no barrier to a second star. Apart from *A Shepherd's Carol* (1944), the unaccompanied carols are very early (1929-31): *A Wealden Trio*, *Sweet was the Song* and *The Sycamore Tree*. Texts are provided. [A*: 1*/1] *Hugh Ottaway*

BRITTEN: 'A Hymn to the Virgin' □ 'Te Deum in C' □ 'Hymn to St. Cecilia' □ 'Hymn to St. Peter', Op. 56a □ Antiphon, Op. 56b □ 'Jubilate Deo' □ 'Hymn of St. Columba'
Choir of New College, Oxford | Lumsden Abbey LPB 753 (£2-79)

Noteworthy here is the declaration that, once the microphones had been placed, 'no additional electronic or other artificial devices were used at any stage of production'. The location was Worcester Cathedral, and the clarity and presence are in themselves of star quality; but there is a little tape-hiss, the organ is sometimes felt to be a shade over-prominent, and the boys' voices make very exacting tracking demands. Also there seems to be a bias towards the right-hand channel. Whatever weight may be given to these reservations, this is still an enjoyable record. The performances show a fine sense of style, a feeling for delicacy as well as zest, and the right sort of attention to detail. Occasional blemishes from the boys do little to mar the overall effect. But beware of possible edginess, and bear in mind that there is at least one alternative version of each item. Texts are not provided. [A/B: 1] *Hugh Ottaway*

Beautiful Bruch

BRUCH: Scottish Fantasy, Op. 46 □ Violin Concerto 2 in d, Op. 44
Itzhak Perlman (vln) | NPO | Lopez-Cobos
HMV ASD3310 (4) (£3-50)

Bruch's second concerto was once scorned, because it begins with an Adagio. That movement is warm, romantic; it is the finale which makes a weak effect. However, Perlman is an eloquent soloist, and Op. 44 makes a sensible coupling for a fine account of the *Scottish Fantasy*—a version to rank with Chung's magical Decca recording (SXL6573, with the Bruch *G-minor*).

Perlman is the more refined soloist, less all-out in manner than the Korean, whose musical personality seems to defy the limitations of the recording processes. She is certainly more 'war like' in the finale, but it is Perlman who makes you smile at his perceptive handling of the Scottish airs.



The balance is similar to the 1973 Bruch *G-minor*, with LSO/Previn, although there the orchestral quality was coarser. EMI's quadraphonic transfers have greater refinement, although here the NPO is reproduced rather cloudily. Using electrostatic headphones I found the sound rather beautiful, and adequately detailed, but with this producer, concertos always seem to present the soloist 'detached' from the orchestra's ambience. The RPO are given much more presence in Chung's coupling. HMV— [A: 1/1*] *Christopher Breunig*

BRUCKNER: 'Te Deum' □ VERDI: 'Te Deum'
Uta Sprechelsen (sop) | Heidin Ankersen (con) | Adalbert Kraus (ten) | Kurt Moll (bass) | Musikverein Choir, Bielefeld | Philharmonia Hungarica | Stephani Telefunken AWS.42037 (£3-50)

It was a very interesting idea to couple these two settings of the 'Te Deum', Bruckner's last-but-one and Verdi's very last liturgical composition, dating respectively from 1881 and 1898. If the differences are not surprisingly far more striking than the similarities, there are enough points of comparison to make the exercise perfectly valid. Bruckner's setting has been quite often recorded, most recently by Karajan (February this year); Verdi's, the last of his Four Sacred Pieces, has not appeared in recent years, though four versions survive in the current catalogue. I find the Verdi an uneven work (and at sixteen and a half minutes it makes a distinctly short side), though it is sung and played with a fervour and wide dynamic gradation that I find impressive. The Bruckner is given a very broad performance, indulgent here and there though less idiosyncratic than under Karajan; the soloists are unfamiliar, apart from Kurt Moll, but uncommonly good. The chorus sometimes loses rhythmic definition and would have appreciated some slightly faster tempi. All other considerations, alas, are eclipsed by the quality of the recording, which contrives to sound cavernous yet to lack depth and perspective, and even more alarmingly by the surfaces, which are noisy enough to

TOP TAPE

EUROPE'S CASSETTE AND TAPE SPECIALISTS

ALWAYS COMPETITIVE



01-486 8262



A most useful and versatile quality cassette. Available with an extra 6 minutes playing time on C60 and C90. Screwed case.

Super Ferro Dynamic (SM)

C66	£0-74
C96	£0-99
C120	£1-29



This Japanese cassette is of the highest quality and its introduction to the UK has been welcomed by cassette enthusiasts. It is likely to give truly excellent results on most modern recorders. Screwed case.

FX C60 Special C90 offer



Philips cassettes are made in both Austria and Holland, all have unique floating foil security to prevent tape jamming. Screwed case.

Low Noise

C60	£0-52
C90	£0-72
C120	£0-96

Super

C60	£0-67
C90	£0-83
C120	£1-12



This popular USA manufactured tape performs well on most cassette decks. Tests have shown that the formulation offers a well-balanced electrical performance with excellent mechanical performance. The case is welded rather than screwed.

MRX2

C30	£0-62
C45	£0-64
C60	£0-69
C90	£0-93
C120	£1-29

Chrome Dioxide

C60	£0-92
C90	£1-35

8-Track Cartridge

90 minutes	£1-44
--------------------	-------



Whilst a comparative newcomer in the UK it is a highly recommended Japanese cassette which constantly achieves excellent acclaim in technical assessment surveys. Screwed case.

Low Noise

C60	£0-62
C90	£0-79
C120	£1-04

Ultra Dynamic

C60	£1-14
C90	£1-29
C120	£1-76

Ultra Dynamic XLI

C60	£1-36
C90	£1-74

Ultra Dynamic XLII

(Chrome biasing)	
C60	£1-49
C90	£1-89



All Sony cassettes are tremendous value and have screwed cases with the exception of low noise C60s which are welded.

Low Noise

C60	£0-52
C90	£0-72
C120	£0-99

High Frequency

C60HF	£0-74
C90HF	£0-89
C120HF	£1-13

Chromium Dioxide

C60CR	£1-10
C90CR	£1-45

Ferro Chrome

C60FECR	£1-24
C90FECR	£1-72

Elcaset

LC60SLH	£3-65
LC60FECR	£4-79



Dynamic

C60	£0-55
C90	£0-75
C120	£1-02

Acoustic Dynamic

C60	£0-75
C90	£0-99
C120	£1-45

Super Avilyn (Chrome biasing)

C60	£1-03
C90	£1-39

REEL-TO-REEL

AGFA

PE36 5" L/P 900'	£1-85
5 1/2" L/P 1200'	£2-10
7" L/P 1800'	£3-05
10 1/2" L/P 4200' CINE	£7-95

PE46 5" D/P 1200'	£2-19
5 1/2" D/P 1800'	£3-09
7" D/P 2400'	£3-77

PE66 7" T/P 3600'	£4-75
PEM 368 7" L/P 1800'	£3-79

MEMOREX

7" L/P 1800'	£3-53
7" D/P 2400'	£4-55

SONY

SLH 7" L/P 1800'	£3-09
10 1/2" L/P 3600' NAB	£7-99
7" D/P 2400'	£4-89

MAXELL

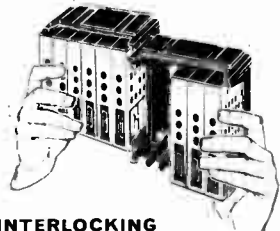
Ultra Dynamic	
7" L/P 1800'	£3-52
10" L/P 3600' NAB	£8-25

Back Coated UD	
7" L/P 1800'	£3-90
10" L/P 3600' NAB	£9-18

TDK

Audua	
7" L/P 1800'	£2-77

Back Treated Audua	
7" L/P 1800'	£3-25



INTERLOCKING CASSETTE RACK

Neat and compact, holds 6 cassettes secure. Links to other racks to build the ideal tape storage unit. Interlocks horizontally or vertically. Rec. Price 63p. **OUR PRICE 40p each.**



Colour Film from Wigmore Street and POST ONLY

PRINTS	
C110-20	£0-99
C126-20	£0-94
C135-20	£0-90
C135-36	£1-24

SLIDES	
KR135 20P	£2-10
KR135 36P	£3-10

MOVIE	
KMA 464P Super 8	£2-89

EXPORT



Tax free prices, plus carriage/insurance on request.



Prijzen vrij van invoerrechten, plus vracht, desgewenst verzekering.



Skattefria priser, plus frakt/försäkring på begäran.



Afgiftsfrie priser plus fragt/forsikring ved henvendelse.



Avgiftsfrie priser, plus frakt/forsikring ved henvendelse.



Prix hors taxe, plus transport/assurance sur demande.

ALL PRICES INCLUDE 8% VAT and correct as at 26/5/77. MAIL ORDERS TO (Dept. HN7), 33 Bridle Path, Watford, Herts WD2 4BZ. Postage (UK) 40p. per order. Over £30, POST FREE. Payment to TOP TAPE by cheque, postal order, cash (registered). CALLERS WELCOME AT KJ SHOWROOMS BELOW. Hours: Monday-Saturday 9.30-5.30; Late night Thursday 8p.m.

KJ 48, Wigmore Street
(Entrance in Welbeck Street)
LONDON W.1.
Tel: 01-486 8262
5 mins. from Oxford Circus

KJ 101, St. Albans Road
WATFORD
Tel: Watford 45250
2 mins. from Watford Junction Station

KJ 27, Springfield Road
HARROW
Tel: 01-863 8690
4 mins. from Harrow-on-the-Hill Station

KJ 278, High Street
UXBRIDGE
Tel: Uxbridge 33474
2 mins from Uxbridge Station

Opening SOON
53 Fleet, St. London EC4.

suggest a transatlantic telephone call during a storm. I hope Martin Stephani and his forces will be treated more kindly another time. [D: 2] Peter Branscombe

BUXTEHUDE: Complete Organ Works, Vol. 4
Michel Chapuis (org)
Telefunken 'Das Alte Werk' EK6.35309 (2 records)
 (£7-50)

This set completes the series, the organ used being the third example by Ahrend/Brunzema, this time at Aurich. As a reminder, organ specifications are given only in Vol. 1 (single disc), Vol. 2 contained music commentary and scores for Vols. 1 & 2, while Vols. 3 & 4 each have their own commentary and scores. As with previous issues, Vol. 4 can stand on its own if one wants only a reasonable cross-section of the composer's output.

Chapuis' treatment is again brusquely virtuosic, hard-driven, and making full use of manual-changing and of the instrument's well-blending tonal resources. The approach has its merits, but it seems to me that even if one neglects such issues as the liturgical implications of the chorales, this bland display of digital fireworks is insensitive, sometimes to the extent of undervaluing the basic musical structure.

There will be less argument about the recording. Apart from a tendency to a little brittleness in the extreme top, it is clear, immediate and forceful, with good transparency and without distracting background (though the dynamics favour the higher levels anyway). The balance is tipped towards the organ, clarity taking precedence over warmth. [A: 2] Trevor Attewell

CAJKOVSKIJ: Fourth String Quartet / JEZEK: Sonata for Two Violins / SCHULOFF: Sonata for Solo Violin

Sukovo Quartet: Antonin Novak and Vojtech Jouza (vlns) / Karel Rehak (vla) / Jan Stros (vlc)
Panton 11 0527F (£2-75) (Distributed by Rediffusion)

Since composers and performers on this record were all unknown to me when I received it, and since the sleeve-note is in Czech only, I approached it with total absence of expectation or preconception. This is a very good state of mind in which to listen, and I have emerged vastly impressed. The record is issued under the name of the lead violinist of the quartet, who certainly justifies it: he is a magnificent artist. I was able to extract from the notes that the solo sonata was written in 1927; and if the word 'avant-gadné' means what I think it does, it does not merit that title today. If you can take the Bartok sonata, or even the Bach *Chaconne*, you will revel in this. The double sonata comes under the same category: it was written in 1934.

But, as it seems to me, by far the finest work in the recital is the quartet. It is often monosyllabic, staccato and dissonant, with strong contrapuntal elements. Where it moves into melody, one senses a folk background and even glimpses the shade of Dvorak in the background. I found it deeply interesting and at times very moving.

The players are all in the first flight, both individually and as a quartet: one longs to hear more, and a more catholic programme. Since the recording is excellent, too, this is a new and highly valuable introduction. The mixing is perhaps a shade close; but that is a matter of taste. Frequently one has found these Czech and Hungarian issues rather ordinary; this one is quite different in every way: it expands the mind with a new experience, and that is something not to be missed. [A: 1] Peter Turner

Worthwhile Brass Bits

DIVERTIMENTO

Works by Previn, Howarth, Arnold, Bennett, Arban, Simon, Maurer and Tchaikovsky
Philips Jones Brass Ensemble
Argo ZK 851 (£3-50)

The Philip Jones Brass Ensemble can always be relied on to produce interesting records, exquisitely performed, and this one, from the quintet, is no exception. Most interesting is the imaginative *Four Outings for Brass Quintet* by André Previn, written for Philip Jones in 1975. This is dedicated to the group's tuba player, John Fletcher, and the first two *Outings* demonstrate the tuba's ability to play both skittishly and romantically. The work varies widely; the first movement has some scoring reminiscent of both Gershwin and Bernstein; the second is a blues with a distinctively Scottish aroma (and just a hint of Mike Gibbs) while the third and fourth are melancholy and lighthearted respectively. Fletcher's beautiful technique is also shown to advantage on an arrangement for four tubas, all himself, of Tchaikovsky's *Sleeping Beauty* waltz which must be heard to be believed.

Recorded in early '76, this was Elgar Howarth's last recording with the PJBE and apart from some dexterous cornet playing on an arrangement of an Arban study, he contributes a thoughtful work, *Pasce Tuos*, based on a chanson by Dufay. This starts with long unison held notes, played *piano* while the texture is slowly built up, very testing but well performed. The PJBE have recorded a Richard Rodney Bennett composition before, *Commedia IV* in 1975, and here include a mid-sixties fanfare of his, written for a series of PJBE schools concerts. Featuring some parallel-moving block chord work, it shows off the tight ensemble to be expected from such a long lived group.

Although all the tracks were recorded in St. Johns, Smith Square, the perspective changes from work to work, varying from quite close in a solo trombone fantasy by Malcolm Arnold, to quite distant in the *Pasce Tuos*, accentuating the mysterious sound picture created. A very worthwhile record, well-engineered, and here's to the next 25 years of the PJBE. (See also 'Gramophone', p. 99). [A: 1/1*] John Atkinson

DONIZETTI: 'Gemma di Vergy'

Caballé | Plishka | Lina | Quilico | Schola Cantorum (MD: Hugh Ross) | Opera Orchestra of New York | Queler
CBS 79303 (£8-99)

This was, if I count right, Donizetti's 48th opera, produced in Milan in 1834. By this time Donizetti had some of his best works like *L'Elisir d'Amore* behind him, so it can be counted as work of his maturity written in his 37th year. Owing to some delays over the libretto, Donizetti was forced to write the score in two months and the critics accused him, probably with some justification, of re-hashing old musical ideas. Give a dog a bad name and it tends to stick. Most later writers dismissed it as a failure. This, of course, the annotator of this present issue tries to refute just as any Donizetti enthusiast, like myself, is naturally reluctant to offer any words that might seem to discourage such an enterprising issue. In material terms, the opera was a considerable success. It was

played 26 times in its first season and for some years remained Donizetti's most popular work in Italy, performed there more than any other of his operas, including *Lucia*. It was performed in the world's opera houses, then in 1901, like so many bel canto works, disappeared from the stage to be revived for Caballé in Naples in 1975. Caballé followed this with performances in Barcelona and the present one at Carnegie Hall directed by Eve Queler in 1976. We had also received a foretaste from Caballé in her excellent recording of Donizetti 'Rarities' (RCA SER5591) in 1970.

To take a dispassionate view, I think it must be admitted that, in spite of its Victorian success, *Gemma di Vergy* is no dramatic masterpiece. It has one of those hysterical plots where people go overboard for very little reason and its characters all seem slightly mad. Much of the writing, as in so many hastily written Italian operas of the period, is dramatically unsuitable. Right from the start the characters sing of grief, disappointed love and languishing hopes to comparatively gay tunes and barrel-organ rhythms. Donizetti only seems to have got to grips with Gemma herself who gets all the gems and most of the drama. I can immediately counteract these conclusions by saying that the bel canto connoisseur will love the music and the opportunities for vocal display. It is packed full of excellent tunes and grateful writing for the voice. For *Gemma* Donizetti achieved some truly dramatic writing; there is a fine duet, for example, just before the wedding between Tamas (about to marry someone else) and the frustrated Gemma. Contrary to many Italian operas it also reserves one of its best arias for the finale.

This is a concert performance which may account for some lack of dramatic flow. I didn't find any of the male soloists particularly outstanding and at times they are positively wooden. But when Caballé is featured the whole thing comes to life. She is in splendid form, singing with great control and insight; rightly it is very much her piece, shining amidst subservient roles; some of her arias are quite ravishing. Eve Queler handles the score well in a nicely traditional way, not at all afraid of enjoying and even emphasising Donizetti's rhythmic impulse and emotional melodic line underlined with succulent harmonies. I hope I have been fairly and honestly critical of the piece without turning away any potential enthusiast. This is an operatic rarity which, once more, we must thank CBS for reviving. If you like Donizetti have no fears; you will love this and you will revel in the glory that is Caballé.

While solo voices are well caught, the orchestra is given somewhat boxy reproduction, and the chorus is nearly always swamped by everything else and almost lost at times. Rating for this issue must therefore account for many things without appearing too harsh. Caballé often deserves a star, but to give one would slightly over-rate a good but fluctuating performance. I therefore offer A/C with all that lies between for the recording and 1/2 for the performance which is often better than that, sometimes worse. I must append a personal hearty welcome to the issue. [A/C: 1/2] Peter Gammond

DVORAK: Symphony 9 in e, Op. 95 'From the New World'
RPO | Horenstein
RCA Gold Seal GL25060 (£2-49)

There is no clue as to the date of this recording, but from the sound of it I should put it somewhere near the end of Horenstein's career. Alfred Brendel has criticised record

companies for not publishing the dates of recordings, and I would support him. Surely there is nothing to be gained in keeping the information secret? Of course, one wonders, as I have wondered publicly more than once, whether there can be many more New Worlds for the conquering since they seem to come along almost every month. But there is always room for a good new version of a masterpiece, and any performance by Horenstein commands our attention. This is no exception, but I'm bound to say that it is a rather idiosyncratic account of the symphony with some exaggerated variations of rhythm and tempo. All of them, I am sure, designed to emphasise points that the conductor felt it necessary to impress upon us. Unhappily the result is disjointed, a sectionalised patchwork of episodes each intriguing, often exciting or tender, but somehow never quite sounding like the *New World* we all know. At least, it is not like any other performance of the symphony that I know. The RPO respond to directions apparently faithful to Horenstein's intentions and the recording engineers have caught the detail of the performance with creditable fidelity, a fact which only heightens the oddness of it all. If it sounds wholly bad, I should like to emphasise that I don't find it so; curious and intriguing rather. There is an unpleasant pitch wobble on the final chord. [B: 2] Kenneth Dommett

DVORAK: String Quartet in F, Op. 96 / HAYDN: String Quartet in D, Op. 64, No. 5 / SCHUBERT: Quartettsatz in c, D703
Panocha Quartet: Jiri Panocha and Pavel Zelfart (vlns) / Miroslav Sehnouška (vla) / Jaroslav Kulhan (vlc)
 Supraphon 1 11 1683 (£2-75)

These are astonishingly young musicians: we are told that their average age is 'not much higher than twenty'. It would be nice to be able to say that their performances astonish as much as their youth, but unfortunately they don't. They play very well, both as individuals and as an ensemble, but for some reason which is very hard to pin down the performances do not grip. They have, of course, with the 'American', the 'Lark' and the 'Quartet Movement' chosen a programme which has been well explored by generations of string players; but on the other hand it is one which one would have thought well suited to youthful freshness and vigour.

It happens that a day or so after receiving this record I heard a performance of the 'Quartettsatz' by the Chilingirian Quartet during one of those admirable live recitals from Pebble Mill. I also recorded it myself years ago as played by a University quartet. I could not but be struck by the utterly different impact: it is a matter of small but significant details of emphasis which are all related to a concept of the work as a whole: phrasing, dynamic, use of individual instruments, rubato—in a word, perhaps, maturity. The 'American' goes best, to my ears.

The recording does not altogether help: it is not wholly detailed, and there is an excessive prominence of the lead violin. I am sure there is great promise here, but with regret I cannot say more. [C: 3] Peter Turner

ELGAR: Caractacus, Op. 35—cantata
Sheila Armstrong (sop) / Robert Tear (ten) / Peter Glossop (bar) / Brian Rayner Cook (bass-bar) / Malcolm King (bass) / Richard Suart (bass) / RLPO and Choir / Groves
 HMV SLS998 ④ (2 records) (£7-25)

Another Elgar first recording! *Caractacus* was written in 1898; its opus number immediately precedes that of the *Enigma* Variations, and it is rich in hints of things to

come, especially the Variations and *Gerontius*. The musical personality is assured and, in a sense, fully formed, but it is that of the 'private "Birchwood" Elgar' who had not yet become 'the nation's Sir Edward'. As Michael Kennedy notes in his introduction, *Caractacus* was the first score that Elgar worked on at his beloved Birchwood, and the sense of personal happiness—present, not past—is warmly pervasive. The text is one of the poorest that he set, but there are moments when his dramatic response makes one regret that the next decade brought forth no opera from him. Musically, *Caractacus*, like *Sea Pictures*, is not without expressions that are 'twee', even trivial, in a way that confines them to their own time and place. For instance, the Druid maidens must surely have attended one of those Malvern finishing schools that Elgar knew as a peripatetic. The best things are in the orchestra, and after that in some of the solo parts.

If this performance had had as much vitality throughout as it has in the final scene, it would have been outstanding. Armstrong, Cook and King make excellent contributions; Glossop renders the title-role only partially sympathetic, and above the stage Tear tends to sound strained. There is much good orchestral work, but the chorus, as so often in such productions, might have been more incisive: in some of the quieter passages, the sopranos are limp and pallid. The recording is very successful, achieving a natural, concert-like presence, but with the soloists more comfortably focussed than that might suggest: clarity and warmth are nicely reconciled. The full text is provided. A very worthwhile venture. [A: 1/2] Hugh Ottaway

ELGAR: Coronation Ode, Op. 44 □ The Spirit of England, Op. 80
Teresa Cahill (sop) / Anne Collins (con) / Anthony Rolfe Johnson (ten) / Gwynne Howell (bass) / SNO & Chorus / Gibson
 RCA RL25074 (2 records) (£3-98)

Who would have thought that our Elgar mania would bring forth two recordings of the *Coronation Ode* in one month? The EMI version (ASD 3345—see *HFN/JRR*, June '77, p. 123) was the first to come for review, but RCA claim that theirs is the 'world première recording'. Much more important is the comparative quality, and here it must be said that neither in performance nor in recording is the RCA version to be preferred. The interpretation does not have the depth and dignity achieved by Philip Ledger and his forces (EMI), and the choral singing lacks the alertness and finish of the Cambridge University Musical Society. The vivid impact of the orchestra with fullness and breadth is clearly of A quality, despite an occasional touch of brashness and some shrill violin tone. But the choral sound, especially in the first and third sections of the work, tends to be generalized, and there are places where the soprano soloist seems unduly remote and somewhat pinched in tone.

The Spirit of England (Binyon) is the most considerable of the works of Elgar prompted directly by the first World War and deserves this revival. Of its three sections, 'To Women' is surely the best. The last, 'For the Fallen', begins promisingly, but the musical treatment of the third and fourth stanzas seems curiously makeshift. Nor does the famous fifth stanza bring any notable imaginative stroke. At times it is almost as if Elgar's feelings required a different text for their effective release, and it is striking that echoes from the private world of *The Starlight Express* appear more than once. An impressive performance. On my copy, and some others, the quiet con-

clusion is ruined by a short scratch—clearly visible at the end of side 4. (Examine before buying.) Otherwise, a superior recording. Full texts are provided. [A/B: 1/2]

Hugh Ottaway

Delightful English Recital



AN ALBUM OF ENGLISH SONGS: ARM-STRONG GIBBS: 'A Song of Shadows' / 'The Fields are full' / BENJAMIN BRITTEN: 'Winter Words' / GEOFFREY BUSH: 'Echo's lament for Narcissus' / 'The Wonder of Wonders' / IVORG URNEY: 'Under the greenwood tree' / 'Ploughman singing' / 'Nine of the clock' / GUSTAV HOLST: 'A little music' / 'The Thought' / 'The floral bandit' / ROGER QUILTER: 'Go lovely rose' / 'O Mistress mine' / PETER WARLOCK: 'To the memory of a great singer' / 'As ever I saw'
Ian Partridge (ten) / Jennifer Partridge (pno)
 Enigma VAR1027 (£3-49)

This album of English Songs covers a period from just after the end of the first world war until the present time. The principal work, Britten's 'Winter Words' is a contemporary masterpiece, and the occasions when he performed this partnered by Peter Pears were unique musical experiences. It is all the more gratifying therefore to listen to this beautiful performance by Ian and Jennifer Partridge. Ian's voice is at times uncannily reminiscent of Peter Pears in his best period and he has the same ability to produce a superb legato without sacrificing his diction. In this cycle and indeed throughout the whole recital he sings with great intelligence and deep feeling and he is now colouring his voice much more effectively. There are so many beautiful songs in this recital that it is impossible to mention them all, but I was delighted to see that two of Quilter's are included, despite the rather disparaging tone of the sleeve note which states 'Roger Quilter's songs are simply "A peg of words on which to hang a tune"'. If you can only sample a single item, I would suggest Geoffrey Bush's 'The Wonder of Wonders'. Ian Partridge handles this with superb technical command in the difficult coloratura passages, and it brings a delightful recital to an exciting conclusion. The recording and general presentation are excellent and I have no hesitation in giving the album a double star. [A*: 1*] John Freestone

FLOSMAN: Concerto No. 2 for Violin and Orchestra / **VALEK: Symphony No. 10 'Baroque'**
Andre Gertler (vln) | Prague RSO | Konvalinka* | Jiri Tomasek (vln) | Josef Ruzicka (pno) | Prague RSO | Valek*

Supraphon 1 10 1750 (£2-75)

Elsewhere recently I have written about Jiri Valek. This 10th (of his 11) symphonies further corroborates his versatility—and his establishment respectability. Here we have a 5 movement double concerto for piano and violin. It is an attractive piece with a wide variety of texture and sound. It ranges from the explosive start (orchestra dominated with fugitive solo parts) through a quasi military middle movement, to a last one redolent of the "big" Hollywood movie! Oldrich Flosman (b. 1925) belongs to the same generation. Judged by this violin concerto he is technically less brilliant but seems a more thoughtful, probing composer. The concerto *does* end triumphantly, but its triumph is hard won—forced to be born out of a dark-hued soulful work which reminds me (in feeling, not in any sense of imitation) of William Walton's *1st Symphony*. The first movement (sonata structured) is slow, searching music. This is followed by a sarcastic scherzo and the final—and longest—movement is conceived as a large-scale fugue inside which the solo violin struggles with the thematic material in a sort of cadenza. A memorable work played with fiery conviction by Andre Gertler, its dedicatee. [A: 1] *Benedict Sarnaker*

GUIARRA ESPANOLA

Diego Blanco (gtr)

Swedish Society SLT33205 (£3-75) (Distributed by Rediffusion)

The composers represented here are, naturally enough, all well known: Turina, Torroba, Albeniz, de Falla, Sor, Tarrega, Pipo. However, Blanco in general avoids the warhorses, though—presumably in order to establish his relationship to other performers—he does include a few, notably Tarrega's *Recuerdos de la Alhambra*.

Technically, Blanco need fear little competition: in particular, his runs and trills are superb. In the Tarrega piece mentioned above, the melody is played *tremolo* throughout, and there cannot be many performers who can sustain the rhythm with the staggering regularity which Blanco achieves here. However, music means more than that: borrowing the terminology of photography, there is the macrocontrast of a whole work or movement, and the microcontrast of each phrase and indeed note. It is this subtle use of phrasing, dynamic, rubato and contrast which distinguishes the great musician from lesser folk; and it is here, I feel, that Diego Blanco has something to learn—from, for example, the great Bream, whose pre-eminence over all other guitarists seems to me to derive from his mastery of micro-contrast.

That said, it must be added that there is so much to admire here that the record is a worthy addition to any collection. The recording is of a very high standard, as in the Bach record reviewed elsewhere in this issue. [A: 2] *Peter Turner*

HANDEL: Coronation Anthems

Huddersfield Choral Society | Northern Sinfonia | Pritchard

Enigma VAR1030 (£3-49)

Not only the famous *Zadok the Priest* but the other three anthems composed by Handel for the coronation of George II in 1727 are to be heard here. With commendable speed the record was on sale less than a month after the recording session in Huddersfield Town

Hall, and only a single wrong double-bass entry suggests that the session itself may have been a little rushed.

But I do not care much for the result, either musically or as sound. *Zadok* begins with a long orchestral build-up which it is almost inconceivable for a conductor not to treat *crescendo* just before the chorus enters. Here, on the contrary, there is a deliberate retraction of sound which I am tempted to blame on the engineers rather than on John Pritchard. The whole record suffers because an apparently large chorus with a smooth and heavy style simply does not match the crisp but rather dry playing of the small chamber orchestra playing in front of it.

The words are all but indistinguishable, though a few (not complete texts) are given on the sleeve. The anthem *My heart is inditing* ought to have soloists, but does not. Handel is not really to be served in this manner today. [C: 3] *Arthur Jacobs*

HARRIS: Symphony 5 / MARTINU: Symphony 5
Louisville Orchestra | Whitney
RCA 'Gold Seal' GL25058 (£2-49)

The association of these two more or less contemporaneous fifth symphonies is interesting. Roy Harris's was written in 1943 and revised in 1945 while Martinu's belongs to 1946. The relatively small output of the American composer is matched by a comparable dryness of utterance and an abiding intensity that is reflected in almost everything he has written, whereas the fecund Czech emigré pours into his music a lyrical exuberance that occasionally suggests a lack of discipline, certainly of the kind of stern self-searching to be found in the Harris symphony. Not that this is a dry or a didactic work; anyone who knows the Third Symphony, most famous of all the composer's work, will recognise in the fifth those same qualities of direct, honest concentration. Harris's music has been sorely neglected of late and it is a pleasure to have a major work from him and one that has not been recorded before. Perhaps as a token of his astringency the composer has given the first two movements no more indication than the metronome beat: 66 for the first and 46 for the second. The third and last movement is marked 'Appassionato b = 72', a slight concession to an implied emotion that is kept strongly in check by the composer and honoured by the conductor. Martinu's symphony makes use of a clearly defined rhythmic motif and uses orchestral colour lavishly. Its tone is eclectic, however, whereas Harris' cannot be mistaken for anything other than American, and is typical of many of the Martinu's orchestral works written towards the end of his exile in America. And it is not consistently successful, the play of rhythm patterns becomes almost an end in itself and lacks the pungency of Stravinsky's use of the same technique. The recording on this side sounds much older than that of the Harris and much of Martinu's luxuriant detail is lost in a general muzziness. Some time ago there were rumours of a complete set of the Martinu symphonies from Supraphon which one hopes will soon arrive. Meanwhile this impaired but imaginative issue must serve as our introduction to two very worthwhile symphonies by composers who have still not had their full quota of recognition. [B: 1] *Kenneth Dommelt*

HAYDN: Piano Trios: 7 in D □ 9 in A □ 12 in e
Beaux Arts Trio
Philips 9500 326 (£3-50)

This estimable series moves on apace after a gap a year or two back that had some of us

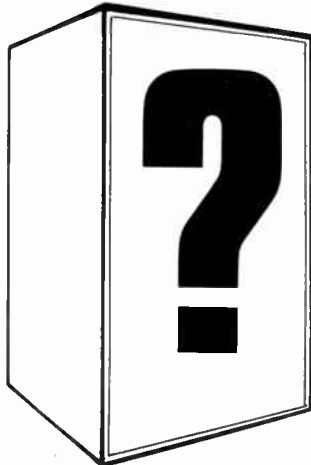
growing restive; now we welcome the third new disc in eight months, and at this rate it will not be long before another superb Haydn 'first' is achieved. Who but the most ardent connoisseur of the trios would have guessed just a few years ago how eagerly each new record in this series is awaited, how warmly it is cherished? If the numbering suggests that these are early, and perhaps trivial, pieces, let me hasten to disabuse you: they all date from the middle or late 1780s, are all musically rich, varied, rewarding (though the cellist might think his own part anything but rewarding, he never allows a hint of any private doubts he might hold). As in previous issues, the balance is allowed to favour the piano, quite rightly so, but the violin, and where appropriate the cello, make their own contributions directly and with perfect style. The excellence of the music was appreciated by Haydn's contemporaries, who evidently flocked to buy these works in all sorts of editions; we can be sure they seldom if ever fared so well at the hands of their performers as they do here. The recording has immediacy and a superbly limpid quality. [A: 1] *Peter Branscombe*

Recommended Hindemith et al.



HINDEMITH: Kleine Kammermusik, Op. 24: 2 / IBERT: Trois Pièces Brèves / JANACEK: Mladi / LIGETI: Ten Piece for Wind Quintet
Vienna Wind Soloists
Decca 'Ace of Diamonds' SDD 523 (£2-50)

This is an enterprising anthology of modern wind music into which the Ligeti pieces fit rather better than one might have expected. Apart from one ear-piercing item which consists of over-blown notes played fortissimo and held until the eyes begin to run, they are pleasant miniatures in what is now the composer's familiar style. For the rest only Janacek's strange but compelling *Youth*, here given a very finely detailed performance, has attracted many recordings including a good one from the Foerster Wind Quintet and another, now deleted, by the Melos. Hindemith's wiry quintet of 1922 is represented by one other, now elderly recording, as is Ibert's perky trio of pieces. This then offers not only a well-planned programme of contrasting pieces, but presents works not excessively recorded and in performances that in the main outshine their rivals. Technically the recording lives up to the promise of its programme and this issue can be confidently recommended. [A: 1/1*] *Kenneth Dommelt*



ALL the best loudspeaker systems available—under one roof. We do not just recommend the speakers illustrated, good as they may be—we like our Customers to listen to the speakers that interest them and to decide for themselves. To do this we supply comfortable uninterrupted demonstrations which must be booked in advance (weekdays only).

We have 40 pairs of speakers on permanent demonstration and we will set up any others we have in stock, if required—your ears then take over from the Reviewers recommendations and you can then decide which speakers you prefer. It is the only way—after all, you have to live with them.

Top Demonstrations

Hourly appointments can be booked for uninterrupted listening — over 30 pairs of speakers and 20 different cartridges through top quality amplifiers and receivers.

EXPORT

Personal shoppers can take advantage of our 'over the counter' export scheme. We also ship directly abroad, contact us for tax free price quotes and delivery costs to anywhere in the world.

Service

Cassette Deck alignment for chosen tape—prompt service. Tuners aligned and serviced, plus comprehensive after sales service and repairs.



Credit facilities available to personal callers.

We give extended guarantees on all equipment purchased at manufacturers retail prices

Phone for our Competitive Prices — available on most makes of equipment.

Exportations en France notre spécialité.

Waren werden steuerfrei exportiert oder wenn man England besucht, können wir spezielle Pläne für eine Steuerzurückforderung vorschlagen.

Audio T

The Audio Consultants

190 West End Lane
London NW6 1SQ
Tel. 01-794 7848.

Mon Wed 11-6 Thurs Fri 11-7 Sat 10-5

HINDEMITH: String Quartet 2, Op. 16 □ **String Quartet 3, Op. 22**
Kreuzberger String Quartet
Telefunken 6.42077 AW (£3-50)

Of Hindemith's six surviving quartets only the Third (Op. 22) seems to retain much of a hold on the repertoire. It is easy to regret the apparent neglect of a favoured composer's work, but Hindemith's quartets stem from an intimate knowledge of the medium. They are virtuoso works, grateful to the players, formally interesting and their neglect seems to be due rather to the ignorance of modern players than to any intrinsic shortcomings in the music. The arrival of this new recording does something to redress the balance, though there is already one other, very good recording of Op. 22 by the Fine Arts Quartet. Both the present works belong to the period of Hindemith's membership of the European avant-garde; Op. 16 was written in 1920, Op. 22 in 1922. But in retrospect neither seems particularly revolutionary except in their use of aggressive rhythms and their adaptation of Bach's (and Reger's) use of counterpoint which was to become a feature of Hindemith's music of the late twenties and thirties. Unfortunately, the Kreuzberger Quartet are not as faithful to the scores as they might be. There are significant deviations in both tempo and dynamics from Hindemith's wishes, especially in Op. 22. There is rarely a real pianissimo, and, on occasion, where directed to return to the original tempo the direction is ignored. Technically, however, the players are well up to the severe demands made on them. The recording, like several recent German products, is very forward and very powerful, and this may have something to do with the dynamic levels. Despite these defects the record must be welcomed as its virtues far outweigh its shortcomings. [A: 2]

Kenneth Dommett

Splendid Fusion collection

IMPROVISATIONS

Yehudi Menuhin (vln) | Ravi Shankar (sitar) | Jean-Pierre Rampal (fte) | Martine Géliot (hp) | Alla Rakha (tabla) | Nody Mullick, Kamala, Amiya Dasgupta (tanpuras)
HMV ASD3357 (£3-50)

In 1951, Yehudi Menuhin visited India, where he became enchanted by the music he heard, and also initiated a close friendship and collaboration with the great sitar virtuoso, Ravi Shankar, which has enabled each to explore the musical tradition of the other's culture. This recital is the fruit of that collaboration.

It consists of four compositions by Shankar, each based upon a traditional *Raga*, and retaining the improvisational element which is an essential feature of Indian music. The *Raga* provides the melodic basis of the work, to which must be added the *Tala*, or rhythmic element—frequently of daunting complexity to Western ears. With time, one comes to yield to the spell of this extraordinarily flexible and expressive music. There are *Ragas* for times of the day, seasons of the year, emotional moods; and the virtuosity of the great performers is breathtaking.

The pieces here are: 'Tenderness', for violin, sitar, tabla and tanpuras; 'Twilight Mood' for the same combination; 'The Enchanted Dawn' for flute and harp—the harp roughly taking the place of the sitar;

'Morning Love' for flute, sitar, tabla and tanpura. There are, inevitably, concessions to Western tonality, and there must be a degree of pastiche about such experiments; but this is by far the most satisfying attempt at traditional fusion which has come my way: it is fascinatingly interesting, very moving, and inviting of days of structural examination. Chamber-music explorers should not miss this safari.

The recording is excellent: clear, detailed, natural. This is a splendid issue. [A: 1/1*]
 Peter Turner

LEONI: 'L'Oracolo' □ Reminiscences from the incidental music to 'The Prayer of the Sword'
Sutherland | Ryland Davies | Gobbi | Van Allan | Tourangeau | Grant | National Phil | Bonyng
Decca D34D2 (£7-50)

What opera begins with three kettledrum-strokes, a cock crowing, and the words 'Wufet: tanhae fulu'? These words are supposedly Chinese, and the opera is *L'Oracolo* by Franco Leoni (1864-1937). It is in one longish act (three sides). The libretto, based on an American novel, is set in San Francisco's Chinatown. To Tito Gobbi falls the role of the keeper of an opium-den who turns murderer, and is himself killed in a grisly scene of vengeance which recalls the end of *Il Tabarro*. The style is indeed kin to Puccini's in that work, but Leoni got there first: *L'Oracolo* was first given in 1905 (at Covent Garden); *Il Tabarro* dates from 1918. It is a powerful piece of its kind, well-deserving the prestige of a Bonyng/Sutherland recording. Not for the first time I am grateful to Richard Bonyng's lively initiative.

It is no 'prima donna's opera', though, and Sutherland is to be praised for firm, smooth lustrous singing in the total ensemble. Gobbi sometimes slightly forces the voice, but is still impressive. The best role in the opera, however, is that of the 'oracle' (a local sage) himself, Win-Shee, and Richard Van Allan commands it splendidly. Perhaps a more bass, less baritone quality would have been even better for contrast on record with Gobbi.

The voices, in this recording, are somewhat artificially detached from the orchestra: the result does not really suggest a theatre sound, but on its own terms it provides a clear and agreeable perspective. Within it the National Philharmonic Orchestra (a genuine organisation, not a pseudonym) plays splendidly for Bonyng, both in the opera and in the superior Hollywood-ish theatre music on side 4. The whole set may be welcomed both as a 'first on record' and for its superior quality. [A: 1]
 Arthur Jacobs

LISZT/BUSONI: Fantasy and Fugue on the Chorale 'Ad nos, ed salutarem undam' / REUBKE: Piano sonata in b
Hamish Milne (pno)
Oiseau-Lyre DSLO21 (£3-50)

Julius Reubke, a favourite pupil of Liszt, died in 1858 at the tragically early age of 24, leaving only two major works, a sonata for piano, recorded here, and one for organ, a remarkably mature work for so young a man, which has received a good deal more attention than its companion. The piano sonata derives quite clearly from Liszt's great B minor sonata for the same instrument, and is dedicated 'To my deeply revered teacher Franz Liszt'. It is a romantic and sonorous work well worth more hearings than it receives, and this, the only current recording, is welcome. The performance by Hamish Milne is a good one.

The second side of the disc is occupied by Busoni's free transcription for piano of Liszt's first composition for organ—the transcriber transcribed! Busoni's work is at least as

effective as the original, and not less convincing.

The recording is a good one, rich and full in tone, especially in the bass, with only occasional hardness in the upper register in *fortissimo* passages. The extent to which this is apparent will depend on the pickup used. [A: 1]
 B. J. Webb

LOCKE: Incidental Music to 'The Tempest' □ Music for His Majesty's Sackbuts and Cornetts
The Academy of Ancient Music | Hogwood
Oiseau-Lyre DSLO507 (£3-50)

This is a most interesting recording, bringing together all the existing music Matthew Locke composed for the 1674 production of Shakespeare's play. Even by this time, it had undergone many adaptations by Davenant and Dryden in 1667 who modified the play to restoration taste. Locke's music includes not only his own original material, but also some music by other composers—Humfrey, Reggio, Banister and Hart, some of which appeared in the earlier restoration version. The score includes both instrumental and vocal numbers, but Locke's own music dominates the proceedings in its originality, lively rhythms and striking dramatic contrasts. The 1674 production was evidently a lavish affair, presented at the new Duke's Theatre, and quickly became something of a hit, making more money for the management than any previous production.

In many ways, this is an impressive record: the orchestral work reflects Mr Hogwood's careful direction, and the singers—who include Judith Nelson, Emma Kirkby, Martyn Hill, John York Skinner and Geoffrey Shaw—give a splendid performance. The rich continuo sound is enhanced by placing the two harpsichords and two theorbos on either side of the sound stage.

I am less happy with the *Music for His Majesty's Sackbuts and Cornetts*, which—although one admires the performance—only seems to make me thankful that we now have trombones and trumpets. But this work takes up only a small part of an otherwise excellent record, which can be heartily recommended in terms of its performance and clean, realistic sound. [A*: 1/2]
 Colin Evans

MASSENET: 'Le sais-tu?' □ 'On dit!' □ 'Passionnement' □ 'L'âme des fleurs' □ 'Pensée d'Automne' □ 'Souvenance' □ 'Le petit Jésus' □ 'Les yeux clos' □ 'Ce que disent les cloches' □ 'La mélodie des baisers' □ 'Pitchounette' □ 'Nuit d'Espagne' □ 'L'Eventail' □ 'Je t'aime' □ 'Les amoureuses sont des folles' □ 'Printemps dernier' □ 'Roses d'octobre' □ 'Sérénade d'automne' □ 'Souhait' □ 'Elle s'en est allée'
Huguette Tourangeau (m-sop) | Richard Bonyng (pno) | Reginald Kilbey (cello)
Decca SXL 6765 (£3-50)

Massenet wrote over two hundred and fifty songs during his long life and they were extremely popular in his day. Most of them were written to rather mediocre poems and it is significant that among this selection there are no settings of Verlaine, Baudelaire or almost any of the great French poets of the period. Some of the songs were dedicated to well known singers and they were no doubt immense favourites in the fashionable salons of the time. They are full of charming melodies and the accompaniments are varied and well suited to the eminently singable vocal line.

Miss Tourangeau who has made significant contributions to the recorded repertoire, particularly in her operatic recital on Decca SXL 6501 sings with good tone and reveals a voice of wide range and considerable power.

This is the safest place in the world to play your records.

We believe you should have as little as possible to do with the ADC Accutrac 4000.

So once you've placed your record on the turntable, and pressed a few buttons, you can leave the rest to the world's first computerised turntable.

The human errors that do a lot of damage to records are a thing of the past.

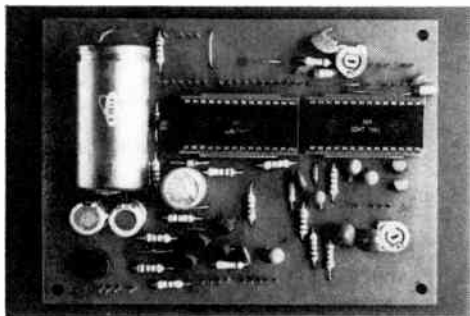
You get more out of it, because we put less into it.

It's a fact that when you compare the ADC Accutrac to other expensive turntables, the rest are made to look clumsy, complex and old-fashioned.

Truly superb sound reproduction can now be achieved in a much simpler way.

The turntable with a memory.

We started by replacing a lot of noisy mechanics with a neat little computer.



Out came standard components.

In went the latest breakthrough in MOS computer circuitry.

So all Accutrac's operations are controlled and programmed far more quickly and efficiently than any other automatic turntable.

The control panel is designed for you to select up to 13 tracks in any order you want to hear them, and a 24 selection memory bank allows for programmed repeats.

The motor that keeps an eye on itself.

We replaced the conventional belts, wheels and pulleys with an electronically controlled direct drive system that keeps wow and flutter to a completely inaudible .03% and rumble at -70dB.

The motor contains electronic speed-sensing circuits, which keep a constant eye on the accuracy of the massive 12 inch diecast turntable's speed, and instantly corrects any error.

There's also a speed tuning circuit that lets you vary the speed over 5%.

A glance through the stroboscope provides a reliable speed check.

The tonearm you never touch.

We did some more eliminating.

Out went the noisy linkages that power automatic arms from the main turntable drive



motor.

Out went velocity-sensing mechanical arm-trip mechanisms.

Out went all the clumsy cams and gears.

Instead, Accutrac's tonearm is moved by its own electro-optically controlled servo-motor.

It responds instantly and silently to your programme in the turntable's memory bank. Tracking error is minimised by the arm's 9 1/3 inch (237mm) effective length, and horizontal and vertical bearing friction has been reduced to the negligible level of 5-7mg, due to Accutrac's new ball race and pivot system. From the instant the stylus touches the record, the arm is totally decoupled from the servo-motor and controls, so it always tracks the groove with perfect freedom.

The cartridge that knows where it's going.

Accutrac has the most advanced cartridge in the world.

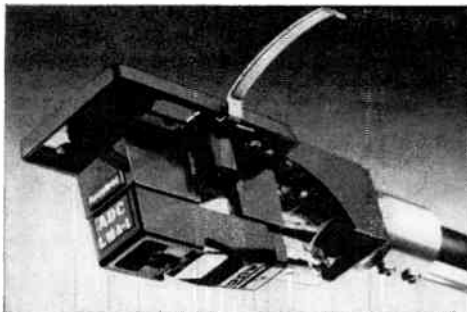
The ADC LMA-1.

It scans the surface of the record with a tiny beam of light from a solid-state infra-red generator.

When the beam is focused on the record, closely spaced grooves scatter the light, while the smooth surface between the tracks reflects the light back to a detector which triggers the arm mechanism.

This system ensures that the tonearm selects the right track quickly and smoothly, while accurately gauging where it begins and ends. The low mass cartridge with its elliptical stylus, features the *Induced Magnet* system on which ADC built its enviable reputation.

It combines a strong, accurate, signal output with a 3/4 to 1 1/2 gram tracking ability.



The integrated design of the tonearm and cartridge results in minimal arm mass and an ideal tonearm resonance between 8-10Hz.

It's all at your command.

As you see, Accutrac has some very intriguing features, quite apart from the turntable.



What looks like a pocket calculator

is actually a cordless command module.

So you have remote control.

The sculptured space-age object is the receiver for the turntable's memory bank. It's 'winking eye' tells you that your commands have been received.

Then you just sit back and enjoy what we hope you'll agree is the main attraction: the sheer excellence of the sound reproduction.



Distributed by BSR Limited,
Powke Lane, Cradley Heath,
Warley, West Midlands
B64 5QH.

Accutrac 4000™

Guaranteed for 2 years.

In the faster songs like 'Pitchouette' she is at her very best, but in the slower ones she is inclined to use too much portamento and so the songs become sentimentalised as for example in 'Pensée d'automne' and 'Souhait'. The accompaniments are brilliantly played by Richard Bonynge with the co-operation in certain cases of Reginald Kilbey, and the recording is good but occasionally over resonant as if the artists were in a large empty hall.

The sleeve notes give the names of the various poets set by Massenet, and also mention the names of the artists to whom certain songs were dedicated. For the sake of accuracy it should be mentioned that Marie Delna was not the first 'Charlotte' in 'Werther' as stated. The role was created by Marie Renard in Vienna in 1892. [A: 1/2]

John Freestone

OFFENBACH: 'La Grande Duchesse de Gerolstein'—highlights
Zareska | Prevot | Dran | etc | Choeur Lyrique de Paris | L'Orchestre des Concerts Pasdeloup | Leibowitz
Saga T 5446 (£1-50)

These highlights from Offenbach's *Duchesse* must now compete with the complete operetta on CBS (79207). This issue is not entirely déjà-vu as the record has been re-cut and the selection expanded. There is now a remarkable 73 minutes playing time (as compared to 117 minutes on the 2-record CBS set). The sound, kept at a lowish level, is not all at bad and quite clear. We have praised the lively performance before, directed in lively manner by Rene Leibowitz. The cast is not as distinguished as the CBS one but compares very favourably. While there is perhaps no question that the CBS version is the one to have (complete and well recorded) this highlights disc is a really tempting proposition at a bargain price. [B/C: 1] Peter Gammond

CRISTINA ORTIZ PLAYS PROKOFIEV
Highlights from the ballets *Cinderella* and *Romeo and Juliet* transcribed by the composer
Cristina Ortiz (pno)
HMV HQS 1393 (£2-50)

The release of this disc coincides with the publication of our interview with the artist, Cristina Ortiz. (See p. 97.)

Prokofiev, a complex character was himself a brilliant pianist and wrote a great deal of music for the instrument, some of which, (e.g. the 3rd Concerto) has become increasingly popular over the years since his death. These transcriptions carry the stamp of authority, since he made them himself, in order to extend the availability of his work and extend interest in it. Much of his writing does not even today fall comfortably on the listening ear at first acquaintance; it is too percussive, 'spiky' and angular, devoid of what may be described as 'extra-musical' appeal. Significantly, he was not among those Soviet composers who, in 1948, declared themselves willing to write simple, tuneful music for the 'common man'; there, indeed he was in good company, but his strong rhythmic patterns and stringent harmonies are frequently exciting and exhilarating.

The ballets *Cinderella* and *Romeo and Juliet* are among Prokofiev's more immediately appealing works, fresh, lively and expressive. *Romeo and Juliet*, in its original form must rank among the greatest of ballet scores. Prokofiev transcribed 10 numbers from it for pianoforte in 1935 and performed them himself in Moscow a year before their publication in 1938. They do not figure frequently in recital programmes in this country, but they are highly effective and retain the qualities which

have been mentioned. The 13 transcriptions from *Cinderella* are quite different in character from their fairy-tale atmosphere of lightness and fantasy.

Cristina Ortiz, one of the outstanding members of the younger generation of pianists has made previous excellent records of Russian (and other) music for E.M.I.: the two Shostakovich Concertos (ASD 3081) and the Rachmaninov Paganini Rhapsody (ASD 3197). She realises the varying moods of these ballet transcriptions admirably, and the recording is very good, natural in tone and with sufficient but not excessive ambience. The record is a welcome addition to the catalogue, and on plum label represents excellent value. The cover bears a portrait of Miss Ortiz done during the recording sessions by the composer's son, Oleg Prokofiev. [A: 1]

B. J. Webb

PATTERSON: Kyrie* □ Gloria* □ Trilogy for Organ □ Visions □ Fluorescences
The London Chorale | Wales* | Wills (org)
HMV CSD 3780 (£3-35)

As a contribution to our Silver Jubilee celebrations, HMV have issued a number of recordings of music by living British composers. The time is opportune and the gesture right (though I can't resist expressing the wish that our living composers should be treated to wide public hearing as a matter of course and not only of celebration). Paul Patterson—at 30—is a bright, talented light. He is technically fluent and (and this is important at present) easily accessible both to performers and to audiences. The *Kyrie* and *Gloria* (companion pieces written for the present performers) are replete with modern choral devices which Patterson uses with great skill to generate a variety of moods: joyful, silly, violent, slow and mysteriously gentle. The debt to modern Polish music (Lutoslawski; Penderecki) is clearly here, but hardly to be decried for breeding such vitality.

Side 2 is a feast for organ lovers (with suitable speakers and very large rooms). The *Trilogy* (Intrada; Interludium—a quieter, thoughtful piece; Jubilate) shows the organ at an extreme of vigour, but a vigour free from self-indulgence. *Visions* (1971) was written for Malcolm Williamson—it is the most complex piece here and most deserves repeated listening. The record ends with an exuberant display piece, the toccata *Fluorescences*. All in all, a handsome record filled with aural pleasures and boding well for the future. The choral works are exuberantly directed by Roy Wales and Dr Arthur Wills, playing the organ of Westminster Cathedral, produces power, delicacy and structural strength to do the organ pieces justice. [A: 1] Benedict Sarnaker

RACHMANINOV: Piano Concerto 3 in d, Op. 30
Lazar Berman (pno) | LSO | Abbado
CBS 76597 (£3-49)

Berman reintroduced himself to a London audience with this work, last season. The sessions, under Steve Epstein (also responsible for Berman's Beethoven sonata coupling on CBS), took place at the Henry Wood Hall, where Berman's amiability and untiring enthusiasm impressed journalists.

As might be expected, he plays Rachmaninov's concerto *con amore*, making the long opening movement in particular seem improvisatory, warmly spontaneous. Abbado proves an excellent foil, bringing cool precision and clarity to the orchestral part. There is neither melancholy nor aloofness here—even the pivotal phrase in the finale (59, before the *Tempo I*) is romanticised, its pain removed. Even so, Berman's playing is marvellous, notably in the introspective passages.

However, I cannot help feeling we only have half the story, because the recording offers unreal timbres, and perspectives that are anomalous, by concert-hall standards. At times the piano is recessed, at others it is clanging and spread too wide; focus is best at the beginning of side 2. This is a record that requires playback at a high level for the balancing anomalies to diminish, but the overall quality seems very compressed and frequency limited. The production team have been so enthusiastic about pulling this or that out of the score that the real dynamic contrasts of this performance have become obscured. Thus the Russian versions on HMV (both Mogilevsky and Gavrilov are cheaper) offer better value, but Berman fans need not hesitate. [B/C: 1] Christopher Breunig

RACHMANINOV: Piano transcriptions, etc.
Garrick Ohlsson (pno)
HMV HQS1374 (£2-50)

A programme of fifteen items, mostly to be found in the first two RCA albums of Rachmaninov's own recordings, including transcriptions of Kreisler, Bach, Bizet, Mendelssohn (*MND scherzo*), and Rimsky-Korsakov ('Flight of the Bumblebee'). But Ohlsson also adds a Rachmaninov Prelude (Op. posth.), *Fragments*, and the 1940 revised versions of *Melodie* and *Humoresque*.

The record begins unpromisingly, with a studious account of the Mendelssohn scherzo, perfectly neat, but missing the mercurial and rumbustious elements that Moiseiwitsch defined so well on 78s. Nor is Ohlsson's *L'Arlésienne* Minuet as atmospheric, as light in touch, or rhythmically fluid as Rachmaninov's 1922 version. In fact, this proves to be not the 'fun' record one had anticipated; Ohlsson is too serious for that—although he seems to enjoy the music, and his playing is clean and thoughtfully prepared. A dedicated approach, rather than pianistic wizardry.

EMI's sound is clean, too, but the top is rather dead. A less impressive piano recording than the recent Alexeev Brahms recital on this label, and in SQ. Still, I won't qualify the A rating. [A: 2] Christopher Breunig

RACHMANINOV: Piano Concerto No. 3
Joseph Alfidi (pno) | Belgian National Orchestra | Rene Defossez
Heliodor 2548 262 (£1-35)

The pianist, Joseph Alfidi, a citizen of the USA, won the third prize at the Queen Elizabeth of Belgium International Competition in 1972. This live performance was presumably made at that time. The soloist, rather than the orchestra fails to convey the half light mood significant of the works of Rachmaninov, for often when he bursts in one is reminded of a rather extravert performance of Tchaikovsky's Piano Concerto No. 1. Actually he starts off encouragingly at an attractive pace somewhat faster than is generally accepted, but then he begins to rush things and the mood is lost, and apart from the end of the 1st movement it rarely returns.

The recording at times is good, but at climactic points the sound hardens, resolution suffers and the piano jangles. The recording may well add to the adverse impression created of the performance. Also there are far too many audience coughs in the first movement, and the work concludes with wholly undesirable ear-splitting applause.

There are several mid-priced versions of this Concerto available, but I would recommend the use of a piggy bank until one could invest in one of the last top priced versions by Ashkenazy or the Larrocha performance. [A/C: 1/3] Leon Thompson

THE SOURCE of perfection in stereo sound... Pickering's all new XSV/3000



It features a totally unique construction (developed by Pickering through our pioneering in discrete, 4-channel) plus a totally new stylus tip shape, the Stereohedron™, which has superior tracing ability and assures longer stylus and record life!

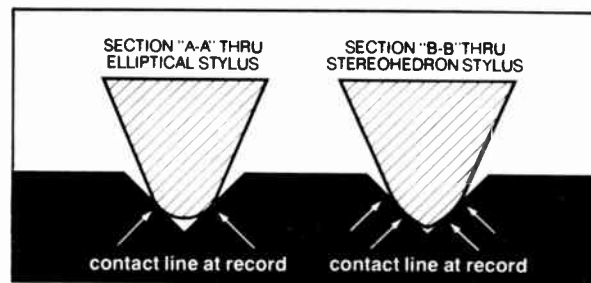
This new cartridge makes possible a wider, more open, finer sound — because it maximizes stereo tracing capabilities with the slightest, lightest touch a record ever had. It increases record life because force is spread over a greater contact area. And that means the least record wear achievable in these times (with a stereo cartridge).



"for those who can hear the difference"

PICKERING & CO., INC., P.O. Box 82, 1096 Cully, Switzerland
United Kingdom Highgate Acoustics, 38 Jamestown Road — London NW1 7EJ — Tel. 01-267 4938

Austria Boyd & Haas, Rupertusplatz 3 — 1170 Wien — Tel. 4627015
Belgium-Luxembourg Ets. N. Blomhof, rue Brogniez 172a — 1070 Bruxelles — Tel. 522 1813
Denmark Audioscan, Ryesgade 106a — 2100 Copenhagen Ø — Tel. (01) 768000
Finland Oy Sound Center Inc., Museokatu 8 — Helsinki 10 — Tel. 440301
France Magéco Electronic, 119, rue du Dessous des Berges — 75013 Paris — Tel. 583 6519
Germany C. Melchers & Co., Schlachte 39-40 — 2800 Bremen — Tel. 0421/3169323
Greece B. & C. Panayotidis S.A., 3, Paparrigopoulou — Athens — Tel. 234 529
Iceland E. Farestveit & Co. H.S., Bergstadastreiti 10 — Reykjavik — Tel. 21565



Conventional elliptical styli have a relatively limited bearing radius at the contact area with the groove. The Stereohedron combines the elliptical and Quadrahedron concepts to create a stylus having a larger bearing radius at the contact area in order to reduce stylus wear and prolong record life.

Italy Audio s.n.c., Strada di Caselle 63 — 10040 Leini/Torino — Tel. 9988841
Netherlands Inelco Nederland b.v., Joan Muyskenweg 22 — 1006 Amsterdam — Tel. 934824
Norway Skandinavisk Elektronikk A/S Østre Aker Vei 99 — Oslo 5 — Tel. 15 00 90
Portugal Centelec Lda., Av. Fontes Pereira de Melo 47 — Lisbon — Tel. (19) 561211
Spain Audio S.A., La Ganada 34 — Barcelona 6 — Tel. 2171554
Sweden NASAB, Chalmersgatan 27a — 41135 Göteborg — Tel. (031) 188620
Switzerland Dynavox Electronics, rue de Lausanne 91 — 1700 Fribourg — Tel. (037) 22 46 74
United Kingdom Highgate Acoustics, Jamestown Rd 38 — London NW1 7EJ — Tel. 01-267 4938

Strongly recommended Stokowski



RIMSKY-KORSAKOV: Scheherazade
RPO / Stokowski
RCA RL11182 (£1.99 to 1st Aug '77; then £3.49)

Produced at the end of February 1975, at EMI's Studio 1, and with Christopher Parker as Engineer, this was Stokowski's last recording for RCA. The association dated from 1917, indeed the present sleeve reproduces a fifty-year-old RCA advertisement for Stokowski's Philadelphia Symphony Orchestra *Scheherazade*.

It is difficult to imagine that that early version would illustrate a firmer grip than this Royal Philharmonic disc. Stokowski's shaping of the music, the unique sound that he conjured from orchestral players, are magical. The sound, sumptuous in tone, seems to 'connect' with Stokowski—perhaps only Karajan holds a comparable rapport with his orchestra. And we are drawn into this mesmeric experience.

I have been critical of certain London productions; this one may not quite match the startling brilliance of Stokowski's Mahler *Resurrection*, but it would be churlish to withhold a demonstration grading. The quality is nicely open, the range is extended, and provided you do not mind the string desks close, this can be recommended as the most viable alternative to the Haitink/Philips. (That version I have always maintained is too distantly set for this piece of music!) At climaxes, some sense of grasp of detail is lost, but I am perfectly willing to attribute that to the acoustic character of the Abbey Road Studio. Strongly recommended. [A*: 1*]

Christopher Breunig

ROSSINI: 'The Barber of Seville'
Simionato / Bastianini / Siepi / Corena / Misciano / Maggio Musicale Fiorentino / Erede
Decca D38D3 (3 records) (£5.95)

We treat this, briefly, as a new release although many collectors will recognise a performance dating back to the 1950s, a monaural issue that has since disappeared from the catalogue. This, however, is its first appearance in stereo—genuine stereo I am assured, one of those early recordings that someone decided not to issue as such and not a transcription. I wish Decca could have

been a bit more frank about the circumstances. All you get in the booklet is the bald ©1977; and anyone buying it on that assumption will get a shock when they hear its dated tones. Not very impressive stereo, in fact, though the recording is all right for its period. There are much admired performances by the star soloists (though Erede's conducting tends to be a bit pedestrian) when many of these singers were at their dazzling peak. A quite satisfactory set to have if you cannot run to a modern stereo version. [B/C: 1/2]

Peter Gammond

'RULE BRITANNIA'

Works by Davies, Elgar, Holst, Stanford Robinson, Vaughan Williams, Walton, Wood, Coates, Bliss, Alford, Arne, Sargent and Mathieson
Anne Collins (sop) / RLPO and Choir / Groves
HMV ASD 3341 © (£3.50)

If you like the idea of carefully selected patriotic works sponsored by 'Bass Charrington' to commemorate the Queen's Silver Jubilee, then you are in for a sumptuous banquet of musical delights, thirteen in all, ranging from 'The Dambusters', 'The British Grenadiers' to 'Pomp and Circumstance Marches 1 and 4' and 'Rule Britannia'. The sound quality throughout is excellent, with perfectly maintained and balanced stereo, and extraordinary width of dynamic range. The warmth, excitement and sheer technical brilliance of playing is a credit to Groves and the RLPO. One of the many outstanding items is Bliss' little heard *Processional*, originally performed at Elizabeth II's coronation in 1953.

Like that of Elgar's *Coronation Ode* (reviewed June), the attractive 'Union Jack' sleeve was designed by Chris Yates, who also provided our April cover.

Whether you are a Royalist, support the CAMpaign for Real Ale (CAMRA), or just enjoy music, this record is a beaut. The recording just misses a star in view of a certain lack of ambience. Compared with 'Coronation Ode' (p. 123, June) (admittedly an extreme achievement in this direction), the sound comes across a little deadened. No doubt about its excellence, however. [A: 1]

Richard Anthony

Pleasurable Scarlatti

SCARLATTI: Sonatas for harpsichord (Volume 4)

Gilbert Rowland (hpd)
Keyboard 1004 (£2.70)

Gilbert Rowland is one of our younger generation harpsichord players who gave his first Wigmore Hall recital in 1973 at which—according to the sleeve notes—his playing was commended 'for the sense of spirited enjoyment communicated'. A clumsy phrase perhaps, but I know what they mean. Mr Rowland plays with an abundance of energy—the performances radiate it throughout. His readings have a pronounced but natural sense of rhythm, a remarkable sense of timing and clean, crisp articulation. I found this gentle *rubati* in the slower numbers very telling, and was perhaps most struck by the sense of forward movement that he imparts to his playing. In sonatas like the beautiful K232, the pace never sags, yet there is never any feeling of hurrying.

In order of performance, the record includes K447, K448, K232, K233, K396, K397, K225, K226, K300, K301, K546 and K547. Readers will observe that the recording arranges them in

pairs, as suggested by Kirkpatrick. The recorded sound is very realistic and rather close, but there is no mechanical clumping although the action is audible. Having heard a number of Scarlatti harpsichord records recently by Aveling, Verlet, Tilney and Sgrizzi, this is undoubtedly the one which has given me the most pleasure. Roll on Volume 5! [A*: 1]

Colin Evans

SCHUBERT: Symphony 9 in C, D944 'Great'

Israel Phil / Mehta
Decca SXL6729 (£3.50)

From the first notes Mehta's approach to the Great C major Symphony seems virile, exultant and spacious. Throughout the first movement he maintains a nice sense of propulsion, never allowing the music to languish or become too imbued with his own introspection. Many conductors appear to let their thoughts wander in the acculative passages, but Mehta is on his toes all the time. It is a zestful performance, close to the old Krips reading; some may prefer more relaxation as in the recent Haitink. In the slow movement, Mehta likewise assumes a comparatively brisk pace and allows the music's architecture to emphasise its own shape. Here he discovers less poetry than Haitink or Böhm but maintains a sort of Haydn-esque lilt. Naturally after this we expect an exuberant scherzo—and get it; but never losing the nice spacious feel of the whole performance. The finale continues in the same spirit.

This is not a profound performance, relying more on the natural rhythms and the joyful melodies of the work, letting it stand in clearly delineated lines. Profound thoughts on the subject you will get from Böhm or Furtwängler. But, in its way, it is a highly successful performance, leaving one in a state of exhilaration. The recording is itself of a spacious nature, handling the climaxes well and with plenty of inner detail. It has that inter-speaker space filling quality that I can only define as a recording studio sound rather than the concert-hall one which I prefer. But it is very good of its kind and there is a fine bite to the strings. [A: 1]

Peter Gammond

SCHUMANN: Carnaval, Op. 9 □ **Waldszenen, Op. 82**

Sequeira Costa (pno)
Supraphon 1 11 2026 (£2.75)

It is difficult to write with enthusiasm here. The Portuguese pianist—a former pupil of Marguerite Long, and Jacques Février—is at best in Schumann's introspective music. Elsewhere his playing is rhythmically loose, and he seems to lose concentration; articulation is muddled as the tempo becomes more demanding. And a basically pleasant piano recording is spoiled by noisy surfaces: a consistent surface layer that partially diminished after several playings, at 2.75 gms. This I have reflected in the rating. Arrau is unsurpassed in the *Waldszenen*, but if you want this coupling I suggest the outstanding Deszo Ranki, on Hungaroton, at a similar price. [C: 2/3]

Christopher Breunig

SIBELIUS: Symphony 4 in a, Op. 63 □ **The Bard Op. 64**—tone poem

Bournemouth SO / Berglund
HMV ASD3340 © (£3.50)

This is an admirable coupling, bringing *The Bard* into immediate juxtaposition with the work that preceded it, but I find that the performances elicit something less than enthusiasm. Berglund is a close student of Sibelius, extremely painstaking in his preparation of a score, and at his best—e.g., in the First Symphony (ASD 3216)—very good indeed. His



Magnificent Firsts From CBS

Première Recordings—on Masterworks, of course



MASSENET: LE CID
 PLACIDO DOMINGO,
 GRACE BUMBRY,
 PAUL PLISHKA Etc.
 Opera Orchestra of New York
 EVE QUELER, Conductor
 MASTERWORKS 79300 (3 records)



MEYERBEER: LE PROPHETE
 HORNE SCOTTO McCracken HINES
 LEWIS
 Ambrosian Opera Chorus;
 Royal Philharmonic Orchestra
 HENRY LEWIS, Conductor
 MASTERWORKS 79400 (4 records)



DONIZETTI: GEMMA DI VERGY
 MONTSERRAT CABALLE,
 PAUL PLISHKA,
 LUIS LIMA Etc.
 Opera Orchestra of New York
 EVE QUELER, Conductor
 MASTERWORKS 79303 (3 records)
 Available mid-May

 CBS RECORDS
 17/19 Soho Square
 London W1V 6HE

Everyone should own at least one masterpiece, ours come in pairs

Our hallmark of continual research and development to obtain precision in sound is evident in every Chartwell loudspeaker.

The new PM100 is no exception, and the specially designed bass reflex cabinet incorporating a ducted port enables the PM100 to reproduce natural sound down to 50Hz and below.

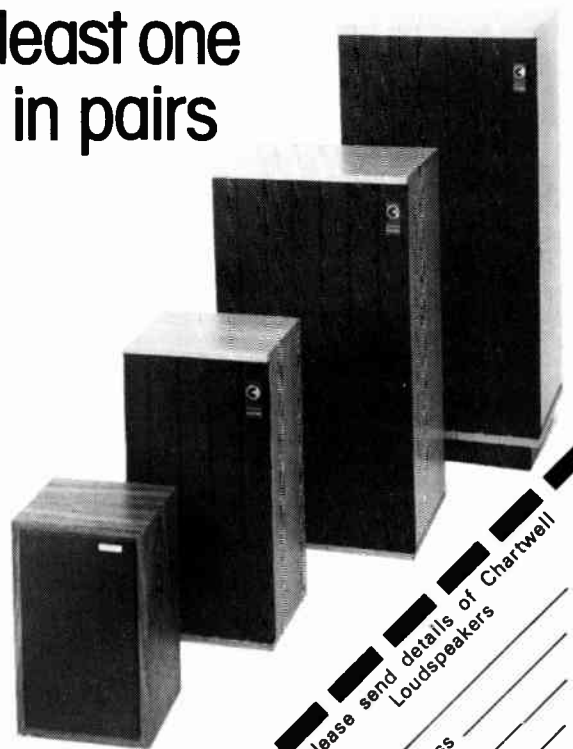
Ask for a demonstration at one of our specialist dealers.



**CHARTWELL
 ELECTRO-ACOUSTICS
 LIMITED**

2 Commonside East,
 Mitcham, Surrey, CR4 1HX,
 England.
 Tel.: 01-648 4494/5
 01-640 7426/7

A name worth listening to



Please send details of Chartwell Loudspeakers

Name _____
 Address _____

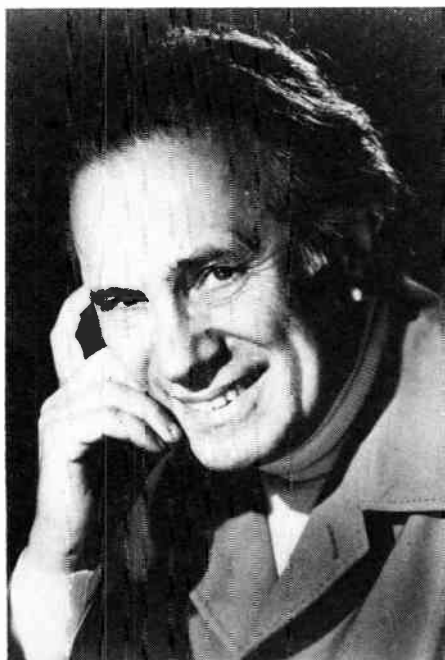
HFRR/JUL 77

big weakness, however, is his tendency towards a laboured, over-deliberate approach in which scrupulous attention to detail comes before all else. Associated with it are slow tempi and a want of animation. Unhappily, these qualities are much in evidence here, particularly in the first three movements of the Fourth Symphony.

The opening movement has the problematical marking *Tempo molto moderato, quasi adagio*. Noting that at the beginning of the recapitulation there is a plain *adagio*, Berglund maintains a very slow tempo, shaping every 'hairpin' with the utmost care, but failing to find a true intensity. The scherzo is by no means *molto vivace*, and the *Largo* is frankly dull, undermined by a lack of tension and perspective. The finale begins briskly, though without establishing a strong current, and then, surprisingly, the pace is retarded at the second subject. Since Berglund is never inconsistent in such matters, this means that the heroic pathos of the ending is reduced to something much more commonplace, lacking in tautness and bite. To a lesser extent, *The Bard*, too, moves rather heavily with insufficient animation; but the detail is clearly and sympathetically exposed.

In the first movement of the symphony, the manipulation of dynamics is not always consistent, but in general the quality of the recording is high. It remains to be seen what Colin Davis will make of the Fourth. Meanwhile, my own choice would still be Karajan and the Berlin PO (138974). [A: 2]

Hugh Ottaway



eleven years with the Minneapolis Orchestra (he made earlier recordings with them of both these works: a *Petrushka* appeared here in Aug '57), and the playing here represents the peak of his musical achievement, arguably.

The disc is also fascinating technically. We know from the EMI/Mercury original *Rite* sleeve that three omnidirectional microphones, suspended at proscenium arch level in the Minnesota campus hall used, fed separate tracks, mixed down for stereo. No doubt the technique was also used for *Petrushka*. The resulting tapes had astonishing immediacy, and depth of image, although the stereo stage is narrower than one feels it should be. The sound is not faultless: tape hiss is very high, and under pressure the quality becomes constricted or 'squeaky'. Even so, the dynamic range and presence, or pinpointing of instruments are still thrilling. Philips have been more faithful to the masters than EMI, who reduced the tape background, producing a more comfortable sound; most important of all, the single-side transfer of the *Rite* is managed without any loss of impact, or levelling. Anyone intrigued by the techniques of recording a large orchestra should listen!

The performances too are brilliant; in *Petrushka* Dorati's speeds often seem unusually fast, but he relaxes too, resulting in an individual and vivid version of the revised score. Again, it is not faultless; the opening is hurried rather than bustling. In *Le Sacre* there is virtually no relaxation; Dorati drives his orchestra with white-heat intensity, and the score takes on a Bartokian savagery. In some ways it is unsurpassed (this is *not* the recording reissued on SFL14009, as stated in print elsewhere!). To convey the flavour: [A*/C: 1*/2] Christopher Breunig

STRAVINSKY: The Soldier's Tale
Rudolph Nureyev (*The Soldier*) | Glenda Jackson (*Narrator*) | Michael MacLiammoir (*The Devil*) | Ensemble | Gennady Zalkowitsch
Argo ZNF15 (£3.75)

Perhaps the publicists will tell us the background to this de-luxe *Histoire du Soldat*, done in a rhyming translation by Nigel Lewis (not a patch on the Flanders/Black), and credited to

'Vendome Developments Limited'.

Of course, one wants to hear what the three speakers do, primarily. It was an attractive idea to have an Irish *Devil*, and Nureyev's nasal sing-song, faintly outraged delivery, and hints of amusement make up for acting limitations. Glenda Jackson has too much talent for this flattened text, and it was surely a mistake for her to assume an ill-matching Russian accent (when the narration overlaps the soldier's part). Did she tape her contribution separately, I wonder? Anyway, the producer seems unable to know what to do with the voices, and he subjects the narration—generally when overlaid on the music—to a horrible change of timbre, bringing the voice forward and filtering it drastically. Mainly the three voices are static, but at one point the soldier's is put through a reverberation chamber. Neither of the male voices coincides with the stage location of the fiddle, when this is called for. The effect used for the stage-coach ride reminds one of fast spooling tape!

In fact, by the standards of BBC stereo drama, this is a feeble production. It is decidedly inferior to the DG, with the superlative Boston Chamber Players (2530 609), and as a presentation it sags drastically after the initial realisation of the devil's trickery, until the card game. Nor is the musical performance a compensation; the anonymous instrumentalists do not seem over-familiar with Stravinsky's score. The approach is cautious, even sluggish, and ensemble sounds precarious more than once. There is no refinement, no panache, and the disc does not even produce the requisite sparkle: the music reproduction suggests a tape copy; perhaps this is a result of the mixing process for the master.

Regrettably then, a disappointment rather like the Argo Walton *Façade*. Music rating [A/B: 3]

Christopher Breunig

LEOPOLD STOKOWSKI CONDUCTS HIS TRANSCRIPTIONS

ALBENIZ: Fete Dieu à Seville / CHOPIN: Mazurka in b[♭] □ Prelude in d / DEBUSSY: Clair de Lune □ La Soirée dans Grenade; NOVACEK: Perpetuum Mobile / RIMSKY-KORSAKOV: Flight of the Bumble Bee □ Ivan the Terrible / SHOSTAKOVICH: Prelude in e[♭] / TCHAIKOVSKY: Humoresque
NSO / Stokowski
CBS 73589 (£3.49)

This is not the place to argue the merits or demerits of transcriptions in general; merely to remark that Leopold Stokowski is the most successful exponent in our day of the practice of transcribing music of every kind for performance by full symphony orchestra. He has been doing it for a very long time. I well remember, as a schoolboy, almost wearing out a black label HMV 78 rpm disc of Stokowski's most famous transcription, the Bach Toccata and Fugue in D Minor. The disc reviewed here carries 10 transcriptions of works by seven composers, nearly all the compositions being well known and popular. Opinions will vary regarding the relative merits and success of these transcriptions, but it is certain that this record will do nothing to decrease the appreciation of the works, and it displays his veteran conductor's flair for orchestration to the full.

The recording, made at West Ham Central Mission, London in July last year has a tendency to favour the middle and upper registers at the expense of the bass, giving an effect of clarity and brilliance, but also a somewhat shallow quality. String tone is not ingratiating particularly above *mf* and the record is cut at higher than average levels. [C: 1] B. J. Webb

STRAVINSKY: Petrushka (1947) □ Rite of Spring*

Minneapolis SO / Dorati
Philips 6582 021 (£1.99). * R Mercury AMS16065 (1960)

Even discounting the quantity of music involved, I regard this as a significant recoupling—to be snapped up by those with a real interest in the gramophone. Dorati spent

TCHAIKOVSKY: Piano Trio in a, Op. 50
Igor Zhukov (pno) | Grigori Geigen (vln) | Valentin Feigin (vlc)
HMV 'Melodiya' HQS1381 (£2.50)

Tchaikovsky's ambitious Trio comprises an Elegy (moderato), and a set of 11 variations plus finale, based on a theme stated by the piano. It is a pity that EMI place this, with Variations 1-3, at the end of side 1, when side 2 runs for just 26 minutes.

The variations are in effect vignettes of some brilliance; No. 3 is especially attractive, No. 8 is a jolly fugue, followed by a movement with muted strings which anticipates Rachmaninov's *Vocalise*, then a Mazurka with cadenza-like passages for the pianist. The insistent figures in the very Russian finale point to Shostakovich. The material is variable, the salon-like nature of much of the writing seeming at odds with the scale Tchaikovsky set himself.

The playing is vigorous and fluent; the violinist is occasionally strained. The sound quality is inconsistent, with the piano generally set back and rather shallowly reproduced. The violin, accidentally faded down at one point briefly in the finale (where all three players are given more presence), seems to be screened acoustically from his colleagues. Violin and cello are very forward. [B/C: 1] Christopher Breunig

TO ENTERTAIN THE STEALTH OF LOVE

Fortune's Fire
Enigma VAR1023 (£3.49)

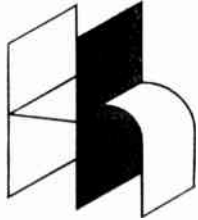
An obscure record title if ever there was one. Fortune's Fire is not, as one could well

GLOSSOP ROAD GOSSIP

July is the month in the hi-fi trade when the rumours start about all the new products which are going to appear at the Autumn hi-fi Exhibitions. One product which is certain to arouse a lot of interest is a new Pre+Power Amplifier, by A & E Electronics: we have had a pre-release model on test for a couple of months, and it is a very very clean amplifier, and should do a great amount of harm to the sales and reputation of some of our more expensive British Amps. It seems from what some of our regular customers tell us, that a number of you read our adverts and treat them as sensible down-to-earth reviews. Thank you. Let's hope our adverts give the impression of what we are—a small, but very enthusiastic dealer, who as they say in Yorkshire calls a spade a bloody shovel. The business is run by the two John's, so to make life much easier, we are known to our regulars as Rupert and Mole. Rupert is the Managing Director, whose attitude to hi-fi is if you can hear a difference then there is a difference, if not keep your money in your pocket. But if there is a difference and you can't hear it, and it has been known for Rupert to spend days, illustrating and explaining the difference to people. He likes his music, clear and straight, no colourations, no cheating, very much the true enthusiast. Mole—he says, 'he is the good looking one with the beard', has been in the industry for years, served his apprenticeship with valve amps, and remembers the days when service was so important that every hi-fi shop had it's own service department (not like today—sorry it is faulty sir, it will have to go back to the makers); his attitude today is just the same. Like Rupert he likes his music clean, straight, and natural, has weaknesses for old hi-fi equipment, real ale, and rally cars, hates a heavily coloured sound and ill-informed and untrained staff in hi-fi shops!

What's on special offer this month, I don't know, (that's fooled you), seriously I think we are disposing of a number of used units, e.g. Uher Reporter Portable, with rechargeable batteries, etc., absolutely mint, tried and tested A.O.K. Allen Keith Mixer, Sony TC250, TC377, J.V.C. Receiver with S.E.A., and a number of Dual turntables, all of which are open to offers. New Bargains must be Trio Amps, especially the KA1500 (must win the value-for-money race), I keep on seeing quantities of Rotel and Aiwa regularly arriving so it must be on the 'super deal' list soon, but rush and give us a ring soon. A pair of Nakamichi Monitors want a good home, any offers? Nearly forgot—the new Pro-Ac are now available and are on demonstration once again, a new experience in sound, remember, Pro-Ac Rules.

Mole's motoring hint for the month you have a car with a noisy gearbox—care to fit a Pioneer in-car-unit—it will drown all the noise from the gearbox, and remember they are always on special offer with us. *Till next month—Bye.*



AUDIO CENTRE SHEFFIELD

284 Glossop Road
Sheffield S10 2HS

Telephone: 0742-737893

Export and Professional Dept. 730064

Master Tape Copies of outstanding quality

Suitable for equipment analysis and demonstration purposes are available from **CRESCENT RECORDS**. All items selected are known to have the highest degree of fidelity to the original sound and were recorded using pair or coincident microphone technique to preserve the phase relationship, perspective and reverberation pattern of the source material. No compression or equalisation was used and original masters and copies were engineered using the finest professional equipment. A wide range of instruments and musical styles is represented. The programme is approximately 35 mins long and is followed by an azimuth section and full frequency run to ensure optimum results.

Standard format: 7½ips NAB, narrow guard band. 7in professional matt backed LP tape.

Payment with order: **£18** inc VAT. Post free. Overseas **£19.50** inc Air Postage.

15ips NAB/CCIR, 7½ips CCIR, Dolby A /Non Dolby to order.



CRESCENT RECORDS,
Avon Recording Services,
6, Camden Crescent,
Bath, BA1 5HY, England.

Your carpet is no place for the Black Dyke Mills Band



... they should be
half way up the wall!

Fidelity Fastenings are
the newest, smartest
way to place your speakers
where they belong – on the
wall. Almost undetectable
when fitted they are easily
adjustable and allow your speaker

system to be placed in the best possible acoustical position,
where they stay due to the rubber friction mounting. Fidelity
Fastenings take a weight of up to 50 lbs and your speakers
are easily lifted off for dusting and redecorating.

Available from all good Audio and Hi-Fi shops and stores at
£5.49.

Look for the red and black box. If you have any difficulties
in obtaining your Fidelity Fastenings, write
for details of your nearest stockists to:

Fidelity fastenings

The Ridgeway, Iver, Buckinghamshire,
Tel: (0753) 654222.



SUPERIOR PERFORMANCE

Tape

When
quality
counts

THE DECCA RECORD COMPANY LIMITED,
Decca House, 9 Albert Embankment, London SE1 7SU

★ ★ ★

The closing date for receipt of Classified
Ads in Hi-Fi News is 1st July 1977.

Please write to Pam Daly before the above
date to be sure your Ad appears in
the AUGUST issue.

★ ★ ★

imagine, some new heavy rock outfit, but the collective name of Wynford Evans (tenor), Carl Shavitz (lute) and Peter Vel (gamba). The recording turns out to be an attractive collection of seventeen lute-songs by some of the significant composers of the day, including Ferrabosco, Campion, Rosseter, Jones and of course, Dowland. The greater part of the record in fact, is given over to the songs of Dowland which include *Can she excuse my wrongs* and *Come heavy sleep* both of which strike me as particularly successful in terms of performance.

I found Wynford Evans—no relation, incidentally—to be eminently suited to this charming intimate music. He has a light, attractive tenor voice, and his ability to hold the listener's attention through two sides of an LP is no mean feat. The words are crystal clear and his intonation never falters. The supporting cast are competent players, and Carl Shavitz's sympathetic accompaniments are very commendable.

The sleeve contains full texts of the songs, and the recording quality is of a high standard. [A: 1] *Colin Evans*

CHAMBER MUSIC WITH RECORDER

TELEMANN: Sonata in C □ Sonata in f □ Trio Sonata in d □ Trio Sonata in a □ Concerto a Tre in F

Concentus Musicus of Denmark
Nonesuch H71065 (£1-85)

If one were asked to single out a particular concerto or sonata by Telemann and claim for it the kind of popularity currently enjoyed by the *Four Seasons* or Handel's *Water Music*, that piece would probably not be found on this present disc. There can, however, be no denying that the programme here presented is quite delightful and highly entertaining. The music is full of charm, wit and novel instrumental tone colour.

The Concentus Musicus of Denmark (a comparison with their more illustrious Viennese counterpart would perhaps be a little unfair) offer pleasing interpretations and the horn in the Concerto a Tre really does sound like an instrument of the natural brass variety. Here, contrary to the sleeve note, the horn plays in only two movements.

The recording attains a reasonable level of acceptability but the editing leaves a little to be desired. [B: 2] *Victor McAloon*

TOMASEK: Eclogues (Selection)

Pavel Stepan (pno)
Supraphon 1 11 1488 (£2-75)

Vaclav Tomasek was a contemporary of Beethoven, and possibly the most important Czech composer of his time. He is currently represented only by his piano concerto, but his most significant compositions are the series of short, lyrical pieces variously entitled Eclogues, Rhapsodies and Dithyrambs. All are imbued with the poetic spirit that inspires the titles, and all are very attractive. The present selection from the several sets of Eclogues, which were published in sets of six, gives a good idea of the whole. Much of the music is lively, clearly based on Czech national music, and relatively simple in form. The selection recorded by Stepan sensibly offers a contrast of styles and mood and they are played with the necessary virtuosity, for Tomasek was a writer for the keyboard of considerable skill, a forerunner of the generation of pianist-composers that included Chopin and Liszt as well as being a general polymath, equally expert in the theory of music, chemistry, mathematics, physics and politics. The piano is clearly recorded with excellent definition. A most attractive issue. [A: 1] *Kenneth Dommett*

VIVALDI: The Four Seasons

Ralph Holmes (vln) | Cantilena | Adrian Shepherd (dir)
RCA GL25061 (£2-49)

Cantilena, founded in 1971 by Adrian Shepherd, made its first important recording on the Grange label in 1975. In conjunction with Ralph Holmes this potentially enterprising ensemble now offer a very original account of the Four Seasons. Their interpretation is one of great contrast and boldness, indeed some listeners may find the alternation between soli and tutti, fortissimo and pianissimo just a trifle too pronounced. Notwithstanding, the solo violin figuration is well managed and tempi are perceptively chosen. The unnamed continuo player must be commended for a most effective filling-up of the figured bass part. The string bass reinforcing the harpsichord is uncommonly powerful, particularly in the tutti sections. The recording is clear and set in a fine acoustic. [A/B: 1/2] *Victor McAloon*

VIVALDI: Cello Concertos in G (P.118) □ a (P. 35) □ g (P. 369) □ a
Christine Walevska (vlc) | Netherlands CO | Redel
Philips 9500 144 (£3-50)

Although Christine Walevska has brought out at least two records here already, and the sleeve of this issue lists others that will presumably be forthcoming, I had not previously heard her. The favourable reports I have read are amply justified—she is an exciting artist, strong, fiery yet capable of great delicacy (even when the performances, as I thought was often the case here, sound a little larger than life). Initially, with harpsichord continuo jangling away, I did not think I was going to be enjoying myself; but once I had turned the volume control down somewhat and come to accept the scale of the performances, my pleasure grew. As far as I can tell, only the G major concerto is otherwise available, in the flute version; but despite the concern shown by the sleeve-note writer to identify the works, it is no easy task with Vivaldi. (I have given only the Pincherle numbers, which are used in the *Gramophone Classical Catalogue*; I confess I do not know whether the RV numbers also given refer to the Rudge or the Rinaldi catalogue.) It must suffice to say that we have four delightful works chosen from the 27 solo cello concertos by Vivaldi; the string writing is unfailingly skilful, often inventive, at its finest unexpectedly rich and affecting. No movement outstays its welcome; the sound is immediate, fresh and undisturbed by even a ripple of surface noise. [A: 1] *Peter Branscombe*

Jubilee Junketings

WALTON: Gloria □ Coronation Te Deum □ Crown Imperial—coronation march □ Orb and Sceptre—coronation march

Barbara Robotham (m-sop) | Anthony Rolfe Johnson (ten) | Brian Rayner Cook (bar) | Choristers of Worcester Cathedral | CBSO and Chorus | Frémaux
HMV ASD3348 (£3-50)

I have often cursed the acoustic of Birmingham Town Hall, but for recording this brilliantly festive music it seems to have been virtually ideal. What at concerts can so easily confuse and overwhelm is here a rich ambience, at one with the music and productive of a vivid, natural presence. Full marks to David Mottley and Neville Boyling for using the hall so successfully; for this is mostly a star recording, the split rating arising from some internal pre-echo in the *Gloria* and one

or two moments when the chorus is less than ideally balanced with the orchestra. These balances, however, could be performance rather than recording matters. The *Gloria*, written in 1961 for Sargent and the Huddersfield Choral Society, is chorally the most demanding of Walton's works, requiring the precision and certainty of professional singers. Apart from an initial slightly tentative impact, the CBSO Chorus rises splendidly to the challenge, and the orchestra likewise is in excellent form. In this first recording, the *Gloria* emerges as the ultimate paean in the manner associated with the God of Gold and the God of Jacob; there is also a good deal of *Troilus*, not least in the operatic set-piece for the three soloists. An underrated work, perhaps because of its exacting demands. The *Te Deum*—another first recording—also comes up very well, with the ambience contributing positively to Walton's spatial intentions, and there are lively performances of the two marches. A pity Frémaux takes the big tune in *Crown Imperial* a little heavily, but his feeling for Walton is strongly confirmed by this record. Warmly recommended. [A*/A: 1] *Hugh Ottaway*

ANDREW WICKS:

CHICHESTER CATHEDRAL CHORISTER

Songs by Schubert, Boughton, Britten, Stanford, Spohr, Vaughan Williams, Arne, Mozart and traditional

Andrew Wicks (sop) | John Birch (pno) | Lee Stevenson (cfl)

Abbey LPB778 (£2-79)

Andrew Wicks, born in 1963, joined the Choir of Chichester Cathedral in 1971 and became Head Chorister of 1975. He has a fine voice, in the English choirboy tradition, and at fourteen, a remarkable presence and personality that indicate a potential career in the world of musical entertainment. To present a young voice of this kind in the right sort of programme is a difficult task and Andrew Wicks himself is not entirely to blame for the fact that this recital is not completely successful; but he can take the credit where it is. To begin with, no one in his right mind could surely think that the long and arduous *Shepherd on the Rock* by Schubert (the catalogue bearing performances by such as Christa Ludwig, Sheila Armstrong and Elly Ameling and memories of Elisabeth Schumann) is a fair trial for a boy soprano. Messrs. Birch and Stevenson are partly to blame for a lugubriously over-careful accompaniment; the recording studio is guilty of producing a heavy, muffled piano tone. Andrew Wicks sings it well enough but we are plagued with uncertainty all the way and, frankly, one could not often listen comfortably to this performance. Throughout the recital, it seems to me that John Birch, perhaps understandably to some extent, is tending to lead the singer and often, by being over-careful, is sometimes hindering his natural expression. Given his head, one feels that the singer would have produced something livelier. In some of the more suitable items like Britten's *The birds*, Stanford's *The monkey's carol*, Vaughan Williams' *Linden Lea* the results are good. In Schubert and Mozart one is conscious of a boy not doing quite as well as eminent adults. In *Trottin' to the fair* it is difficult to disassociate the mind from the Harveys and Dawsons. One hates to be discouraging where young talent is concerned. Having heard him live recently, I know he is capable of better than this poorly produced recital suggests. I hope he will try again with the right material and take things more into his own hands. [B/C: 2] *Peter Gammond*



STEREO
 SP-19019
 (SP-19024)

1. Joan Armatrading 4:19
 "It Could Have Been Better"
 "High"

2. Cheryl Dlicher 2:44
 "High"

3. Lani Hall 3:30
 "Sundolen"

4. Paul Williams 5:14
 "That's Enough For Me"

5. Quiney Jones 4:05
 "Summer in the City"

© 1972 A & M Records, Inc.
 © 1973 A & M Records, Inc.

The SAE 5000 can make this record sound 'good as new'

**OTHER STATE OF THE ART MODELS BY SAE
 MANUFACTURERS OF THE WORLD'S FINEST
 HI-FI EQUIPMENT**



SAE 2900
 Pre-amplifier with
 equalizer



SAE 2200
 Power-amplifier
 2 x 100 watts



SAE 2800
 Parametric
 equalizer



SAE Mark
 VIII Digital
 tuner



Ever since the invention of the recorded disc annoying "clicks" and "pops" caused by scratches, static and imperfections have consistently disturbed the listening pleasure of music lovers.

Now, SAE introduces the unique model 5000, an impulse Noise Reduction System which eliminates virtually all those unwanted sounds with no adverse effect on the quality of the recorded material.

This breakthrough in electronic circuitry is so demonstrably effective that the SAE 5000 is destined to become an essential part of any sound system.

The SAE 5000 is compact and sleek, built to SAE's exacting standards, and ready to enhance the performance of any system, from the standard receiver/turntable combination, to the most sophisticated audiophile components.

Please send me full details of the SAE 5000 and other models.

Name

Address

..... HFN 6

Sole UK Distributors: DES Technical Co., 10-12 High Street, Colliers Wood, London SW19. Tel.: 01-540 8944.

Orchestral/Symphonic

BEETHOVEN's Symphony No. 4 is another in the Decca/Solti/CSO/Beethoven cycle (SXL 6830, £3-50), taken from the '76 box set. The added bonus is **Weber's Oberon Overture**. There seems little to add than has already been said about the sound quality and musical directorships of these recording masterpieces. First class throughout. [A*: 1*]

Two splendid recordings of American music have been combined on DG Privilege 2535 210 (£2-15). Seiji Ozawa's reading of the Symphonic Dances from *West Side Story* by **Bernstein** with the San Francisco SO was acclaimed for its clarity and power on its release in '74 and the coupling, **Gershwin's** Piano Concerto in F, played by Roberto Szidon with the LPO conducted by Edward Downes, was recommended by our reviewer in '71. The passing years certainly haven't eroded these comments and this is definitely an album to rush out and buy. Recording quality is excellent on both works: several star moments in the Bernstein with the orchestra beautifully suspended in the surrounding ambience. [A*: 1]

A **Bizet** concert from Ansermet and the Suisse Romande on Decca ECS 801 (£1-89) includes a performance of the Symphony of good 'morning broadcast' standard [B: 2], a jolly *Jeux D'Enfants* and an outstandingly fine [A: 1] *Fair Maid of Perth* Suite. [A/B: 1/2]

Britten's dark-toned *Sinfonia Da Requiem* and the more approachable *Diversions for Piano (left hand) and Orchestra*, with Katchen (pno) are on Decca ECS 799 (1) (£1-89). Both works are conducted by the composer and are very well recorded, belying the date of the original (1954) issue. [A: 1]

Anceri's performance of **Dvorak's** *New World* Symphony with the Czech Philharmonic, excellent though it was, suffered from Supraphon's indifferent recording. Its reissue (Legend LGD 004, £1-49) has done nothing to improve matters. The sound is uncomfortably boxy with booming brass and ill-defined strings. Not recommended. [D: 1]

Haydn's 'Clock' and 'Surprise' Symphonies with the Philharmonia Hungarica/Dorati are again reissued in yet another coupling, now on one of Decca's cheapest labels—SPA 494 (£1-89). Both are spectacular recordings of admirable performances, even if they are not outstandingly the best available, for the best are by Jochum/LPO on DG, but that costs nearly twice as much. [A: 1]

On DG Privilege 2535 229 (£2-15) Böhm, with various orchestras, plays **Mozart Overtures**. All have been issued before, but never (DG say) have these been collected onto a single disc. The Overtures included are the *Flute*,

Seraglio, *Così*, *Schauspieldirektor*, *Figaro*, *Don* and the one in Italian style (Symphony 32). Böhm performs in characteristic manner with varying degrees of appeal. Due to their origins, occasional overtures fade out without a concert ending. [A/C: 1/2]

On Decca ECS 797 (£1-89) there is excellent pseudo-Spanish music. **Rimsky-Korsakov** contributes *Capriccio Espagnol*, **Chabrier** *Espana*, **Moszkowski** *Five Spanish Dances, Op. 12* in orchestral form and **Granados**, the only native Spanish composer

panàche; the recording and pressing are of the highest standard, with comfortable distancing and good perspectives. Instrumental tone is particularly well-caught. [A*: 1]

Two famous named String Quartets by **Haydn**, the 'Emperor' (op. 76/3) and the 'Sunrise' (op. 76/4), are on Argo ZK 16 (£2-50). They make a welcome reappearance from the bondage of their box sets. Well performed by the Aeolians and well recorded, but at times oh so shrill! The supreme performance by the Italians [A*: 1]

Déjà Vu

A reissue roundup
conducted by Richard Anthony, John Atkinson,
Christopher Breunig, John Crabbe, Peter Gammond,
Geoff Jeanes, Paul Messenger, and Leon Thompson

included, is represented by an orchestration of his *Danza Espanola* No. 5 (Andaluzia). All are brightly performed and nicely recorded under the Spanish conductor Argenta with the LSO. [A/B: 1/2]

R. Strauss' Also sprach Zarathustra is impressively performed by Steinberg conducting the Boston SO on DG 'Privilege' 2535 209 (£2-15). The sound quality is bright and vibrant, with excellent stereo presentation. After the impressive 'sunrise' opening, the work settles down to the composer's familiar haunting overtones. Good clean surfaces and a recommended budget introduction. [A: 1]

Chamber/Concertos

ON Argo ZK 13 (£2-50) Simon Preston plays **Bach's** Six Choral Preludes, known as the 'Schübler' (the original publisher). On side 2 are two Fantasias of **Mozart** (K608 and K594). Amazingly fine performances with the Bach miraculously rendered in appropriate sound on the massive organ of Westminster Abbey. Fine natural recording. [A: 1]

Philips' reissue of **Handel's** *Concerto a due Cori* (concerto Nos. 1, 2, 3 6580 218 £1-99) serves to remind one that the reissues can be as good or better than the new releases. Although ten years old, there is little to criticise on this record. Raymond Leppard leads the ECO with sensitivity and

on Philips costs an extra pound. [B: 2]

Mozart's Clarinet Concerto (Prinz/clt) and the Flute and Harp (Tripp/flt, Jellinek/hrp) with the VPO/Munchinger are on Decca SPA 495 (£1-89). This is a straight repeat of the first record of DPA 521/2 (March 1976). The performances and recording are attractive and can be recommended to anyone not yet caught by previous Decca permutations. [A: 1]

Decca ECS 796 (£1-89) features members of the Vienna Octet with Panhoffer (pno) in a performance of the Piano and Wind Quintet K452 by **Mozart**. This work the composer once described as being 'the best thing I have ever composed'. While we may be excused for disagreeing, it is undoubtedly most attractive, and coupled as here with the popular Clarinet Trio makes a most attractive record in fine modern sound. [A: 1]

The **Nielsen** Concertos for Flute and Orchestra and Clarinet and Orchestra are on Decca ECS 800 (1) (£1-89), performed by the Danish Radio SO. The 1954 recording, now electronically enhanced, is vividly worthy of its place in 1977. Both works are 'difficult' music, of specialist appeal. The flute soloist is the original dedicatee, but here his fine performance is veiled by poor instrumental balance. [B: 1]

On Decca ECS 803 (£1-89) is Ricci's famous recording of **Paganini's** 24 Caprices, displaying once again his fantastic performance. The recording is good if a little bright at times. A musical

curiosity for occasional consumption. [A/B: 1]

Eight piano concertos by twentieth-century British composers are brought together in the HMV boxed set SLS 5080 (4 recs., £7-25). These are the concertos by Bliss, Britten, Ireland, Rawsthorne (1 and 2), Rubbra, Tippett and Williamson (piano and strings): an impressive selection, with the Rubbra the most underrated. The soloists include Horsley, Lympany, Matthews and Ogdon, and the recording dates range from 1958 to 1975. Some performances are outstandingly fine, and in most cases the recording is B—but **A** in Britten, **C** in Bliss and parts of Rawsthorne 2. (Note that the Williamson, which dates from 1975, as well as the Tippett, has been in stereo before.) [A/B/C: 1]

Vocal/Operatic

THE only easily obtainable recording of **Bach's** Cantata 131 ('Aus der Tiefe') coupled with the delightful **Handel** wedding-anthem 'Sing unto God' reappears on Nonesuch H-71294 (£1-85) after earlier release by EMI. The performers—strong soloists with London Bach Society ensemble under Steinitz—give their all—sometimes almost too much—to renderings that have been curiously balanced by the engineers. The music is tidily managed, even though some of the lyricism of both Bach and Handel is lost as a result. [B: 2]

Sargent's 1955 recording of **Gay's** *The Beggar's Opera*, out of the catalogue since 1965, now returns on HMV ESDW 704 (2 records, £4-50). Amazingly, its only current rival is of the same vintage. Lively and appealing, with a double cast of actors (Old Vic Company) and singers (Morison, Sinclair, Shacklock, Cameron, Wallace, Brannigan, etc.) and the Pro Arte Chorus and Orchestra, this has come up very well and is notable for the roundness and consistency of its old-style recording. So long as one accepts the rather obvious cleavage between singers and actors, [A: 1]

Excellent highlight disc of **Strauss** *Die Fledermaus* under the sure guiding hand of Karl Böhm (Decca SET600, £3-75). The highlights no longer need any of the reservations about cuts in the original 'complete' issue. An excellent cast—Wächter, Janowitz, Holm, Kunz, Windgassen, Kmentt—present a fairly serious account of the work. The main asset is the superb orchestral playing of the Vienna Philharmonic. Sensibly, room is not wasted on the Overture (of which there are many versions) but Decca concentrate on getting as much vocal delight as possible on the disc. [A: 1]

You get a more attractive deal from Wilmslow Audio



I'm Karen. I take your telephoned Access and Barclaycard orders and also deal with orders from Government Departments, Local Authorities, etc.



I'm Vanessa - Export expert! If you want us to send an amplifier to your cousin in Upper Bongoland it's my job to know which customs forms are required and the most efficient means of transport.



I'm Sheila - it's my job to see that our despatch department gives you the fastest mail order service in the business!



I'm Sian, I deal with your requests for catalogues and will be delighted to send you details of any HiFi item that takes your fancy.

We thought that we'd like to show you some of the charming people you'll be dealing with. (We employ lots of fellas too, but whilst they are renowned for their technical knowledge, patience and enthusiasm - they're not all that pretty!)

We feel sure that you'll find our prices rather attractive too and every sale has full backing - during the guarantee period and after - from our own efficient service department.

In addition to the makes listed below, we will offer you an equally attractive deal on AIWA, ARM-STRONG, BOWERS & WILKINS, CASTLE, CELESTION, CHARTWELL, DUAL, FONS, FORMULA 4, I.M.F., J.R., KEF, LINN SONDEK MONITOR AUDIO, NEAL, NYTECH, ORTOFON, PICKERING, RADFORD, RAM, SANSUI, SME, STANTON, SUGDEN, SHARP, TANDBERG, TANNOY, TEAC and TRIO.

We stock the largest range of loudspeaker drive units, kits and components for loudspeaker constructors in the country (see our ad. on another page). Listen before you build!—We have Hi-Fi News State of the ART design, Hi-Fi Answers Monitor PRO9-TL etc. on demonstration.

PRICES INCLUDE VAT @ 12½%

AKAI			
CS34D	£105-00	p/p £2-50	
4000DS II ..	£150-00	p/p £2-50	
CS705D	£140-00	p/p £2-50	
CS707D	£175-00	p/p £2-50	
AM220D	£87-95	p/p £2-50	
AM240D	£133-00	p/p £2-50	
CELESTION			
Ditton 11 pair ..	£60-75	p/p £2-75	
Ditton 15 pair ..	£98-50	p/p £2-75	
Ditton 44 pair ..	£181-00	p/p £3-75	
Ditton 33 pair ..	£153-00	p/p £3-75	
GARRARD			
I255B Mod. ..	£53-00	p/p £2-50	
86SB Mod. ..	£69-00	p/p £2-50	
HITACHI			
PS38 (inc. cartridge)	£92-00	p/p £2-50	
SR302	£115-00	p/p £2-50	

SR502	£135-00	p/p £2-50	
SR6100	£130-00	p/p £2-50	
FT3000	£77-00	p/p £2-50	

LEAK			
3200	£170-00	p/p £2-50	
3400	£213-95	p/p £2-50	
3001	£99-95	p/p £2-50	
3020 pair ..	£95-00	p/p £2-50	
3030 pair ..	£129-00	p/p £2-75	
3050 pair ..	£181-00	p/p £4-00	
3080 pair ..	£265-00	p/p £6-00	

PIONEER			
PL112D	£59-00	p/p £2-50	
PL115D	£72-00	p/p £2-50	
SX450	£119-00	p/p £2-50	
SX550	£149-00	p/p £2-50	
SX650	£215-00	p/p £2-50	
SX750	£254-00	p/p £2-50	

SX850	£338-00	p/p £2-50	
CTF7070	£210-00	p/p £2-50	
CTF8080	£249-00	p/p £2-50	
CTF2121	£139-00	p/p £2-50	

RICHARD ALLAN			
RA8 pair	£66-00	p/p £2-75	
RA82 pair ..	£103-00	p/p £4-00	
RA82L pair ..	£124-00	p/p £4-00	
Maramba pair ..	£81-00	p/p £2-75	

ROTEL			
RA312	£69-50	p/p £2-50	
RA412	£88-00	p/p £2-50	
RA712	£108-00	p/p £2-40	
RA812	£149-95	p/p £2-50	
RX152 Mk II ..	£99-00	p/p £2-50	
RX202 Mk II ..	£114-00	p/p £2-50	
RX402	£149-50	p/p £2-50	

RD12F	£157-00	p/p £2-50	
RD20	£149-00	p/p £2-50	
RP900	£64-00	p/p £2-50	
RP1500	£72-00	p/p £2-50	
RM5010	£330-00	p/p £2-50	
RT324	£79-50	p/p £2-50	
RT724	£99-50	p/p £2-50	

WHARFEDALE			
Chevin XP pair ..	£31-00	p/p £2-50	
Denton 2XP pair ..	£45-95	p/p £2-50	
Linton 3XP pair ..	£66-50	p/p £2-75	
Glendale 3XP pair ..	£91-50	p/p £3-75	
Dovedale 5P pair ..	£158-00	p/p £5-00	
Airedale 5P pair ..	£267-00	p/p £6-00	

VIDEOTONE			
Minimax II pair ..	£46-95	p/p £2-50	
Saphir I pair ..	£59-00	p/p £2-75	



WILMSLOW AUDIO



SWIFT OF WILMSLOW

SWAN WORKS, BANK SQUARE, WILMSLOW, CHESHIRE.
(SPEAKERS, MAIL ORDER AND EXPORT)

10 SWAN STREET, WILMSLOW (HIFI AND PUBLIC ADDRESS)

5 SWAN STREET, WILMSLOW (HIFI AND RADIO)
TELEPHONE: WILMSLOW 26213 (HIFI) 29599 (MAIL ORDER ETC.)

Classical Cassettes

Peter Gammond

BOX AT THE OPERA

THERE is always something pleasantly exciting about these boxed sets, plumply promising even though, when you get inside, there may only be two cassettes in all that space. But they make a nice shelf display and the booklets inside are the right sort of size for civilised reading and reference—not like some of the disc inserts which you couldn't possibly take to an opera with you.

The new recording of Wagner's *Der fliegende Holländer* (Decca K24K32, £11.25) is a vastly exciting affair from the first note. Its big, wide, spacious sound certainly seems worthy of a star most of the time with the reservation, as our disc reviewer said, that a certain edginess occurs every now and then at louder moments; and the brass is as sharp as a razor. I am no Wagnerian, though gradually learning from the wide opportunities this cassette column offers but it all seems very dramatic, even melodramatic, to me—which is how I would expect this work to be. If I am guided by PB as to the interpretations of the roles, I certainly think that the orchestral playing deserves a star as well—[A*/A: 1*/1]. There is an immediate contrast in sound when we turn to Bellini's *Norma* (Decca K21K32, £11.25). This is a totally different perspective, more artificial with a surrounding resonance, giving a warmer and not unpleasant effect but not nearly so dramatic as in the Wagner. The original record issue dated back to 1965. Here Sutherland was coming to her peak of achievement and she shines out above an excellent cast. Bonyngé leads a performance of wonderful balance and effect with a steady beat that is so essential to this period of Italian opera. Altogether a most satisfying issue [A: 1*/1].

BEETHOVEN to DVORAK

Beethoven: Symphony No. 6 *Pastoral* (Fontana 7328 007, £1.75). A nicely lyrical, flowing account with a pleasantly rounded recording (1964) that copes well with any climaxes [A: 1]. Dorati is again the conductor with the Concertgebouw in **Berlioz** *Romeo and Juliet*—love scene, with the LSO in **Tchaikovsky** *Romeo and Juliet* (Philips 'Sonic' 7320 045, £2.25). Dorati seems to impose himself equally well on both orchestras to produce controlled and often ravishing performances. The recording, though dating back to

1960/1, is of that smooth, pleasing quality for which Phonogram have so often been praised in the past [A: 1]. I thought for a moment at the beginning of the next cassette that we were about to plunge into the **Berlioz** *Carnaval romain* overture but it turned out to be **Moscheles**, and the oboe Heinz Holliger (Philips 7300 515, £3.50). Other concertos by **Rietz**, **Bellini** and **Molique** make up an attractive oboe and flute recital with Holliger and Nicolet accompanied by the Frankfurt Radio Symphony and Eliahu Inbal. Attractive works attractively played. The recording is 1976 but, as in some recent issues, the bass is just a little short of well defined [A: 1]. Cziffra plays 14 **Waltzes** by **Chopin** (Fontana 7327 042, £1.75). For my taste the music is pulled about just a bit too much and, on cassette, I would prefer Katin. But these are undoubtedly very sensitive and romantic performances which I think would satisfy most criteria. Again the recording is 1963 but it is as good a piano sound as I have heard for some time [A: 1]. An excellent all-round standard is certainly being achieved on these Phonogram reissues and again I was pleasantly surprised at the 1965 recording of **Debussy** *La mer* and *Trois nocturnes* with the Concertgebouw under Van Beinum (Fontana 7327 044, £1.75). I believe these performances were always highly valued and I certainly find them not only sensitive but also full of vitality [A: 1]. By comparison the Decca 1969 **Delibes** *Coppélia* under Ansermet (Decca 2LP KDPC2 7045, £3.75) has a much wrier quality that cannot be said to be quite as pleasant. These are excellent performances as usual by Ansermet in this sort of music [B: 1]. We get a powerful and convincing performance by Colin Davis and the Concertgebouw of **Dvorak** Symphony No. 7 (Philips 7300 535, £3.50), all round the best recommendation on cassette, although I have a strong liking for the virile Kertesz performance. Again, the modern recording does not always appear so musical as some of the more straightforward older ones and you get a certain roughness in the louder ensembles [A/B: 1]. Although full of the right orchestral timbre, as you might expect of the Czech Philharmonic under Vaclav Neumann, **Dvorak** *Slavonic dances* (Decca 'Phase 4' KPFC4396, £3.60) seems to be a little bull-headed in approach as if providing the accompaniment for a rustic dance.

In the quieter works the lyricism prevails and one gets that delightful Czech flavour to the full. The same applies to the recording, which is a bit overpowering at louder moments but has great fidelity and strength in the lyrical passages [A/B: 1/2]. Maurice Gendron is one of my favourite cellists and I think that he and Haitink make a marvellous job of the **Dvorak** Cello Concerto (Philips 'Sonic' 7317 162, £2.25), with *Silent woods* and Rondo in G as fillers. Haitink is in one of his powerful moods and this gives good support to Gendron's very full and biting cello tone. In spite of this, there is a great deal of lyrical tenderness in the interpretation of this magnificent work. Recording sound and balance very pleasant [A: 1/1*].

HANDEL to TCHAIKOVSKY

Again I am impressed by the quality of a recording dating back to 1958. The quality of tape used in these Fontana reissues must be excellent, for here is a smooth, clear quality that only just betrays its age by a slight lack of body. The **Handel** *Water Music* (Fontana 7327 027, £1.75) is well played by Van Beinum and the Concertgebouw in a not too self-conscious style that should suit the widest tastes [A/B: 1]. Colin Davis offers an enjoyable account of **Haydn** Symphony 88 (which I rate as one of his very best) and 99 (Philips 7300 534, £3.50); there is warmth and spirit and precision in nice balance. The recording impresses most of the time but tends to get a bit boomy at louder moments so that some detail becomes lost [A/B: 1]. The Frederica von Stade fan-club is heavily in favour of anything she does right from the start so there may be prejudice here. She sings **Mozart** and **Rossini** arias with the Rotterdam Philharmonic and De Waart (Philips 7300 511, £3.50). She is at least one of those opera singers where a personal warmth always seems to come through and her virtuosity is rarely exhibitionistic. Rhythmic accompaniments and a recording that maintains a good balance [A: 1]. **Mozart** Symphonies 40 & 41 by Schmidt-Isserstedt (Fontana 7328 006, £2.25) is 1962 vintage. You might just suspect it from the slight edginess of strings, and there is slightly more background than on most of these releases. These are direct, big-boned performances of a popular but not insensitive nature that should please a wide audience

[B: 1/2]. The **Respighi** *Airs and Dances* are most delightfully done by Dorati and the Philharmonia Hungarica together with **Bartók** *Rumanian folk dances* (Philips 'Sonic' 7321 022, £2.25). Dating from 1959, this is one of those Mercury recordings that so impressed at the time. Still quite distinguished with the remembered excellent stereo spread but not quite refined enough at louder moments. The performances leave nothing to be desired [A/B: 1]. I have been accused of undue harshness toward the Haitink **Schubert** Symphony 9 (Philips 7500 510, £3.50) and others have reviewed it more favourably. After many listenings I think I must hedge my bets by acknowledging some excellent moments but I still think (compared to such as Krips and Furtwängler) that he is inclined to dally overmuch, there are many passages where momentum is lost. I find that the recording, on disc as well as tape, though generally good has a tendency to thicken up at the louder moments [A/B: 1/2]. Having listened to a good deal of Dorati, my estimation of him continues to soar. He is a most musically conductor and proves it yet again in his **Tchaikovsky** Symphony No. 5 (Philips 'Sonic' 7321 023, £2.25). This is a calm performance that reserves its powers for the right moments and not over-romantic. The recording is not quite as clear as some of the above and is a little cloudy in the lower stratas [A/B: 1].

COLLECTIONS

Gala Concert in Prague (Fontana 7327 041, £1.75) has tracks dating between 1959 and 1965 and includes **Mozart** Symphony 38 (Maazel), **Dvorak** *Slavonic dances* 2-4 and **Smetana** *Vltava* (Anserl). Anyone requiring this mixture on cassette should find this a fairly adequate offering. The recording is a little on the over-resonant side in the bass [B: 1]. **Gala Concert in London** (Fontana 7328 612, £1.75) chooses **Handel** *Fireworks* (Maazel), **J. C. Bach** Harp concerto (Challan/Couraud) and **Haydn** Symphony 101 (Sawallisch with similar results [B: 1/2]). **The Art of Pavarotti** (Decca KSXC 6839, £3.75) has works by **Verdi**, **Rossini** and the like performed in this artist's rich and exciting manner. A treat for all lovers of full-blooded Italian singing. He has the advantage of a splendidly clear recording which favours the voice [A: 1].



"C'est si bon...ow you say?
British sound, eets so good!"

For the French to acknowledge the superiority of a British sound there's just got to be something special about it. And — of course! — there is. Our hi-fi loudspeaker design and manufacturing technology leads the world.

And Celestion's capability leads in Britain. Our famous Ditton and UL ranges give you everything you want for the price you are prepared to pay to get the best out of your hi-fi system.

From the small compact bookshelf loudspeaker up to the big, Ditton 66,

whatever you choose you get the ultimate in speaker experience with Celestion.

Ask any hi-fi enthusiast and he'll confirm our claim. But first have a look for yourself at the sound we're selling. Send for our literature or visit your local stockist.

Celestion



Rola Celestion Ltd., Ditton Works,
Foxhall Road, Ipswich, Suffolk IP3 8JP.
Telephone: Ipswich (0473) 73131.
Cables: Voicecoil Ipswich. Telex: 98365.

Name _____

Address _____

01.11.07

Celestion loudspeakers bring home the world of sound

World Radio History

THE Beach Boys Love You

(Reprise K54087, £3.29), the latest album from the now hirsute surfing songsters, is hardly '70s fare and—give or take a synthesiser or two—could easily have been concocted anytime during the mid-'60s. The Freshmen harmonies remain the same—though Brian Wilson's own lead vocals now display distinct signs of wear and tear—and the songs are still pure high school, Coney Island and fizin' Pepsi. Not that I'm being derisive, nobody could ever sing basically trite material with half the charm of the Beach Boys and as far as I'm concerned they can re-vamp *Barbara Ann* and *I get around* until Van Dyke Parks gets taken over by the National Trust. So while there's no *Surf's up, Good vibrations* nor even a *Disney girls* on Love You—only Brian Wilson's dead-pan send-up of Stateside TV personality *Johnny Carson* is destined to end up any future *Best Of . . .* compilation—the candy floss is of superb flavour and comes recommended to anyone with a sweet tooth. [A: 1*]

Perhaps the real Beach Boys (Southport division) of the '70s

Taco Ryan blowing pure jazz tenor over easy riffs and Floyd Domino completing the piece with a piano figure that Basie's employed since the creation of man. And *Am I high?* is equally daffy, with Texan vocal, Hot Club du Austin fiddle etc.—while *A dollar shr!* is just Western dance hall with a heritage you can trace back to Hank Thompson rather than Bob Wills. Along with Alvin Crow and the Pleasant Valley Boys, AATW have brought a youthful aura to Western Swing that's bound to grab all but the heaviest rockers. No wonder that Eric Clapton's been turned on to Don Williams—if Hendrix had lived maybe even he would have picked up a dobro by now! [A: 1]

Roger Daltrey, on the other hand, has decided that punkdom is and always was his forte—and one can easily understand his stance by comparing *The Clash* (CBS 82000, £3.39) with some of the early Who output. True that Mick Jones, Joe Strummer and Co. exist on primarily high energy productions and anti-establishment slogans, as do many of their major rivals on the razor blade and

standard and as a collector I find the whole deal totally irresistible. [B/C: 2]

Though some of Motown's live albums have proved too show-biz by far—Diana Ross' recent monstrosity being a case in point—*Marvin Gaye's Live At The London Palladium* (Motown TMSP 6006, £4.99) is whole different soufflé of soul. Some of his intros are a bit weak-kneed and of the 'nice to be here with you lovely people' genre, but when Gaye moves into real vocal action, little happens that isn't totally praiseworthy. He duets with Florence Lyles, goes solo for a hit medley that includes *Trouble man*, *How sweet it is* and *I heard it through the grapevine*, and *in toto* demonstrates how he managed to turn his recent ten-date tour of Britain into a standing room only affair. A double-album, three sides are devoted to Gaye's on-stage material, the fourth featuring a marvellous, full-length version of *Got to give it up*, his latest single. [B: 1]

I suppose that whisking the Mighty Diamonds away from their native Jamaica and handing them over to Allen Toussaint in New Orleans in order to cut such sides as *Tracks of my tears* and *Get out of my life, wcmn* could be construed as a worthwhile commercial idea. But *Ice of Fire* (Virgin V2078, £3.49), while by no means a dismal release, sadly lacks the power of the Diamonds' previous *High Time* and one hopes that the new audience that Virgin obviously hope to reach with the new album will be interested enough to indulge in a little back-tracking, thus discovering what the Diamonds do best . . . though I have my doubts that this will happen [A: 2]. Sometimes, unlikely material does pay off. If you have doubts, then check out the title track of *Let 'Em In* (Phil. int. PIR81695, £3.39) on which Billy Paul takes Paul McCartney's attractive but inconsequential little ditty and transforms it into a plea for racial unity and a tribute in praise of those who have fought and died for this cause—at the same time fashioning a likely disco hit. While the album has some faults—I could have done without another nothing-to-add version of the late Pete Ham's *Without You* and *Word sure gets around* sounds a dead ringer for *Long and winding road*—it's probably Paul's strongest set for some considerable time and worth spending time with. [A: 1]

By contrast, Supertramp's *Even In The Quietest Moments* (A & M AMLH 64634, £3.60) is disappointing, though I expect it to be a chart record. Well produced by the band themselves—who obviously learnt a great deal from their association with Ken Scott—the album is immaculate in every way. But it fails to move me one iota, which is why the rating is no higher than [A: 2]. My advice, then, is to save your cash and invest instead in a copy of Peter

ROCK



Fred Dellar

Tosh's *Equal Rights* (Virgin V2081, £3.49), a disc which bridges the gap between message music and commercial appeal with re-sounding success. Superbly recorded in Jamaica (and mixed at Criteria Studios in Florida), *Equal Rights*, a collection of basically simple songs, backed to perfection by Bunny Wailer, Al Anderson, Sly Dunbar and Robbie Shakespeare, is possibly destined to accrue the greatest sales yet experienced by a reggae album. 'It's time you recognise my quality', Tosh proclaims on a song titled *I am that I am*. Too true. [A*: 1*]

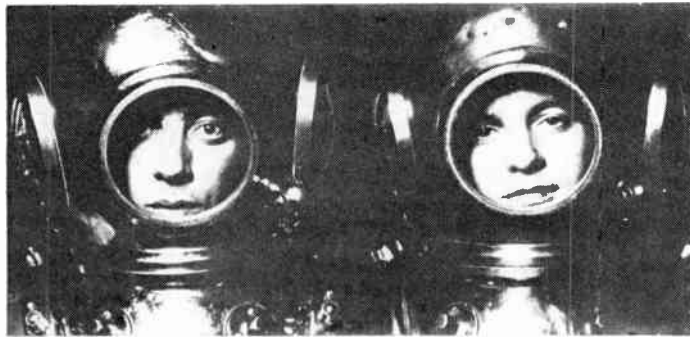
CHECKLIST

A Bunch Of Stiff (Stiff SEE22, £3.50), is an outstanding collection of singles, out-takes and neglected classics mainly created by the likes of Britain's two top rock 'n' roll producers, Nick Lowe and Dave Edmunds, the latter's own version of Chuck Berry's *Jo Jo Gunne* being in the unbelievable category. [B: 1]

Roy Orbison: **Regeneration** (Monument MNT 81808, £3.39)—after many years in the wilderness, Orbison has resumed his relationship with Monument Records once more—and the result is his most impressive album yet. Great, gutsy arrangements of songs by Dennis Linde, Tony Joe White, Bob Morrison and Kris Kristofferson. [A: 1]

Van Morrison: **A Period Of Transition** (Warner Bros. K56322, £3.29)—Van's about the only thing connected with Belfast that's dull right now. Despite help from Dr. John, this one is strictly a two steps left, two steps right, affair for a singer who's nearly always delivered the goods in the past.

Gryphon: **Treason** (Harvest SHSP4063, £3.35). The crumhorn kings move on into heavier territory, Richard Harvey and Tim Sebastian's songs often sounding vaguely Yes-like, though it's *Snakes and Ladders*, a calm before the tempest instrumental track that proves most memorable. Production on this one was by ex-HiFi Newsman Mike Thorne, who's probably (and justifiably) pleased with the results of his labours. [A: 1]



10 cc.

are 10cc who, now reduced to a mere 5cc by the departure of Lol Creme and Kevin Godley, employ their superior harmony-work on the often intricate word-games that bedeck *Deceptive Bends* (Mercury 9102.502, £3.50). With Eric Stewart and Graham Gouldman now in charge, there appears to be no easily discernible change in direction—you'll find tracks that you can correlate with *Une nuit à Paris* and *I'm not in love*—and though such hits as *The things we did for love* and *Good morning, Judge* are included, the number that's received most time on my turntable has been *Honeymoon with B. Troop*, an opus which has more to do with family planning than the commendable dib-dib-dib sentiments originally expressed by Baden-Powell. [A*: 1]

In the something completely different department, I offer *The Wheel* (Capitol E-ST11620, £3.35) by Asleep At The Wheel, a band whose personnel seems to increase with every album—the most recent count crediting them with 11-piece status. The *Wheel* proves AATW to be just as un-categorisable as ever. The title track is pure swingsville, with

safety pin circuit—but I certainly prefer their album to several that have emanated from established, so called 'name bands', during recent months—Clash's version of Junior Murvin's *Police and thieves* being the most listenable piece of white reggae I've heard in yonks. So forget all the 'punk' and 'new wave' tags, Clash are nothing if not a first-rate, totally valid, rock and roll unit—which is why we all came to see the picture in the first place! [A: 1]

An intriguing Polydor release is *Medium Rare* (2482 381, £1.98), a compilation that includes *Crackers*, a previously unreleased track from Focus; *Come to the sunshine*, an early Van Dyke Parks cut that was later covered by Harpers Bizarre; *Sarah Crazy*, by John's Children, a Marc Bolan rarity; *Trees*, a Gallagher and Lyle item recorded even before the duo joined McGuinness-Flint—and others by The Birds (featuring Ron Wood); *Airforce* (with Denny Laine on guitar and vocals); *Mainhorse* (organised by Patrick Moraz) Lee Dorsey and Area Code bandman Bobby Thompson. The music covers a wide spectrum, of course, but it's of a generally high

DELTA (HOUNSLOW) LTD

Huge stocks - Huge discounts

MAIL ORDER INFORMATION
AND PRICES

50 BELL ROAD, HOUNSLOW, MIDDX.

TELEPHONE 01-572 2285
(3 Lines)

STEREO SYSTEMS

P & P £3.00

Sanyo 2811 ..	£249.00
Sanyo 2711KL ..	£195.00
Sanyo G2615 ..	£89.00
Sanyo 2422 ..	£159.00
Sanyo 2711 Dolby ..	£215.00
Aiwa ..	P.O.A.
J.V.C. ..	P.O.A.
National ..	P.O.A.
Hitachi ..	P.O.A.
Sharp ..	P.O.A.
Sony ..	P.O.A.
Pioneer ..	£269.00
Tandberg ..	P.O.A.
Toshiba ..	P.O.A.

AMPLIFIERS

P & P £3.00

Akai AM2200 ..	£85.00
Akai AM2400 ..	£129.00
Akai AA5510 ..	£105.00
JVC 11 ..	£71.00
JVC 31 ..	£108.00
Pioneer SA5300 ..	£65.00
Pioneer SA6300 ..	£79.00
Pioneer SA8500 ..	£199.00
Pioneer SA7500 ..	£179.00
Pioneer SA9500 ..	£275.00
Pioneer SA7300 ..	£125.00
Pioneer SA9900 ..	£399.00
Pioneer EXGLC3 ..	£775.00
Pioneer EXCLH3 ..	£850.00
Rotel RA212 ..	£59.00
Rotel RA312 ..	£69.00
Rotel RA412 ..	£89.00
Rotel RA712 ..	£109.00
Rotel RA812 ..	£155.00
Rotel RA1312 ..	£279.00
Rotel RA1412 ..	£359.00
Sansui AU2900 ..	£65.00
Sansui AU3900 ..	£95.00
Sansui AU4900 ..	£115.00
Sansui AU9900 ..	£369.00
Marantz 1030 ..	£72.00
Marantz 1040 ..	£131.00
Marantz 1060 ..	£114.00

TUNERS

P & P £3.00

Armstrong ..	P.O.A.
Pioneer TX5300 ..	£75.00
Pioneer TX7500 ..	£149.00
Pioneer TX9500 ..	£195.00

Rotel RT224 ..	£65.00
Rotel RT324 ..	£83.00
Rotel RT724 ..	£97.00
Rotel RT1024 ..	£269.00
Sansui TU3900 ..	£105.00
Sansui TU5900 ..	£155.00
Sansui TU7900 ..	£179.00
Sansui TU9900 ..	£295.00
Sony ST5150 ..	£165.00
Sony ST5130 ..	£169.00

TUNER AMPLIFIERS

P & P £3.00

Armstrong ..	P.O.A.
Akai AA1020 ..	£149.00
Akai AA1030 ..	£169.00
Akai AA1050 ..	£272.00
Marantz 2230 ..	£195.00
Marantz 2245 ..	£285.00
Pioneer SX450 ..	£112.00
Pioneer SX550 ..	£143.00
Pioneer SX650 ..	£199.00
Pioneer SX750 ..	£240.00
Pioneer SX850 ..	£319.00
Pioneer SX950 ..	£369.00
Pioneer SX1250 ..	£559.00
Rotel RX202 Mk 2 ..	£104.00
Rotel RX402 ..	£147.00
Rotel RX602 ..	£179.00
Rotel RX802 ..	£229.00
Sansui 221 ..	£78.00
Sansui 331 ..	£107.00
Sansui 551 ..	£127.00
Sansui 661 ..	£167.00
Sansui 8080 ..	£367.00
Sansui 9090 ..	£449.00
Sansui 5050 ..	£187.00
Sansui 6060 ..	£227.00

TAPE DECKS

P & P £3.00

Akai 4000DB ..	£199.00
Akai 4000DS ..	£147.00
Akai GXC630DB ..	£459.00
Akai G256D ..	£329.00

ALSO

**MAIN
AGENTS
AND
STOCKISTS
OF**

**AIWA AR
ARMSTRONG
B & O BOSE
CAMBRIDGE
CELESTION
CELEF
DUAL DENON
HARMAN KARDON
HITACHI
IMF JBL JVC
LECSON
MARANTZ
MONITOR AUDIO
NAKAMICHI
NATIONAL NEAL
QUAD
RICHARD ALLAN
REVOX ROGERS
SANSUI
SHARP SHURE
S.M.E. SONY
STUDIO CRAFT
TANDBERG
TANNOY
TDK TEAC
TOSHIBA TRIO
TRANSCRIPTORS
VIDEOTONE
YAMAHA etc.**

RECORD DECKS & PACKAGES

P & P £3.00

Connoisseur BD1 Kit ..	£13.90
Connoisseur BD2/SAU2/PC ..	£49.00
Connoisseur BD3 ..	£75.00
Garrard Mod. 125 ..	£47.00
Garrard Mod. 251V M75 ..	£36.00
Garrard Mod. 86SB M75 ..	£63.00
Garrard DT75 ..	£96.00
Garrard GT55 ..	£98.00
Pioneer PL112D ..	£55.00
Pioneer PL115D ..	£69.00
Pioneer PL117D ..	£105.00
Pioneer PL510A ..	£109.00
Pioneer PL530 ..	£170.00
Pioneer PL550 ..	£190.00
Sansui SR222P ..	£59.00
Sansui SR525 ..	£129.00
Thorens TD125/II ..	£99.00
Thorens TD125AB/II ..	£140.00
Thorens TD160C ..	£76.00
Thorens TD145C ..	£107.00
Michell Hydraulic Ref. ..	£129.00
Michell Hydraulic Arm ..	£153.00
Michell Electronic ..	£139.00
Michell Electronic Arm ..	£179.00

CASSETTE DECKS

P & P £3.00

Akai 705D ..	£139.00
Akai 707D ..	£169.00
Akai GXC570 ..	£410.00
Akai GXC740D ..	£309.00
Akai GXC310D ..	£139.00
Akai GXC710D ..	£209.00
Pioneer CT2121 ..	£133.00
Pioneer CTF6060 ..	£170.00
Pioneer CTF7070 ..	£185.00
Pioneer CTF8080 ..	£239.00
Pioneer CT9191 ..	£289.00
Sony TC118 ..	£95.00
Sony TC135SD ..	£115.00
Sony TC136SD ..	£135.00
Sony TC138SD ..	£169.00
Sony TC177SD ..	£389.00
Sony TC186SD ..	£125.00
Sony TC204SD ..	£159.00

Sony TC209SD ..	£239.00
Sony TC206SD ..	£169.00
Sansui SC636 ..	£109.00
Sansui SC737 ..	£119.00
Sansui SC2000/2 ..	£148.00
Sansui SC3000/3 ..	£169.00

SPEAKER SYSTEMS (PAIR)

P & P £3.00

Goodmans SB1 ..	£38.00
Goodmans RB18 ..	£48.00
Goodmans RB20 ..	£63.00
Goodmans RB35 ..	£91.00
Goodmans Achromat 400 ..	£145.00
Sansui ES200W ..	£149.00
Sansui LM220 ..	£169.00
Sansui LM330 ..	£209.00
Videotone Minimax 2 ..	£49.00
Wharfedale Denton 2XP ..	£45.00
Thorens TD125/II ..	£99.00
Thorens TD125AB/II ..	£140.00
Thorens TD160C ..	£76.00
Thorens TD145C ..	£107.00
Michell Hydraulic Ref. ..	£129.00
Michell Hydraulic Arm ..	£153.00
Michell Electronic ..	£139.00
Michell Electronic Arm ..	£179.00

CASSETTE RECORDERS

Mono and Stereo P & P ..	£1.50
Sanyo 2502 ..	£40.00
Sanyo M3000G ..	£42.00

RADIO CASSETTE

Mono and Stereo P & P ..	£2.00
Sanyo M2404 ..	£49.00
Sony CF440 ..	£95.00
Sony CF170 ..	£55.00
Sony CF210 ..	£66.00
Sony CF550 ..	£115.00

ALSO

Noise reduction units; Styli; Headphones; Pickup arms; Cartridges; Radios, Tapes; TV's; In-Car; Plugs and leads
All prices correct at 18/1/77 inc. 12½% VAT, all prices subject to change without notice.
* Price on application, quotes by telephone or letter welcome. Barclay and Access welcome. HP to callers only.
* No cheques without bankers card for callers, to £30 only.
All equipment carries one year guarantee. Service available.

* RING FOR BEST PRICES *

★ EXPORT WELCOME ★

ALL PRICES INCLUDING VAT

All above makes Price on Application. Immediate quotations by telephone.

DELTA (HOUNSLOW) LTD

50 BELL RD., HOUNSLOW, MIDDLESEX. TEL: 01-572 2285
OPEN MON.-SAT. 9-6 CLOSED WED. HALF DAY.



HERE was a time when the dance halls of England throbbed with Latin American rhythms—or at least, what were thought to be Latin American. The wave of dances that followed in the wake of the *tango* included the *rumba* from Cuba, the *samba* from Brazil, the *beguine* from Martinique, the *son*, the *conga* and many others. In the versions that were danced in New York or London the dances had been transformed out of recognition: who knows the *batawaque* from which the *samba* derived, or the *semba* gesture which gave the later dance its name? Well, most of those dances have been forgotten in the post-rock years or have suffered the ultimate fate—death by a thousand sequins in 'Come Dancing'.

There has been relatively little in the way of authentic music and dance from the Latin American countries issued recently, or at least, little that has come my way.

Mexico: Fiestas of Chiapas and Oaxaca recorded by the untiring David Lewiston is one of a small number of such issues. On Nonesuch H-72070 it is uncompromisingly peasant music, recorded with no pretensions or special arrangements, in Oaxaca in the central highlands of Southern Mexico and in the Chiapas mountains on the Guatemala border. It opens with a street fiesta of Mother Guadalupe; fireworks explode and whoosh and the church bell tolls against the playing of flute and tambor. It has an immediate impact but the tune sounds oddly American; in fact, I realised eventually that it was the same as the *Ballad of Charles Giteau* (the assassin of President Garfield) and this inevitably suggested alien influences. Coincidence perhaps. At any rate, they like it for the theme appears again on the last track of side one. Other tracks include marimba pieces with as many as four musicians playing the *grande* instrument with a somewhat too familiar tune. The effects of colonial influence can be detected in the *Valse Chiapanecas* and European-derived themes and instrumentation—as in the five hundred brass bands of Oaxaca state alone—are more evident than one might have supposed. So 'Chanta' Vielma, a popular singer and guitar player has a *cante hondo* like delivery. Few surprises and no outstanding performances, this is a record that reflects current styles of the region by average musicians. [B: 2/3]

Slightly misleadingly subtitled 'In praise of Oxala and Other Gods' **Black Music of South America** (Nonesuch H-72036) is a stronger record. The track in praise of Oxala was recorded in Brazil and rather loosely described as a variant 'of the religion which the slaves brought from Africa'. The religion or the part of Africa are unstated though they relate to the Yoruba of

Nigeria. This track, with thrusting, very African-sounding drumming, is impressive. Rather more elementary is the recording made in Ecuador, *Olgame Juanita*, played on very simple home-made instruments and blown calabashes. Several items on the record come from Columbia and they include a number of considerable interest. Among these are a few played and sung to the *currulao* rhythm popular in the remote Guapi region. Some of these are Christmas carols with apparently, 'virtually unintelligible texts'. So the fact that the same rhythm and style is used for a sexually explicit song *Salomé* is somewhat surprising. All side two is devoted to music from Guapi, which is characterised by hard-toned, often leader-and-chorus singing to marimbas, drums and rattles. A couple of tracks made in the north Brazilian city of Bahia include an unusual music called *cappoeira* which is used to accompany, and probably to draw attention from a lethal martial art of the same name; and a *samba de roda* chanted to a shuffling dance which will doubtless disillusion some fans of the ballroom version. [A/B: 1/2]

John Storm Roberts is a writer and researcher who has worked on the relationship of African and Afro-American music forms for a number of years. He has compiled **Caribbean Island Music** (Nonesuch H-72047) from recordings made in Haiti, the Dominican Republic and Jamaica. Avoiding calypso and steel bands he has concentrated on lesser-known aspects. Most forms of music here (with the exception of the *merengue*, represented by a country version of the national dance) will be unknown to the ordinary listener. But they are not unapproachable; in fact this is the most varied and most listenable of the records so far discussed. The couple of themes from Haiti are the least interesting, including a rather flaccid *bolero*, but Dominica provides some valuable material. Among several good tracks the leader-and-chorus songs stand out, and I liked especially the *Salve Corrida* in a more ornamented style, sung by peasant women. The music of Jamaica is more strongly rhythmic with an amusing *Percy Where Him Gone* drummed on the *tambo* and sung to a missing brother who was late for the session. Digging work songs show both related and different qualities to those of North America, and John Storm Roberts reminds us that the sea-shanties may also have helped sustain the leader-and-chorus form of these. British influence is to be heard in the distant strains of *Maggie May* reinterpreted as *Mango Time* by a Jamaica 'spasm band', and still more remarkably by 'Mummies', a play performed in the streets at Easter and Christmas which is directly descended from the British mummer's plays with the addition of hot

drumming. How this form of street theatre was translated to Jamaica should surely be the subject of research. [A/B: 1]

This feature is about the origins and hybridisation of rhythms and music of territories colonised by European countries, and the misconceptions that have arisen through their transplantation to the dance halls of the west. But of course, there's always a two-way traffic, and in the examples cited we find blends of African and Indian, Hispanic and British traditions creating hybrid forms. Going further east to the islands of the Pacific which have strong associations with Europe or the U.S.A. we find similar processes taking place. Tonga has again been in the news recently, with the Queen's visit to the Pacific, and Lavinia A Finau's recordings of the **Music of the Friendly Islands** have been issued on Tangent TGM122. Undeniably pleasant, even charming, they may well represent the music of the little kingdom as authentically as is possible today. I do not know if there are more basic forms in the forests or whether the whole area is represented by music as polite and controlled as this. There is reason to think so; the earliest writings of Captain Cook's day, and contemporary prints, all reveal an organised, harmonious, disciplined approach to song and dance. *Fakatapu* is noted as probably being closest to that heard and seen by Cook; if so then the earlier forms used cross-melodies to a far greater extent than the almost invariable use of harmonising heard on much of the rest of the record. 150 years of the Methodist Mission has left its mark as the *Apostle's Creed* in Tongan indicates. The famous Toupou College has a brass band whose playing wouldn't disturb a whisker on the Eastbourne bandstand while the seeking after honours and the importance placed upon them, either by the Tongans or Lavinia Finau, or both, weighs heavily on the music. Queen Salote's own composition *Lave Malie Mai* is performed in hotel lounge folk style while Sione Aleki, 'ukelele virtuoso' plays her *Loka Siliva* with the concert accomplishment that brought him to the Sidney Opera House. Closest to the feel of a folk tradition are the songs of Primary School children and *Hiva He Pitu Taukae*, recorded at 4.00 a.m. at 'a typical informal gathering'. The latter is as spirited as could be expected for Lavinia Finau writes: 'I assure you they were all teetotalers! Just as well that by Law you must apply to the Ministry of Police for a licence before you can buy any liquor'. [B: 2/3]

This blending of styles and cross-fertilisation of the musical influences of different cultures can destroy indigenous forms while giving rise to new ones. This, in a way, is how the influence of the west on the island and

folk



Paul Oliver

Latin-American cultures might be viewed, and how the European-derived popular dance forms that they also inspired can be seen. Exemplifying this at many levels is **Hawaiian Guitar Hot Shots** (Yazoo L-1055) which documents aspects of the popularity in the United States of the Hawaiian guitarists following the annexation of the island at the turn of the century. Scores of youngsters from the island adapted their musical talents to American taste, spreading the dance craze of the 'hula-hula' and introducing the Hawaiian bars and slide guitar techniques that were to be taken up by blues musicians and which are today universally employed in rock music. It was probably Joseph Kekuku, a schoolboy at Oahu who first employed the clasp-knife for this purpose, and coupled with the 'slack-key' tunings in which certain strings were tuned below concert pitch, the technique implanted a special colour to the nostalgic island melodies. This album has not a single *hula* on it; in fact it demonstrates the influence of American traditions on the Hawaiians, with examples of ragtime, march music, jazz, blues and popular song played in Hawaiian style. As a study in Hawaiian music it is lop-sided but there is much fine playing to be heard on it, especially in King Denny Nawahi's *Tickling the Strings* and the accomplished work by Sol Hoopii on *In Ma-La-Ka-Mo-Ka-Lu*. The Hauulea Entertainers played fast American numbers that inhibited the languor of the slide technique; *12th Street Rag* and *Ellis March* for example, which are the kind of tune expected of ukelele soloists likewise. Yazoo is a label principally directed to the interests of blues collectors so their *Railroad Blues*, Franchini and Dettborn's *Palakiki Blues* or *Stack O'Lee Blues* by 'King, Queen and Jack' have been included with them in mind. Not the definitive Hawaiian record by a long way, but one which underlines the complexities of cultural exchange in folk music. [H: 1/2]

Your Hi-Fi Dealer

LONDON AREA

CROYDON'S
TAPE RECORDER & HI-FI CENTRE

All leading makes in stock, Hi-Fi equipment, cabinets, etc.

SPALDING ELECTRICAL LTD.,
352/354, Lower Addiscombe Road,
CROYDON. CRO 7AF
Phone: 01-654. 1231 & 2040

Established 1910

H. L. SMITH & CO. LTD.

Comprehensive stock of equipment at competitive prices

National Panasonic and Technics

287-9 Edgware Road
London W2 1BE Tel: 01-723 5891

FOR THE BEST DEAL, IN OR OUT OF TOWN CONTACT:

TV CENTRE OF STIRLING SOUND

JVC SONY Technics Quad YAMAHA
Armstrong KEF HITACHI AR

TDK SA90 £14.50 BASF C90 £8.95

J loudspeakers

TV Centre (Earlsfield) Ltd STIRLING SOUND LTD
545 Garratt Lane London, SW18 66 High St West Wickham, Kent
Tel: 01-946 0709 Tel: 01-777 9321

BEDFORDSHIRE

70 Bedford Road - Kempston - Beds MK43 0SE - Bedford 854133

Bedford Audio

- PERSONAL ATTENTION
- LEADING MAKES
- COMPETITIVE PRICES (TEL FOR QUOTE)
- COMPARATOR DEMONSTRATIONS
- TAPE RECORDER CLINIC (TEST REPORT £5)
- SERVICING BY EXPERTS

OPEN UNTIL 8 PM FRIDAY
CLOSED MONDAY

CAMBRIDGESHIRE

FOR ALL YOUR HI-FI REQUIREMENTS

University AUDIO

1 & 2 PEAS HILL
CAMBRIDGE Tel: 54237
Also at SOUTHAMPTON

Your Hi-Fi Dealer

CHESHIRE

SWIFT OF WILMSLOW

Dual, Trio, Pioneer, Kef, B & W, Richard Allan, Akai, Armstrong, Radford, Rotel, Monitor Audio, Sansui, Aiwa, Tannoy, Castle, Videocone, Ram, Chartwell, Jim Rogers, Wharfedale and Tandberg.
5 Swan Street, Wilmslow, Cheshire Wilmslow 26213

Part exchange. Comparator demonstrations. Home dems. and installation service. Private after-hours dems. and consultancy. Up to 5 years guarantee. 4 Channel. 'Studio One' where only the best is available. Choose from Bang & Olufsen, Sony, Technics, J.V.C., Quad, Marantz, K.E.F., A.R., Sonab, Armstrong, Harman Kardon and most better makes.

the hi-fi centre **hrda** member

GREEN LANE WILMSLOW Tel.: Wilmslow 24766.
CHESHIRE SK9 1LW Closed Wednesday.
For personal attention phone Wilmslow 22112 and ask for Mr. Bird. Car Parking.

CLWYD

The best in HI-FI at the LOWEST prices

T. E. Roberts
26 King Street, Wrexham, N. Wales.
tel: 4404/4527

DEVONSHIRE

EXON AUDIO

184 Sidwell Street, Exeter T5048
over Wopple Bros. & Row

CONCERNED EXCLUSIVELY WITH STEREO HIGH FIDELITY EQUIPMENT FOR DISCRIMINATING MUSIC LOVERS

IN PLYMOUTH and serving the south-west

Quality equipment, comparator demonstrations, deliveries, guarantees, service AND discounts. Credit too if required, of course, at the largest hi-fi showrooms in the South-West.

PETER RUSSELL'S HI-FI ATTIC
58 New George Street, Plymouth
Tel: 69511 (over Brook St. Bureau)

Your Hi-Fi Dealer

DEVONSHIRE (continued)

SOUTH DEVON-TORBAY HI-FI SPECIALISTS

★ Expert advice & service ★ Comp. & home dems. AIWA - AR - ARMSTRONG - CELESTION - JVC KEF - LEAK - LINN SONDEK - MORDAUNT SHORT - PIONEER - TANDBERG - TECHNICS TRIO - TEAC - VIDEOTONE - WHARFEDALE YAMAHA ETC.

UPTON ELECTRONICS
2 Churchill Court, Bolton Street, Brixham Devon TQ5 9DW. Telephone: 51893.
31 Torquay Road, Paignton, Devon TQ3 3DT. Telephone: 551329

DORSET

FORRESTER'S NATIONAL RADIO SUPPLIES LTD.

70-72 HOLDENHURST ROAD BOURNEMOUTH DORSET

Largest hi-fi and radio component store in the south Tel: 25232

ESSEX

SOUND SUPPLIES (Loughton) CO. LTD.

Telephone: 01-508 2715

HI-FI SHOWROOM

BROOKLYN PARADE, 309 HIGH ROAD, LOUGHTON, ESSEX

AFTER SALES SERVICE

SERVICE in ESSEX

Agents for:

TECHNICS • TANDBERG • MONITOR AUDIO • SONY • NATIONAL PANASONIC KOSS • NYTECH • LEAK • WHARFEDALE AIWA • BANG & OLUFSEN • PIONEER JRI49 SPEAKERS • PHILIPS VIDEO GRUNDIG • FULL RANGE OF TELEVISIONS

Home Demonstrations with pleasure.
Full range of Records and Tapes.

Kelleys Radio

BRENTWOOD 8 HIGH STREET. Telephone: 215519

CHELMSFORD 16-18 NEW LONDON RD. Telephone 66764

ROMFORD 8-9 SWAN WALK. Telephone 41808

SOUTHEND 92 HIGH STREET. Telephone 63991

LEIGH 1725 LONDON ROAD. Telephone 78258

HADLEIGH 265 LONDON ROAD. Telephone 556815

BASILDON 82 TOWN SQUARE. Telephone 21638

BRAINTREE 25 BANK STREET. Telephone 25930

GLOUCESTERSHIRE

CHELTENHAM

The Hi-Fi Shop for Gloucestershire

Agencies include
Tandberg, Sony, Aiwa, Grundig, Tannoy, Toshiba, Hitachi, Quad, Akai, Rotel, A.R., Revox, KEF, Yamaha etc.

Excellent Sales & Service

RAY ELECTRICAL LTD.,
287 High Street Tel 22317

AS the record companies, subject, like everybody else, to current economic stresses, devote an increasingly large percentage of their lists to reissues, they also seem to be exhibiting an increasing irrationality. From EMI, who usually like to present a sane and business-like front to the world, we have such records as **The Very Best of the Very Best** (EMI VBO101, £1.50). It is a special price sampler but it is difficult to imagine admirers of Shirley Bassey, Russ Conway, Jimmy Shand, the Treorchy Male Choir, Acker Bilk, Des O'Connor and Edith Piaf (to mention a few of the 'great artists' involved) finding unanimous enjoyment here. Of course, all the tracks (or most of them) are very good in their way. Perhaps there are enough people giving parties to a wide enough mixture of tastes to make it worth while—average [A: 1]. Similarly **Souvenir of the West Country** (One Up OU2174, £1.99) could, at least, give a most peculiar impression to tourists of what our West is like. The pseudo-bumpkinism of Adge Cutler and the Wurzels, Shag Connor and the Carrot Crunchers is indiscriminately mixed with Mrs. Mills, Acker Bilk, the BMC Concert Band, the Helston Town Band and, at the other extreme, Peter Dawson and Frederick Harvey in pseudo-Devon and Cornwall drawing-room ballads. Again, all excellent in their way, but what a mixture—[A/C: 1]. Two further albums of liquorice-allsorts are at least linked with some logic to recent books. From EMI **With An Independent Air** (EMI EMC3177, £3.35) is linked to the book by Howard Thomas (now Chairman of Thames Television and a veteran broadcaster) filling in the musical background to his radio encounters. To mention some of the names—Roy Fox, Mary Ellis, Henry Hall, Tessie O'Shea, Vera Lynn, Gracie Fields, Geraldo, Hutch, Evelyn Laye, Flanagan and Allen—this is the sort of nostalgic entertainment you will get from this collection; most of it delightful, most of it providing memories of the years 1937 to 1941, nicely transferred and re-mastered [H: 1/1*]. In somewhat similar vein from Decca **And the Bands Played On** (Decca 'Vintage' DDV5001/2, £3.99) a two-record album which goes with 'an informal history of British dance bands' by Sid Colin, dance-band musician and vocalist during the 30s and 40s. His selection dates from 1928 (Elizalde) to 1943 (Mantovani) and includes on the way such names as Ambrose, Cotton, Fox, Geraldo, Gonella, Hall, Hylton, Jackson, Kunz, Payne, Roy, Stone, Winnick—and so on—30 tracks that at least add up to a valuable collection all pointed in the same direction. A few tracks appear for the first time and this issue should attract many collectors. Again, excellent re-mastering [H: 1/1*].

Drew Taylor's **Drew's Brew**

LIGHT



Peter Gammond

(One Up OU2175, £1.99) has some excellent fiddling and vocals from the leader, good banjo, guitar, etc., from others, but is marred, for my taste, by a bit too much Moogery. Otherwise a fine album of skilled musicianship ranging from country folk to jazz [A: 1/2]. Karel Gott—**The Golden Voice of Prague** (Supraphon 53643, £2.75) is an album that ranges from tenor lyricism to jazz and beat; difficult to categorise. Gott has a pleasant light tenor voice, sings in English with a heavy accent, and demonstrates considerable versatility and skill. I suppose it falls into a Bennett-cum-Williams area on the whole and will thus appeal to a slightly older than pop audience [A: 1/2]. Miklos Rozsa conducts twelve sections from his score for **Ben Hur** (Decca 'Phase 4' PFS 4394, £3.35). It is all highly romantic, wheeling and surging music that soon lost my attention, but it will obviously have a great appeal for those who admire the art of Rozsa and have a special interest in *Ben Hur*. I am sure it is as well done as can be and the recording is good [A: 1].

For the brass band enthusiast there is a fairly serious concert of music on **City of Coventry Band in Concert** (Grosvenor GRS1053, £1.99). This includes Fletcher's *The Spirit of Pageantry*, Wright's *Overture for an Epic Occasion*, Sibelius' *Intermezzo from Karelia* and Sharpe's *Fanfare and Soliloquy*. There is some good interpretation but a slight lack of polish in the playing. The recording, though done in a studio, is slightly lacking in resonance which gives it that sort of dispersed outdoor sound [B: 1/2]. For the military band devotee **The Band of The Duke of Edinburgh's Royal Regiment** (Grosvenor GRS1056, £1.99), recorded in the same studio, has a much fuller and better sound. The programme is an interesting one, giving a sort of cross-section of the things that such a military band might regularly be called upon to play in the course of duty and pleasure, one side to each facet [A: 1].

THE second album by John McLaughlin's new band, Shakti, is an inspiring record. Its title, **A Handful of Beauty**, is not a boast. There is space and warmth on some tracks like the sad/sweet *India*, where Johnny Mac caresses his custom-built acoustic guitar to coax out of it the expressive sounds more often associated with the electric axe. His own playing has matured greatly since he gave up the Mahavishnu Orchestra combination. The Indian musicians in Shakti have perhaps cooled him out. They are unselfish players who seem to want to play what's right for the music rather than what's right for their egos. Violinist L. Shankar plays soulfully with fantastic skill and authority. The ensemble work—and especially that of the two Indian percussionists—is astounding in its accuracy and faultless precision. Somehow extremely difficult intricate lines come over naturally and, surprisingly, don't sound contrived. In short this is masterful joyous music. Don't try to categorise it—just get into it. It's on CBS 81664 [A: 1].

Another impossible to categorise album is the debut disc by **Voice**, Ogun Records OG 110 [C: 1/2]. The group consists of four singers—performing unaccompanied—Maggie Nichols, Julie Tippetts, Phil Minton and Brian Eley, and this record was made at a live gig I witnessed last Autumn. The nice thing about this band is that they sing like singers and do not attempt to use their voices to imitate a jazz rhythm section, for example. There is a surging vitality about their music which covers quite a wide area of expression from the most tender to the most insane. Voice are original. I've never heard any other group of singers sounding anything like them or attempting such a wide range of music. It's a great pity that the production didn't match this band's considerable talents.

When Sonny Rollins stepped onto the stage at the New Victoria, London, last year, I cried with frustration. Here was Mr Music, Mr Soul, Mr Jazz . . . one of the giants playing with a cocktail bar pianist, and other sidemen who weren't fit to share the same stage with the man. He was playing several of the pieces from **The Way I Feel** on Milestone 9074 [A/B: 2], most of which can be described as King Curtishish R&B numbers. I love that kind of thing—but from Rollins, Mr Melody, surely that's not the way he feels, really? Rollins' trouble is that he's set himself perhaps impossibly high standards. From almost anyone else, this would be a fair enough album, and you'd notice that the tenor player was particularly good. But from Rollins, this kind of commercial session-faced studio job is a disappointment. Having bitched that out, I have to admit that even Billy Cobham couldn't quite obliterate the

JAZZ



Ken Hyder

humanity and humble directness in Rollins' own playing. He can still make you weep for reasons other than frustration.

The Age of Ellington, RCA PL 42086 [H: 1*/1] is a three album extravaganza of the Duke's music from 1927 to 1967. I have to admit that it's only the last few years I've started to listen to Ellington—the swing of the Count pulled me in another direction. But having got into the Duke I've been overjoyed to discover what I've been missing. And it's all here . . . the soloists who sound as if they have a monopoly on melody . . . and the rich imaginative writing of Duke. The way he forged his own identity in big band music, and the way he put it all together with an ear for unusual voicings is the mark of his genius. This is a valuable collection, with a well produced information booklet as well.

Stan Tracey's **Under Milk Wood** RCA PL 25073 [A: 2] is a comfortable cosy album of sparkling straight ahead jazz and sit-back-and-listen narration of Dylan Thomas by Donald Houston. It's also a splendid production. Only the small print gives away the fact that the suite was recorded live, so clear and sharp is the production. In fact everyone involved gets it on, from the totally sympathetic narration from Houston to the dedicated driving force of Tracey's quartet of Dave Green, bass, Art Theman, tenor, and Brian Spring, drums.

Graham Collier's **New Conditions** is perhaps the best of his most recent albums. I found some of his earlier attempts at the freer end of jazz a bit effete, but now the approach is more mature. At times the twelve piece sounds cluttered, but there's lots of spirit and energy going on. It's on Mosaic GCM 761 [B/C: 2/3].

Flora Purim's newie **Nothing Will Be As It Was . . . Tomorrow** on Milestone N9075 [A: 2/3] is a disappointment. Her own albums have always been close to the edge of commercial pap. Up until now she's managed to avoid being too syrupy—often through having good session players. This time any excitement is lost in grandiose production.

Your Hi-Fi Dealer

HAMPSHIRE

FOR ALL YOUR HI-FI REQUIREMENTS



University AUDIO

**12 BARGATE STREET
SOUTHAMPTON Tel: 28547**
Also at CAMBRIDGE

- Comparator demonstrations
- Open Thursday until 8 pm
- Approved agents: Aiwa, Acoustic Research, Armstrong, B & W, Celef, Celestion UL, Chartwell, Decca London, Fons, Gale, Grace, Harman-Kardon, IMF, JRI49, KEF, Linn-Sondek, NAD, Nakamichi Centre, Pioneer, QED, QUAD, Sansui, SMC, Spondor, Sony, Stanton, J. E. Sugden, Supex, Tandberg, Tannoy, Teac, Technics, Trio Centre and Yamaha Centre.

Hampshire Audio Ltd

8 & 12 Hursley Road Chandlers Ford Tel: 2827 or 65232

HERTFORDSHIRE

RADIOLUX
The Premier
Hi Fi Centre
in Watford
108 The Parade, Watford. Tel. 29734
**Bang & Olufsen
Main Dealer**
**Technics Sony
Toshiba Skantic**
Established 22 years
Late opening Fridays 8.00pm
Closed all day Mondays

KENT

ASHFORD PHOTOCRAFT HI-FI

Opposite Top Rank, 40 High Street.
Tel.: Ashford 24441.

Acoustic Research, Armstrong, Bang & Olufsen, B & W, Celestion UL, Gale, KEF, Koss, Nakamichi, Quad, Rogers JR149, Revox, Stanton, Strathearn, Tandberg, Thorens, Trio, Toshiba, Yamaha.

Hi Fi Demonstrations and Installations

KENT

IN KENT your Hi-Fi Specialists are
Westgate Hi-Fi, 2 Station Road, West Canterbury
and

The Hi-Fi Shop, 43 High Street, Dover

If its exceptional quality, very reliable, nicely presented and good value for money, we sell it, and we still believe in personal individual attention before and after sales. Call in or telephone the enthusiasts at Canterbury 69329 or Dover 207562.

CANTERBURY

Your Hi-Fi Dealer

LANCASHIRE

AUDIO CORNER

117 Portland Street, Southport
Merseyside PR8 6QZ.
Telephone: 0704-37332.

Stockist for: Armstrong, B & W, Spondor, Quad, N.E.A.L., Sugden, Radford, Gale, Omal, Soundcraftsman, Tandberg, Trio, Harrison S200, Marantz, Monitor Audio, Richard Allan, B & N Radford Monitors, S.M.C., Toshiba, Ferrograph, Revox, Bose, Fons CQ30, Fisher, Leak, Teleton, Transcriptors. Barclaycards, Access, H.P., etc. Late night: Friday to 7.30. Parking available at all times.

STONE CROSS HI FI CENTRE

(GERALD CARTER)

MARKET PLACE,
GARSTANG, Nr PRESTON, LANCs.

Agents for: Sony, Toshiba, Telefunken, Tandberg, Harman Kardon, Aiwa, Sansui, Pioneer, Tannoy, Leak, Wharfedale, etc.

RECORD CLEANING SERVICE

Closed Wednesday afternoons

Telephone: 09952-3683

GREATER MANCHESTER

BOLTON

Specialists in
High Fidelity Sound

H. D. KIRK
Stereolectrics

203 St. George's Road
Phone 23093

BOLTON

WEST MIDLANDS

GRIFFIN RADIO LTD

(the high fidelity people)

Fullly comprehensive stocks and
advisory service for

Stereo and Quadraphonic High Fidelity,
Radio, Tape and Disc equipment.

94 BRISTOL STREET
BIRMINGHAM 5

021-643 4339
021-692 1359

BIRMINGHAM

FIVE WAYS HIGH FIDELITY

A.R., Armstrong Cambridge, Dual, KEF, LNB, Marantz, Mordaunt-Short, Revox, Spondor, Sansui, Tandberg, Thorens, Trio etc. always on comparator demonstration. Keen prices and good after sales service.

Finance available.

Open: Monday to Saturday 9.15-6.00.

12 ISLINGTON ROW, BIRMINGHAM 15.
BIRMINGHAM 021-455 0667

Ken Whittle Hi-Fi

A very personal shop, run by
Professionals, with your satisfaction and
pocket in mind.

788 STRATFORD ROAD,
SPRINGFIELD, BIRMINGHAM

Telephone 021-777 5964
(near Formans Road)

Part-exchanges welcomed

Your Hi-Fi Dealer

WEST MIDLANDS (continued)

MILLWARDS

Telephone: 23980

SALOP STREET, WOLVERHAMPTON

FOR SOUND ADVICE

SPECIALISTS IN QUALITY AUDIO
AND HI-FI

WE STOCK: ARMSTRONG, SONAB, B & O,
SONY, QUAD, MARANTZ, TANDBERG, LEAK,
etc.

HI-FI STUDIO

W. J. TAYLOR (DOMESTIC SUPPLIES) LTD.
128 Hawthorn Road, Kingstanding,
Birmingham B44 8QA. 021-373 2645

BIRMINGHAM'S BANG & OLUFSEN
MAIN DEALER

Also demonstrating Quad, A.R., Toshiba, Hitachi,
Sanyo, Jordan Watts, J.B.L. Quadraphonic by Toshiba
and National Technics.

MEMBERS OF
HIGH FIDELITY DEALERS ASSOC.

NORTHAMPTONSHIRE

PETERBOROUGH

Tel: 5644

CAMPKINS

All modern hi-fi equipment in stock
18 HERWARD CENTRE
LARGEST LOCAL STOCKISTS

CONSULTANTS (Peterborough)

Studio:— 13A Whitshed St, Peterborough.
Telephone: 51007.

Retailers of Quality Hi-fi Equipment

We offer: Demonstration facilities, Instal-
lation service, Sound advice, A competitive
price.

Agents for: A.R., B. & W., Monitor Audio,
Pioneer, I.M.F., Rotel, Revox and many more.

NOTTINGHAMSHIRE

For all your hi-fi requirements

JOHN KIRK

Hi-Fi and Colour TV
Specialist

139 Attenborough Lane, Attenborough, Notts.

Tel. 252988

Professionally planned
Audio Systems

OXFORDSHIRE

HENLEY-ON-THAMES

G. O. MOORHEN

HIGH FIDELITY SPECIALIST

190 READING ROAD, HENLEY. Tel. 4163

Appointed Agent for

Bang & Olufsen, Revox, Tandberg, Sony, Teac,
Garrard, K.E.F., Leak, Lowther, Quad, Shure, Spondor,
Thorens, Wharfedale etc.

Closed 1 p.m. Saturdays.

Positive Feedback

Rational Amplifier Testing

WE SEEM to live in a world where it is believed that all amplifiers sound different—that those differences do not correlate with specifications and that there is therefore some mysterious ingredient as yet undiscovered to account for these effects.

Of course, in the broadest sense amplifiers must sound different because if the reverse were true we could all purchase the cheapest on the market and still obtain the best possible performance. Nevertheless, the aura of magic and guesswork which surrounds the subject of power amplifiers in the popular press seems unnecessary and undesirable because proper investigation has never yet failed to produce completely rational explanations for any apparent subjective discrepancies.

As one would expect, a number of obscure effects fail to materialise when the test is repeated under controlled conditions. A further batch can be directly attributed to insufficient attention to detail in the test set-up. There remain, however, a significant number of differences due to amplifier design faults not readily obvious from the published specifications.

These specifications for power amplifiers have an historic background, traceable to the early half of this century where they evolved with the intention of highlighting those areas where amplifiers of that vintage had gross problems. Even the specification in terms of power dates from the days when a tapped transformer was used to match the generator to the load for maximum transfer of energy. A more appropriate rating today would be in terms of output voltage complemented by a figure for maximum current and phase angle.

Most certainly it would be possible to derive an additional set of figures to describe the performance of an amplifier in greater detail, but whether this would help or further confuse the customer is highly debatable. Such additional figures would in any case take years to seep through the various standards committees, and indeed it would only be by prolonged usage that general agreement on their relative importance became established.

Fortunately for our present purpose of establishing rational explanations for subjective phenomena, it is not necessary to introduce new parameters. We can use a process of elimination progressively narrowing down the area of search in much the same way that is used in the popular parlour game Twenty Questions. Thus if there were 500 possible causes it is only necessary to ask nine questions ($2^9 = 512$) to arrive at the answer.

Let us start by assuming that a power amplifier should act like a 'straight wire with gain', since this concept is readily comprehensible to all. It assumes that the power

amplifier should do nothing except amplify. A 'straight wire with gain' is, of course, a figment of the imagination so that in practice one compares the amplifier under test together with its load, followed or preceded by an attenuator equal to the gain of the amplifier. This is auditioned and compared with a direct connection bypassing the amplifier/attenuator circuit.

A competently designed amplifier of top quality should pass such a comparison test with no detectable difference. Were we to be challenged, we would have no hesitation whatsoever in staking our reputation on such a test with a 303 or 405 without reservation. Without reservation? Yes, but not without specifying a number of very relevant conditions. At this point the sceptic might insist that surrounding the test by such conditions largely invalidates it, but this is not so. It is merely a means of progressive elimination. None of the conditions, for example, introduces non-linearity into the 'straight wire', so that all distortions of this type are present in the differences to be compared: amplitude distortion, harmonic distortion, intermodulation, Uncle TIM Cobley and all.

After the successful conclusion of such a test each of the conditions in turn can be removed and its effect noted. It is consideration of these conditions that is likely to reveal the cause of unsuspected anomalies in previous tests of this sort.

What are these conditions?

(1) The challenger would have free choice of loudspeaker to load the test amplifier and free choice of tape, record or radio program material, but he or she would not be permitted to use random noise or artificial waveforms as a source. (Random noise, unlike program material, does not have a finite peak/mean ratio and is an unsuitable source unless peak and spectrum limited. It is possible to produce highly artificial waveforms, the sound of which changes if the phase relationship of its components changes. On the other hand, no-one has yet shown that quite large phase-shifts can be detected on program—not to be confused with relative phase-shifts in the two channels of a stereo system. Furthermore, it is largely irrelevant to assess an amplifier by using artificial signals which exceed by a gross margin the rise-time or passband of any possible program material.)

(2) The 'straight wire' shall have the same passband as the amplifier under test. (The sound of a loudspeaker, particularly of the phase inverter type, is very sensitive to the presence of unwanted frequencies below resonance. Any change in frequency response in this region far below the audio range can produce audible changes within the audio range.)

(3) The 'straight wire' shall have the same terminal impedances as the amplifier under test. (This is to ensure that the input and

output conditions are identical and therefore affect the test set-up in the same way.)

(4) The amplifier shall at no time be allowed to operate beyond its specified clipping level. (This hardly needs comment. If a high quality amplifier operates into clipping in normal use there is only one proper answer—a bigger amplifier.)

(5) The challenger is required correctly to identify differences between the two sounds a sufficient number of times to be statistically significant. (Obvious.)

There are two important areas which we have not yet mentioned. The first of these is the validity of A/B testing. It is possible for some types of distortion to be undetected on direct instantaneous comparison yet become significant on extended listening. Experience and indeed common-sense indicates that these distortions are present at just below detectability in the A/B test. This being so, a little electronic wizardry can bring this to light and so reduce the time scale. It is possible to extract the A/B difference into a separate circuit and a proportion of this is added back into the amplifier/attenuator chain. In this way one compares the two sounds with the differences multiplied—by a factor of 10 (or more if desired).

The second area is concerned with the fact that some distortions can *enhance* the reproduced quality. A typical example of this is the adding of random noise to mask quantising noise. Another is the generation of harmonics (but not intermodulation) at low frequencies which will enhance the bass that was perhaps otherwise lacking. It might appear that all this group of effects depend upon the program being pre-distorted in some way or another, but this is not necessarily so. Nevertheless such 'improvements' would seem to be undesirable if permanently built into a power amplifier. It is for this reason that we prefer a comparison with the 'straight wire with gain' rather than ask 'Is amplifier A better than amplifier B?' even though the customer in the end may wish to know the answer to the second question.

Although not exhaustive, enough has been said to make the point that a proper system of elimination will usually reveal the truth. If there are some cases that are still puzzling, then a more elaborate comparison along the amplified differential line indicated will surely reveal all.

With the dawning comes the daylight. The gnomes, the fairies and the bogeymen fade away or turn into more concrete and familiar objects with which we are more competent to deal.

P. J. WALKER
*The Acoustical Mfg. Co. Ltd.,
Huntingdon.*

to p. 137

Letters on technical matters, preferably concise, are welcome. If not for publication, they should be clearly marked.

Your Hi-Fi Dealer

SALOP



Sophisticated comparator demonstrations of all leading brands of Hi-Fi equipment at competitive prices. Lux-Sugden-Marantz-Teal-Pioneer-Spendor-Rogers.

SPECIALIST SOUND SYSTEMS

CLAREMONT HILL SHREWSBURY.
TEL 57684

SOMERSET

Yeovil Audio

Hi-fi specialists

AR ARMSTRONG AIWA B & W DUAL IMF
KEF KOSS LINN MORDAUNT-SHORT PIONEER
QUAD SONY STRATHEARN TANDBERG TEAC
TECHNICS TRIO YAMAHA

8 Wyndham Street Yeovil Somerset BA20 1JJ
Yeovil 25430

EAST SUSSEX



Complete Audio Systems Ltd

We are the leading specialists for Hi-Fi in the South East offering expert service and personal attention, something which is generally lacking these days. All leading makes are on comparator demonstration in our large, friendly showroom, while hire purchase and exchange facilities are always available.

32 Grove Rd EASTBOURNE. Tel (0323) 27362
36 High St ROTTINGDEAN. Tel (0273) 31082

WEST SUSSEX

The most respected names in hi-fi are here

BOWERS & WILKINS

WORTHING

Littlehampton Road · Tel. Worthing 64141

HARFIELD & FORSTER
63 LONDON ROAD
BOGNOR REGIS
5206

NAKAMICHI
YAMAHA
AIWA
KEF

Hi Fi

MARANTZ
TECHNICS
J.V.C.
KLH

KENSONIC
LABS

COMPARATOR DEMOS

Your Hi-Fi Dealer

WEST SUSSEX (continued)

PERSONAL SERVICE AT

KEN DEAN

MAIN AGENTS FOR
Hitachi, Lux, National Panasonic, Toshiba,
Trio, Videotone, B & W, Celestion, A & R,
Mordaunt Short, Tannoy, Sony etc.

112/114 ST JAMES STREET, BRIGHTON
Phone: 0273 61550

SOUNDS SUPREME

Agents for: Yamaha, Lux, Strathearn,
JVC, KEF, Monitor Audio, Videotone,
Sansui, Trio, Nightingale and many others

136 PORTLAND ROAD,
HOVE, SUSSEX
Telephone: Brighton 723399

SCOTLAND

Audio Engineers,
Hi-Fi Specialists,
Gramophone
Records,
Tapes, Cassettes



98-110 WOODLANDS RD., GLASGOW, G3 6HB
041-332 0988

Glasgow's leading specialists in High Fidelity Audio Equipment and Classical Records.
Our policy is to be selective rather than comprehensive, yet we have permanently on demonstration the finest range of audio equipment in Scotland.

Russ Andrews High Fidelity

34 Northumberland Street,
Edinburgh 031 557 1672

HEREFORD & WORCESTER

MALVERN LINK

RALPH HALES HI-FI CENTRE

B & O, QUAD, TECHNICS NATIONAL,
HACKER, IMF, SONY, TANDBERG, KEF,
GRIFFIN, MORDAUNT-SHORT, SUGDEN.

Specialist advice and demonstration facilities

154 Worcester Road, MALVERN 4433

It helps to mention
HI-FI NEWS
when replying to
ADVERTISEMENTS

Your Hi-Fi Dealer

TYNE & WEAR

THE NORTH'S ORIGINAL HI-FI
SPECIALISTS

STEREO SOUND STUDIO AND RED RADIO SHOP

11 OLIVE ST. off PARK LANE,
SUNDERLAND 72087.

Appointed main agents for—
Accutrack, Aiwa, BIC, BSR, Bose,
Castle Acoustics, Dual, Harrison, Har-
man Kardon, Hitachi, JVC, Kef, Luxman,
JBL, Linn, Mordaunt Short, NAD,
NEAL, Pickering, Revox, Studiocrft,
Spendor, Teac, Trio, Tannoy, etc., etc.

All accessories and component parts

Demonstrations with pleasure

Superb after sales service

YORKSHIRE

THE HUDDERSFIELD HI-FI CENTRE

8 Byram Street, HUDDERSFIELD.
Telephone: 44668

THE BRIGHOUSE HI-FI CENTRE

24 Commercial Street, BRIGHOUSE.
Telephone: Brighouse 79606

Personal attention, home demonstrations,
competitive prices, 2 demonstration studios,
headphone bar. We stock:

Aiwa, Armstrong, AR, B & W, Cam-
bridge, Connoisseur, JVC, KEF, Koss,
LNB, Monitor Audio, N.E.A.L., Pioneer,
Quad, Revox, Richard Allan, Sennheiser,
Sansui, Sony, Stanton, Strathearn,
Shure, A. R. Sugden, J. E. Sugden,
Tandberg, Technics, Toshiba, Trio,
KMAL Record Cleaning Service.

SHEFFIELD SOUND CENTRE

Guaranteed never undersold
Mail order customers welcomed

Main agents for: Accuphase, Fisher, Spen-
dor, Teac, A.R., J.B.L., Marantz, Sony, Arm-
strong, K.L.H., Quad, Cambridge, Uher, Tan-
noy, Pioneer, N.A.D., Wytech, Rogers, Revox,
Tandberg, Trio, Videotone, J.V.C., B & O,
Neal, Nikko, Lux, Mordaunt Short, H.K.,
Scandyna, Ariston, I.M.F., B.I.C., Leak, Ferro-
graph, Aiwa, Sonab, Radford, Amcron,
Hitachi, Sugden, Strathearn, Omal, Direct
Design, Fons, Grundig and Dalesford, etc.

Appointed Technics Centre
Philips Audio and Video Equipment

Demonstrations, Terms and Part Exchanges

101a & 107 ECCLESALL ROAD,
SHEFFIELD S11 8HY.
Telephone: 0742-23365.

Disc v. Cassette: The Decca View

WITH REFERENCE to Angus McKenzie's article *Cassette v. Disc—Part 1* which appeared in the May issue, we would comment as follows:

(1) The implication that consumer pressure has forced manufacturers of pre-recorded cassettes to use 'better tapes' is entirely wrong in our case. On the contrary, we have always endeavoured, and shall continue our endeavours, to improve the performance of cassettes. The improvement in quality has certainly not been due to improvement in tapes only—record heads and increased know-how of duplication and assembly techniques have played a major part in improving quality, not only just 'fairly recently', but continuously over the years.

(2) The quest for greater dynamic range is fine for people with superb hi-fi equipment in a detached house located in the middle of a large empty, silent field. The majority of listeners, however, are people with modest to good reproducing equipment living in a flat or semi-detached house with neighbours and a fairly high ambient noise level.

(3) Differences in the balancing of original recordings from different manufacturers are not relevant to *Cassette v. Disc* comparisons.

(4) We do not engage 'in misguided attempts to reduce the dynamic range' when manufacturing pre-recorded cassettes, but endeavour to use the medium to the best advantage. Please also refer to point 2 above.

(5) The cost of tape in a cassette is rather higher than that mentioned in the article and varies with program time.

(6) Our peak level of recording on cassettes has been established to optimise the following conflicting requirements:

(a) Acceptable distortion at mid-frequencies.

(b) Acceptable high frequency response.

(c) Acceptable signal/noise ratio.

(7) The following points need to be made regarding BASF calibration tapes:

(a) The measured recorded tape flux is a function of the method of measurement employed.

(b) The present method of measurement employed has been well established for over eight years, and has resulted in the manufacture of BASF calibration tapes, the flux of which is claimed to be well within the tolerances specified in DIN 45513/6, when measured by the established method.

(c) Any proposal to change the present method of measurement of tape flux is totally unacceptable because:

(i) The present recording characteristic of 3180/120 μ s measured in accordance with established practice is correct and serves as an Industry Standard for most European prerecorded cassette manufacturers. Any change in that standard will cause serious incompatibility between new cassettes and existing players.

(ii) A change in the method of measurement of tape flux has neither technical nor commercial advantages.

(iii) New magnetic heads with improved high frequency response can and should be equalised to the present characteristic in

order to achieve improved signal/noise ratio from cassette machines.

(d) Any calibration tape used in the manufacture of pre-recorded cassettes must conform to a recognised standard and must be guaranteed to be within the tolerances specified by that standard. Such a guarantee is essential, since most users of calibration tapes do not have facilities to measure tape flux in accordance with a recognised standard. BASF calibration tapes are *not* made to a BASF standard but in accordance with DIN 45513/6, the German National Standard. The implication that the Japanese National Standard interprets the 3180/120 μ s characteristic more accurately than the German National Standard is based on the assumption that the Japanese method of measurement of tape flux is preferable to the established German method. We do not agree with this assumption for reasons given under 7(c) above.

8. Comparisons of *Cassette v. Disc* are valid under the following conditions only:

(a) The frequency disc used for setting up the equipment and the resulting frequency response after corrections and equalisation must be stated.

(b) The calibration tape used for setting up the equipment and the resulting frequency response after corrections and equalisation with Dolby-B decoder inoperative must be stated.

(c) The Dolby-B decoder used in conjunction with the cassette deck must be beyond reproach.

(d) After disc equalisation and cassette decoding the *same* replay chain must be used.

(e) Since the disc is a variable distortion medium, the radius at which the disc is played during comparisons must always be stated.

(f) The gain controls after disc equalisation and cassette decoding should be so set as to result in identical peak levels from the two media, and the noise generated from each system in the playback mode at these settings with zero input should be stated.

G. M. NATHAN

Technical Manager,
Tape Products Division,
The Decca Record Co. Ltd.

Note: Mr. McKenzie will reply to points in the above and following letters next month—Ed.

Compact Cassette Standards

We would refer to the article by Angus McKenzie published in the May issue of HFN/RR under the title *Cassette Versus Disc*. In this, the author makes some remarks with respect to the DIN calibration tapes for the Compact Cassette system which might confuse readers who are not in a position to check his statements. Since the prolonged good reputation of our calibration cassettes has been put in doubt, we feel it is our right to re-establish that reputation.

As a matter of fact we were deeply involved in the establishment of the original short-circuit-flux versus frequency response of the Compact Cassette system, as well as the basic measurements which found practical expression in calibration tapes. Also, we chaired the working group within the IEC

which was responsible for the standardisation of IEC calibration tapes, including those for the cassette system. Needless to say, we were involved in the establishment of the DIN calibration tapes, in collaboration with Philips and others.

From this situation, we believe that it is not only our right, but also our duty to inform you and your readers about the 'facts behind the facts', and to oppose strongly the very personal views of Mr. McKenzie. But before coming to details, we would like to calm those readers of the article who suffered from the bad feeling that up to now everything in the cassette system must have been a mess.

In particular, the situation concerning standardisation, including the replay frequency response, is as good as in any other established recording system. This is thanks to the excellent decision of the inventor of the Compact Cassette system, Philips, to couple licensing with standardisation agreements in which the licensee is obliged to follow the standards originally released by Philips and later represented by IEC and DIN. These standards include the replay frequency response definition, represented by authorised calibration tapes. Fortunately, the establishment of the flux frequency response calibration tapes for the cassette system was based on far more serious measurements and considerations than the reasons which Mr. McKenzie has for proposing a change in the world standard.

The Facts

Why Calibration Tapes

If replay heads were or could be ideal, it would not be necessary to have calibration tapes. The EMF voltage from such heads would be a precisely known function of flux versus frequency response of the tape, and as a consequence it would be enough to build in the calculated correction in the replay circuitry. Of course the reality is very different: apart from the fairly precise calculable or measurable deviations—such as effective gap length, electro-magnetic losses and pure electrical losses—a number of other variables cannot be determined in an accurate way.

Here we mention: The shape of the gap and the pole tips; the homogeneity of the magnetic permeability, right from the surface contacting the tape into the core; and last but not least, the effective distance between the head surface and the tape surface, due to the surface roughness of the replay head. In addition, the roughness of the tape surface is a further variable which contributes to the unknown effective distance between tape and head. An ideal tape should have an infinitely thin coating and an infinitely smooth surface, which is impossible of course.

As a result of such practical limitations, all heads deviate from the ideal head by varying amounts, causing unknown losses, especially at short wavelengths (high frequency, starting as low as 2 kHz at cassette speed). These are the main reasons why, in practice, calibration tapes or calibration heads are required. As it is much easier to produce many test-tapes which generate equivalent EMFs at all frequencies when replayed via one head, than it is to make many heads which produce equivalent EMFs at all frequencies from a

Your Hi-Fi Dealer

YORKSHIRE (continued)

QUADRAPHENIA HI-FI CENTRE

Agents for Akai, Armstrong, Celestion, Castle Fons, J.V.C., Leak, Pioneer, Mordaunt-Short, Nytech, Rotel, Sennheiser, Sansui, Videotone, Toshiba, Ultimo and Wharfedale.

★ Instant credit if you have credit or bankers card (£100 min £300 max)

★ Big Discounts

10 NURSERY ST.
SHEFFIELD Tel (0742) 77824

WEST YORKSHIRE



of Bradford

Open 6 days (Thurs, 7.30)

Telephone Bradford 31648.

2 Demonstration Rooms—Always 60 speakers on demonstration.

Sony, B & O, B & W, Revox, Uher, Quad, JBL, KEF, Bose, R. Allan, Linn, Dual, Teac, Tandberg, Cambridge, Videotone, J. Sugden, Tannoy, Celestion, Nakamichi, A-R, Zerostat, Yamaha, Castle.

★ We exchange and buy for cash (cameras too!).

Northgate (off John Street), BRADFORD
BD1 3JR.

BARCLAYCARD — ACCESS — CREDIT

DEALER PANEL ADVERTISEMENT SPACE

costs as little as
£14.00 per month
for a series of 12,
or **£15.00** per month
for 6 insertions.
For further details
of full display
advertising rates
contact:

Douglas Shuard

The Advertisement Manager

HI-FI NEWS & RECORD REVIEW

Link House,
Dingwall Avenue,
Croydon CR9 2TA
tel: 01-686 2599

Badger Sound Services Limited



A comprehensive service for the speaker builder
with magazine designs on demonstration!

SONAUDAX IS HERE

These superb drive units have been adopted by some of the most respected names in speaker manufacturing.

We are delighted to be able to offer the complete range to the home constructor together with crossover networks and associated components and materials.

Our current catalogue (30p post free, overseas £1) contains full specifications together with enclosure drawings of the Sonaudax systems so successfully demonstrated at the Heathrow Audio Fair.

EXPORTS WELCOME

Callers welcome: 9-6 Tues. to Sat.
Closed all day Monday. **Do it yourself speakers on demonstration including the HFN DALINE, HI-FI ANSWERS MONITOR, PRACTICAL HI-FI PRO9TL.**

ACCESS orders taken by phone.



BADGER SOUND SERVICES LTD.

38A St Andrews Road South,
Lytham St Annes, Lancs. FY8 1PS.

Telephone: St Annes 729247.

STD CODE 0253

(Closed all day Monday)

Pickups & Cartridges

191 CHASESIDE, ENFIELD, MIDDLESEX
Tel.: 01-366 5015

Prices include postage and VAT at 12½%
E & OE. (British Isles only)

ADC

Cartridge
including
stylus

	Stylus only	
QLM 30	£10.75	£6.50 (RQLM 30)
QLM 32	£14.25	£9.25 (RQLM 32)
QLM 36	£18.00	£10.75 (RQLM 36)
VLM 11	£22.25	£13.25 (RVL)
XLM 11	£27.50	£15.50 (RXL)
Super XLM	£39.00	£23.50 (RZL)

AKG

P8ES	£59.00	£35.50 (x8s)
P7E	£26.50	£14.25 (x7E)

DECCA

Deram	£5.50	£1.65 (Blue)
Deram Elliptical	£7.00	£2.75 (Gold)

EMPIRE

2000E/III	£18.50	£14.50 (S2000E)
2000Z	£57.50	£33.00 (S2000Z)

ORTOFON

VMS20E	£29.75	£21.75 (D20E)
M15E Super	£49.00	£25.50 (D15E)
MC20	£58.95	Stm 72 trans.
SL20E	£51.25	£21.00

SHURE

M3D	£5.35	£4.50 (N3D)
M44-7	£6.75	£5.50 (N44-7)
M44E	£7.25	£6.05 (N44E)
M55E	£8.15	£7.05 (N55E)
M75-6S	£7.25	£6.05 (N75-6)
M75BII	£10.25	£6.85 (N75BII)
M75EJII	£12.75	£8.90 (N75EJII)
M75EDII	£15.00	£12.60 (N75EDII)
M95EJ	£13.00	£9.95 (N95EJ)
M95G	£12.25	£8.95 (N95G)
M95ED	£19.00	£16.50 (N95ED)
M24H	£29.50	£19.00 (N24H)
V15III	£44.25	£17.00 (VN35E)

Shure 78 rpm stylii

M44/M55 series	£6.75 (N44-3)
M75 series	£6.75 (N75-3)
M95 series	£7.75 (N95-3)
V15III	£19.50 (VN78E)

STANTON

500A	£15.00	£9.50 (D5107A)
500EE	£21.00	£15.00 (D5100EE)
681EEE	£48.00	£26.50 (D6800EE)

N.B.—All items are genuine branded products
in manufacturers packing.

To Pickups & Cartridges 191 Chaseside, Enfield, Mdx.

Please send the following items by return post
(Recorded Delivery).

Qty.	Make	Type	Cost

I enclose a Cheque/Postal Order made payable
to Pickups & Cartridges for £.....

Access/Barclaycard No.

Name.....

Address.....

(N7)

single tape, it is common usage to standardise the calibration tapes to ensure exchangeability of recorded programs.

However, we hope it is clear that the theoretical flux versus frequency response of such calibration tapes can only be an approximation to the actual effective flux response, due to the unknown parameters listed above. Also, it will be clear that calibration tapes can only be made in practice on the basis of carefully selected calibration replay heads, the properties of which approach the ideal as nearly as possible. How near, however, is always a guess. The complexity of unknown losses means that the final stage of establishing calibration tapes is always a decision to produce a 'flat' frequency response when used with the 'golden' reference heads of the system.

Calibration Tapes for the Compact Cassette

In the procedure followed to establish calibration tapes for the Compact Cassette system, all the steps followed a logical sequence. The best heads available in those days were selected 'ferrite heads'. The short wavelength EMF of these heads was the highest, thus being nearest to the ideal, while the long-term stability was exceptional: they still produce exactly the same frequency response as when the basic measurements were made. Finally, the decision was taken that calibration tapes represent the replay frequency response of the cassette system, and may be used as part of the standard. From the moment such a situation is reached, any further discussions about how near or how far away one is, or should be, from the theoretical flux response, is nonsense, provided all participants within the system are indeed following the agreed standard.

We would like to state that BASF cassette calibration tapes were and are within tolerances even closer than the DIN standard requires, equal to the definitive calibration tapes based on the reference heads for the Compact Cassette system.

Standards of the Cassette System

Mr. McKenzie writes about 'Japanese Standards' and suggests that they are different from the international IEC standards, the German DIN standards, and the original standards of Philips. According to our experience there seems little reason for this view, because in their publications many Japanese companies still refer to the Philips standards or even to DIN. The standard, of course, includes the definition of the replay chain, represented by authorised calibration tapes (Philips and BASF among others).

As a practical response, the Japanese industry bases its products in principle on the authorised calibration tapes. From our measurements we learned that the home-produced Japanese calibration tapes (TEAC) are also within close tolerances, equal to BASF-DIN and Philips. Contrary to Mr. McKenzie's assertion, TEAC tapes even show a slightly *higher* level at high frequencies than Philips or BASF-DIN! This observation was confirmed by Mr. Toshimitsu, Chief Engineer of Canon.

Mr. McKenzie observed that Japanese decks show a lift at high frequencies if BASF-DIN

calibration tapes are used. He considered his observations to be representative of the whole Japanese industry which, he said, stands for 80% of the world's cassette equipment. According to his market research he recommends everybody, including the inventor of the system, to follow the error of these Japanese decks and to 'flatten' the frequency response! Nice, if it is that easy, but our measurements on many Japanese decks do *not* confirm Mr. McKenzie's observations. Usually they are flat within reasonably good tolerances if authorised calibration tapes are used.

From our work in various IEC committees and working groups, we would also like to state that co-operation with our Japanese colleagues, especially in the field of Compact Cassettes, is most fruitful. There is not the slightest indication that the majority of the Japanese cassette industry might like to drift away from the standard agreements with the inventor. Such a trend could infringe the conditions of the licensee.

Summing Up

The Compact Cassette System was invented in Europe. The inventor gives free licences on condition that the licensee follows the standards, which ensure compatibility and exchangeability of cassette recordings. In the case of the standard replay frequency response, this is represented by authorised calibration tapes, BASF amongst others.

The calibration tapes were based on practical measurements and decisions.

There can be no illusions that they exactly represent theoretical flux response, due to unknown parameters described in this letter; but the decisions allowed the system to develop. The Japanese have no definite standards and their calibration tapes are very near to the authorised ones. Their (slight) deviation is generally the opposite of that which Mr. McKenzie claims.

The idea of changing this reasonably good situation (affecting a world standard) just because *some* Japanese decks show a lift in the frequency response if authorised calibration tapes are used for reproduction, is absurd.

We do not blame the author for not knowing these facts. However, we think it highly irresponsible to influence readers who cannot know or check the facts on their own by trying to distort the situation in order to promote a private opinion. If Mr. McKenzie has serious grounds for trying to change anything in any tape recording system, he is in a position to bring it before the British Standards body. If the majority of members (including the very important British music industry) share his views, the matter will very soon reach the IEC groups responsible, where steps can be decided upon. This is the only possible and correct way to discuss such important matters.

W. ANDRIESEN,
Chief Applications Engineer, BASF,
Aktiengesellschaft,
67 Ludwigshafen am Rhein,
West Germany.

Readers' Problems Examined by Crossover

Tape Path Slippage

Dear Sir, When operating my Sony tape deck, the tape keeps 'escaping' between the pinch roller and capstan. This trouble occurred most frequently with the leader tape, but also on occasions with the magnetic tape proper. I suspected a distorted tape or leader tape section, but changing these gave no improvement. A service by my dealer failed to solve this problem. Can you help?

E. S. P., Stockport, Cheshire

A reader with a similar problem has suggested the answer. Suspecting that the tape guides had become maladjusted, he checked the alignment but this did not help. However, during these checks, it was found that by very slightly increasing the pressure on the plate carrying the pressure pad cured the fault.

On close examination, it was found that the pad was not only in the wrong position but an oblong rather than a square pad was put on the plate. The snag now appears to be cured and the tape in transit does not ride up above or below the pinch wheel.

Adding Bass Unit to Existing LS

Dear Sir, Can you give me your views and advice on the following: I own a pair of fine

Spendor BC1s, with which I am very pleased, but I would like to extend the extreme bass by utilising a couple of 15 in. Baker Auditorium units that I have. These could be in transmission line enclosures, crossing over to the BC1s at about 300 to 400 Hz. Can you suggest a design for the necessary crossover, perhaps with a variable attenuator?

**S. W. A., Edenvale 1610, TVL,
South Africa**

We don't really think this is a very good idea. It might well increase your bass response, and at the same time thoroughly viliate its quality! We are by no means sure that the 15 in. Bakers are the right adjuncts to the Spendors, and the design of dividing networks to do justice to speakers of high quality is a time-consuming and protracted process which requires special facilities, knowledge, and/or a great deal of patience. Even if we had the units available, we could not undertake it, nor instruct you how to proceed.

A DO-IT-YOURSELF kind of man
Made a speaker exactly to plan,
But he lost his composure
When the finished enclosure
Contained Ethel his wife, in a jam.

Ronald Shaddick

AMPLIFIERS

Akai	
AM 2200	£82.78
AM 2400	£124.53
Amstrad	
2000 Mk III	£41.85
8000 Mk III	£29.50
HARMAN KARDON	
A401, A402	P.O.A.
Citation 1 1/2 D/Luxe	P.O.A.
Citation 11	P.O.A.
Citation 16	P.O.A.
J.V.C.	
JAS 11	£72.00
JAS 31	£104.00
JAS 71	£260.00
Leak	
3900 A	£254.39
Marantz	
1030	£75.46
1060	£122.53
1040	£118.79
1070	£148.67
140	£197.24
3200	£132.00
National	
SU 2300	P.O.A.
Pioneer	
SA 5300	£60.00
SA 6300	£80.00
SA 7300	£123.25
SA 7500	£175.95
SA 8500	£200.00
SA 9500	£268.65
SA 9900	£398.75
Rotel	
RA 212	£56.50
RA 312	£66.00
RA 412	£86.00
RA 712	£104.00
RA 812	£149.00
RA 1312	£268.00
RA 1412	£350.00
Sansui	
AU 2900	£72.00
AU 3900	£98.00
AU 4900	£125.00
AU 5900	£161.00
AU 7900	£223.00
AU 9900	£385.65
Sony	
TA 70	£49.50
TA 88	£57.00
TA 1630	£80.50
TA 2650	£107.95
TA 3650	£146.00
TA 5650	£224.00
Technics	
SU 3500	
SU 7300	
SU 7700	
SU 8600	
SU 9600	
SE 9600	
Yamaha	
CA 410	£100.70
CA 610	£135.00
CA 810	£251.75
CA 1010	£335.80
CA 2010	£419.50

TUNERS

Akai	
AT 2200	£79.37
Amstrad	
3000	£41.85
J.V.C.	
JTV 31	£92.00
JTV 71	£160.00
Harman Kardon	
Citation 15	P.O.A.
T 403	P.O.A.
Leak	
3900T	£212.00
Marantz	
104	£99.64
112	£142.92
125	£204.71
150	£344.00
Pioneer	
TX 7500	£139.85
TX 9500	£193.35
Rotel	
RT 224	£62.00
RT 324	£78.50
RT 624	£116.00
RT 724	£94.00
RT 824	£147.50
RT 1024	£257.95
Sansui	
TU 3900	£100.00
TU 5900	£150.00

TU 7900	£173.00
TU 9900	£283.48
Sony	
ST 2950F	£97.50
ST 3950	£139.50
ST 5950SD	£215.90
ST 4950	£136.00
Technics	
ST 3500	
ST 9600	
Full range available	
National	
TU 2300	P.O.A.
Yamaha	
CT 410	£96.50
CT 610	£134.50
CT 810	£159.50
CT 1010	£193.00

RECEIVERS/TUNER AMPS

Akai	
AA 1010	£122.00
AA 1020	£149.50
AA 1030	£167.54
AA 1050	£270.00
Amstrad	
5050	£87.00
Harman/Kardon	
330C	£157.50
430	£198.00
730	£288.00
J.V.C.	
JRS 100	£123.00
JRS 200L	£205.00
JRS 300	£248.00
JRS 400	£330.00
JRS 600	£416.00
Leak	
3200	£154.39
3400	£193.46
Marantz	
2215B	£118.04
2225B	£172.22
2230	£222.42
2235	£273.67
2240	£281.97
2250	£356.76
2275	£442.00
2325	£511.04
National	
SG 25Q	£118.95
Pioneer	
SX 300	£78.00
SX 450	£118.00
SX 550	£142.75
SX 650	£200.25
SX 750	£238.25
SX 850	£317.95
SX 950	£365.00
SX 1250	£560.00
Rotel	
RX 202	£104.00
RX 402	£138.00
RX 602	£167.27
RX 802	£210.47
RX 7707	£162.50
RX 1603	£499.00
Sansui	
221	£94.00
331	£105.00
5050	£190.00
6060	£228.00
7070	£309.00
8080	£358.00
9090	£406.00
Sony	
STR 1800	£103.50
STR 2800	£134.15
STR 3800	£151.85
STR 7035	£160.95
STR 4800	£200.95
STR 5800	£250.95
STR 6800SD	£298.00
Technics	
SA 5060	
SA 5160	
SA 5360	
SA 5460	
SA 5160L	
Yamaha	
CR200E	£117.50
CR 620	£218.20
CR 820	£285.30
CR 1020	£360.80
CR 2020	£461.20

CASSETTE DECKS

Aiwa	
AD 1250	P.O.A.
AD 1600B	P.O.A.
AD 1800	P.O.A.
AD 6300	P.O.A.
AD 6500	P.O.A.

Amstrad	
7070	£92.00
7050	£75.00
Akai	
CS 705D	£139.90
CS 707D	£165.95
GXC 740D	£307.00
GXC 760D	£386.00
GXC 310D	£138.80
GXC 710D	£185.27
GXC 75D	£192.95
CS 34D	£89.95
GXC 39D	£137.95
J.V.C.	
CD 1740	£86.00
KD 21	£116.75
CD 1635 Mk II	£192.00
CDS 200B	£173.00
CD 1970	£204.00
CD 1770	£199.00
Marantz	
5120	£159.00
5220	£195.74
5420	£259.74
Pioneer	
CT 2121	£134.95
CTF 6060	£170.00
CTF 7070	£190.00
CTF 8080	£230.00
CTF 9191	£276.25
Rotel	
RD 12F	£156.00
Sansui	
SG 2000/2	£144.00
SG 3000/3	£172.00
Sony	
TC 118	£97.50
TC 135SD	£122.00
TC 136SD	£135.89
TC 138SD	£171.00
TC 153SD	£177.80
TC 158SD	£158.20
TC 186SD	£129.54
TC 204SD	£154.95
TC 206SD	£172.75
TC 229	£227.80
TC 177SD	£393.70
EL 5	£292.00
EL 7	£444.00
Teac	
A 400	P.O.A.
A 420	P.O.A.
A 440	P.O.A.
A 650	P.O.A.
PC 10	P.O.A.
Technics	
RS 263 AUS	
RS 273 US	
RS 640 US	
RS 610 US	
RS 615 US	
RS 630 AUS	
RS 671 US	
RS 676 US	
Harman/Kardon	
HK 2000	£225.00
Yamaha	
TC 5115	£134.20

REEL TO REEL DECKS

Akai	
4000DS I	£142.80
4000DB	£196.71
GX 265D	£323.43
GX 630DB	£447.96
Teac	
A 2300SX	P.O.A.
A 2300SD	P.O.A.
A 3300SX2T	P.O.A.
A 3340S	P.O.A.
Sony	
TC 645	£254.00
TC 377	£158.00

TURNTABLES

Akai	
AP 001	£66.00
AP 003	£83.75
AP 006	£130.00
Garrard	
SP25 Mk IV	£36.72
DD75	£90.50
125 SB W/Cart.	£49.50
86 SB Mk II	£68.00
GT 55P	£100.00
Goldring	
L 80 PC	£56.92
L 84 PC	£77.40
L 90 PC	£120.00
Hitachi	
PS 38	£88.54
PS 48	£103.84

J.V.C.	
JLA 15	£62.00
JLF 45	£132.00
Leak	
3001	£90.00
Marantz	
6100	£65.00
6200	£128.59
6300	£162.12
Micro Seiki	
MB 10	£59.00
DD20	£111.00
Pioneer	
PL 112D	£60.00
PL 115D	£68.28
PL 117D	£101.00
PL 510A	£120.00
PL530	£163.00
Rotel	
RP 900	£59.60
RP 1500 W/A	£70.00
RP 3000 W/A	£115.00
Harman/Kardon	
ST-6	£261.00
ST-7	£325.00
Sansui	
SR 222P	£59.00
FR 1080P	£76.00
SR 525P	£124.00
FR 5080P	£173.00
SR 929P	£287.00
Sony	
PS 1450	£62.50
PS 1700	£78.00
PS 3300	£114.50
PS 4300	£139.70
PS 6750	£170.95
Technics	
SL 20	
SL 23	
SL 150	
SL 1600	
SL 1700	
SL 1800	
SL 2000	
SP 10/II	
Thorens	
TD 126 Mk IIC	£203.76
TD 126 Mk IIB/C	£162.19
TD 145 Mk IIC	£105.13
TD 160 Mk IIC	£88.83
TD 160 Mk IIB/C	£72.53
TD 166 Mk IIC	£77.42
Yamaha	
YP 211	£76.60
YP 511	£125.95

SPEAKERS

AR	
AR 7X	£78.95
AR 16	£129.95
AR 17	£109.00
AR 14	£177.00
AR 12	£225.00
AR 11	£290.00
AR 10 pic	£425.00
Celestion	
Ditton 11	£58.20
Ditton 22	£93.40
Ditton 15	£120.64
Ditton 33	£144.64
Ditton 44	£162.95
Ditton 25	£188.95
Ditton 66	£272.95
UL 6	P.O.A.
UL 8	P.O.A.
UL 10	P.O.A.
Cerwin Vega	
1ST	£654.95
211R	£418.85
Leak	
3020	£81.71
3030	£105.00
3050	£145.00
3080	£210.00
Technics	
SB 30	
SB 40	
SB 102	
SB 202	
SB 302	
SB 402	
SB 501	
SB 4500	
SB 5000	
SB 6000	
SB 7000	

National	
SB 60	P.O.A.
SB 61	P.O.A.
Wharfedale	
Chevin XP	£27.50
Denton 2XP	£40.50
Linton 3XP	£57.95
Glendales 3XP	£78.95
Dovedales 5P	£137.00
Airedales	£219.00
Marantz	
HD 44	£103.00
HD 55	£142.00
HD 66	£202.00
HD 77	£290.00
4G	£62.50
5G	£90.00
6G	£139.00
7G	£167.00
KLH	
KLH CL3	£275.00
KLH CB8	£167.00
KLH CB10	£247.00
KLH 300	£76.50
KLH 317	£142.00
KLH 331	£97.00
KLH 363	£220.00
JR	
JR 149	£128.00
Tannoy	
Eaton	£218.10
Devon	£243.00
Cheviot	£257.17
Berkeley	£326.02
Arden	£372.00

MUSIC CENTRES

Aiwa	
AF 3060	P.O.A.
AF 5050	P.O.A.
AF 5080 w/o spk.	P.O.A.
Speakers CS25	P.O.A.
J.V.C.	
MF 1820L wo/spk	£150.00
MF 1845L wo/spk	£238.00
MF 55 wo/spk	£320.00
National	
RE 7860LB	P.O.A.
SG 1020L	P.O.A.
SG 1060L	P.O.A.
SG 2070L	P.O.A.
SG 2500L	P.O.A.
SG 2080L	P.O.A.
SG 3060	P.O.A.
SG 3090	P.O.A.
Hitachi	
SDT 2690 sp/offer	£313.00
SDT 7620	P.O.A.
SDT 7660	P.O.A.
SDT 7675	P.O.A.
Pioneer	
M 6500 wo/spk	£262.00
Sanyo	
G 2711 Super	£215.95
G 2711 KL	£169.95
2422 KL	£143.95
DXT 5502 wo/spk	£217.35
G 2311 KL	£95.00
2615 H	£86.00
Sony	
HMK 40A	£247.50
HMK 70	£380.95
EX-2K	£200.95
EX-1K	£170.95
Rotel	
RM 5010	P.O.A.

HEADPHONES

Sennheiser	
HD 424	

Our new Tech/2. Better than you're ever likely to hear.



Your ears are the only limit to the range of clear, pure sound the new professional standard Tech/2 brings you.

Because the Tech/2 has an ultra-wide frequency response of 10-22,000 Hz, extending well beyond the range of normal human hearing, you enjoy the maximum possible spectrum of sound.

Since the total harmonic distortion is less than an infinitesimal 0.3% at 1kHz at 100dB-SPL the sound has superb clarity.

In fact the Tech/2's 50mm polyester dynamic driver elements produce a performance usually only surpassed by electrostatic transducers.

Like all Koss stereophones, it has a quality of styling to match its quality of reproduction – with a slim silhouette and a distinctive ebony-teak colour finish.

One well-established Koss feature of the Tech/2 is its Pneumalite ear cushions which seal against the head to give maximum isolation from ambient noise and extend the bass response with complete smoothness to below audibility.

Another is its comfort. You almost forget you're wearing it. Only the music reminds you.

You'll find its price comfortable too. No one gives you so much technology for your money as Koss.

Like all Koss products, the Tech/2 is the result of continuing technological innovation by the people who invented stereophones.

Send the coupon, and we'll send you the full Tech/2 story.

KOSS STEREOPHONES, Sole U.K. Distributors: Tape-Music **HFN7**
Distributors Ltd., 114 Ashley Road, St Albans, Herts. AL1 5JR.
Tel: St Albans 64337.

Please send me full details of the Tech 2.

Name

Address

KOSS stereophones

From the people who invented stereophones.

ALL THE BEST IN HI-FI & AUDIO AT THE UK'S KEENEST PRICES!

WICKS

- THE BEST PRICES
- FULL SERVICE AND BACK-UP
- DEMONSTRATIONS

- FULL RANGE OF EQUIPMENT IN STOCK ALL THE TIME
- ALL PRICES INCLUDE VAT

LUXURIOUS NEW SHOWROOMS

AGENTS FOR

- ACOUSTIC RESEARCH ■ ACCUPHASE ■ AKAI ■ AIWA
- ARMSTRONG ■ CAMBRIDGE ■ CELESTION ■ ERA
- GARRARD ■ GOLDRING ■ GOODMANS ■ HARMEN KARDEN ■ J.B.L. ■ B.I.C. ■ KEF ■ KOSS ■ LEAK
- MARANTZ ■ METRO SOUND ■ B.B.C. MONITOR
- NATIONAL PANASONIC ■ ORTOFON ■ PIONEER
- QUAD ■ ROGERS ■ RDTL ■ REVOX ■ SCAN DYNA
- SANSUI ■ SHURE ■ S.M.E. ■ SANYO ■ TEAC
- TECHNICS ■ THORENS ■ TRIO ■ WHARFEDALE
- YAMAHA ■ HITACHI ■ GRUNOIG



ORDERING BY POST

Tell us what you want. Send a cheque or postal order to cover the cost plus £3.50 delivery charge. Or let us have your Access or Barclaycard number. Either way, if the equipment is in stock, you'll have it in 72 hours - by Securicor!

ORDERING BY PHONE

To reserve equipment in stock, just give us a ring on Colchester (0206) 78807. We'll hold it for you for up to 48 hours, to give you time to call in or settle the deal by post. Or you can give us your Access or Barclaycard number over the phone - do it before 12 noon, and we'll guarantee same-day despatch!

GUARANTEE

Everything from Wicks is covered by the manufacturer's own guarantee - usually 1 or 3 years. During the guarantee period, we will service the equipment free of charge. If you return the goods via a carrier, you pay the forward carriage, we pay the return. From Wicks, there's a 99% chance of a 24-hour turnaround service.

STEREO RECEIVERS

Aiwa AX7500	P.O.A.
Armstrong 625	P.O.A.
Armstrong 626	P.O.A.
Akai 1010	£120.00
Akai 1020	£142.95
Akai 1030	£159.00
Akai 1050	£259.00
Pioneer SX450	Keenest prices on application
Pioneer SX550	
Pioneer SX650	
Pioneer SX750	
Pioneer SX850	
Pioneer SX950	
Pioneer SX1250	
Rotel RX152 Mk 2	£89.00
Rotel RX202 Mk 2	£102.00
Rotel RX402	£135.00
Rotel RX602	£172.00
Rotel RX802 (Sp. off.)	£199.95
Sony STR701S	£126.00
Sony STR702S	£136.00
Sony STR703S	£152.00
Sony STR4800	£195.00
Sony STR5800	£229.00
Sony STR6800	£290.00
Sansui 5050	£180.00
Sansui 6060	£220.00
Sansui 7070	£300.00
Sansui 8080	£359.00
Sansui 9090	£428.00
Trio KR2600	Keenest prices on application
Trio KR3600	
Trio KR4600	
Trio KR5600	
Trio KR6600	
Trio KR9600	
Technics (Full range)	P.O.A.
Yamaha (Full range)	P.O.A.
Harman Kardon (Full range)	P.O.A.

Sansui TU5900	£148.00
Sansui TU7900	£175.00
Trio KT5300	Keenest prices on application
Trio KT7300	
Yamaha (Full range)	P.O.A.
Technics (Full range)	P.O.A.

STEREO AMPLIFIERS

Armstrong 621	P.O.A.
Cambridge P110 (Sp. off.)	£126.00
Leak 3900A	£248.00
Pioneer SA5300	Keenest prices on application
Pioneer SA6300	
Pioneer SA7500	
Pioneer SA8500	
Quad for personal callers only	£56.00
Rotel RA212	£64.00
Rotel RA312	£82.00
Rotel RA412	£82.00
Rotel RA712	£99.95
Rotel RA812	£142.00
Rotel RA1312	£255.00
Rotel RA1412	£333.00
Sansui AU2900	£69.00
Sansui AU3900	£95.00
Sansui AU4900	£116.00
Sony TA70	£48.00
Sony TA88	£55.00
Sony TA1630	£79.95
Sony TA2650	£103.00
Sony TA3650	£142.00
Sony TA5650	£219.00
Technics (Full range)	P.O.A.
Yamaha (Full range)	P.O.A.
Harman Kardon (Full range)	P.O.A.

TURNTABLES

Pioneer PL112D	Keenest prices on application
Pioneer PL112D com.	
Shure M75ED-2 cart.	
Pioneer PL115D	
Pioneer PL115D com.	
Shure M75ED-2 cart.	
Pioneer PL117D	
Pioneer PLS10A	
Pioneer PLS30	
Pioneer PLS50	
Sansui SR222	£56.50
Sansui SR525	£119.00
Sony PS1450	£64.00
Sony PS1700	£76.00
Sony PS3300	£112.00
Sony PS4300	£136.00
Sony PS6750	£166.00
Technics (Full range)	P.O.A.

TUNERS

Armstrong 623	P.O.A.
Armstrong 624	P.O.A.
Pioneer TX7500	Keenest prices on application
Pioneer TX9500	
Rotel RT224	£59.95
Rotel RT324	£76.00
Rotel RT724	£89.95
Rotel RT824	£138.00
Rotel RT1024	£235.00
Sony ST70	£48.00
Sony ST88	£55.00
Sony ST2950	£96.00
Sony ST3950	£133.00
Sony ST5950	£209.00
Sansui TU3900	£104.50

Strathearn STM4/Shure M75ED-2	£75.00
Linn Sondek	P.O.A.
Yamaha (Full range)	P.O.A.
Trio KD205S	Keenest prices on application
Trio KD500	
Rotel RPI500 complete	£69.95

SPEAKERS

Celestion D.15	£92.00
Celestion D.33	£135.00
Celestion D.44	£160.00
Celestion D.25	£185.00
Celestion D.66	£268.00
Celestion UL6	P.O.A.
Celestion UL8	P.O.A.
Celestion UL10	P.O.A.
Bowers & Wilkins (Full range)	P.O.A.
Acoustic Research (Full range)	P.O.A.
Kef (Full range)	P.O.A.
Leak 3020	£82.00
Leak 3030	£112.00
Leak 3050	£145.00
Leak 3080	£229.00
Monitor Audio (Full range)	P.O.A.
Spendor (Full range)	P.O.A.
Tannoy (Full range)	P.O.A.
Wharfedale Denton 2XP	£41.95
Wharfedale Linton 3XP	£57.95
Wharfedale Glendale 3XP	£79.95
Wharfedale Dovedale SP	£129.95
Wharfedale Airedale SP	£129.95
Sony SS2030	£79.95
Sony SS3050	£149.00
Sony SS5050	£248.00
Technics	P.O.A.
Bose 301	P.O.A.
Bose 501	P.O.A.
Bose 901	P.O.A.

Sansui SC3000	£180.00
Sony TC1185D	£89.95
Sony TC1355D	£115.00
Sony TC1365D	£129.95
Sony TC1865D	£124.95
Sony TC2045D	£148.00
Sony TC2065D	£185.00
Sony TC2095D	£239.95
Sony TC1385D	£165.00
Sony TC153	£167.50
Sony TC177	£389.00
Sony TC144 cassette recorder	
including speakers	£145.00
Sony Elcasett EL5	£275.00
Sony EL7	£425.00
Amstrad 7050	£79.95
Amstrad 7070 (Sp. off.)	£89.95
Technics (Full range)	P.O.A.
Yamaha (Full range)	P.O.A.

TAPE DECKS

Akai 4000DS Mk 2	£136.00
Akai 4000DB	£184.00
Akai GXC265D	£299.95
Akai GXC630DB	£425.00
Sony TC377	£155.00
Sony TC645	£250.00

TV

Sony TV110UK	£89.95
Sony TV144UK	£95.00
Sony KV1340UB	£228.00
Sony KV1820UB	£275.00
Sony KV2000UB	£310.00

MUSIC CENTRES

Sony HMP40	£149.00
Sony HMK40A	£239.95
Sony HMP70	£230.00
Sony HMK70	£355.00
EXIK	£163.95
EX2K	£195.00
Aiwa AF5050 complete	£299.95
Aiwa AF5080 ex. speakers	£299.95
National Panasonic (Full range)	P.O.A.

Although all reasonable care is taken to ensure that details published in this advertisement are correct, no responsibility can be accepted for any errors or omissions. Prices are subject to change without prior notice and goods advertised are subject to availability.

'Such nice people'

WICKS



O.T. WICKS & CO., 49/51 NORTH STATION RD., COLCHESTER, ESSEX
 TELEPHONE: COLCHESTER (0206) 49842/3/4
 After hours: Colchester 42166 Telephone Orders: Colchester 78807

ORDER BY POST

Please supply (give make and model number)

I enclose £ _____ (cheque/PO)

or I wish to use my Access/Barclaycard.

The number is _____

*delete as applicable

SEND TO:

D. T. Wicks & Co.,
 49/51 North Station Road,
 Colchester, Essex. Telephone
 Colchester (0206) 49842/3/4

NAME _____

ADDRESS _____

HFN777

NEAL

4 CHANNEL RESOLVER



ADAPT YOUR
EXISTING STEREO
SYSTEM TO PRODUCE
4-CHANNEL
SOUND!

NEW
STYLING
SAME
PROVEN CIRCUIT
ONLY
£18.40

+ VAT

The addition of the resolver to your HiFi enables rear speakers to be driven from stereo and quad sources.

NORTH EAST AUDIO LTD. 5 CHARLOTTE SQ NEWCASTLE UPON TYNE NE1 4XE
TELEPHONE: (0632) 26660



Wilmslow Audio

THE firm for speakers!

SEND 10p STAMP FOR THE WORLDS BEST
CATALOGUE OF SPEAKERS, DRIVE UNITS, KITS
CROSSOVERS ETC. AND DISCOUNT
PRICE LIST.

ACT ● AUDAX ● BAKER ● BOWERS & WILKINS
CASTLE ● CELESTION ● CHARTWELL ● COLES
DALESFORD ● DECCA ● EMI ● EAGLE ● ELAC
FANE ● GAUSS ● GOODMANS ● HELME
I.M.F. ● ISOPHON ● JR ● JORDAN WATTS
KEF ● LEAK ● LOWTHER ● MCKENZIE
MONITOR AUDIO ● PEERLESS ● RADFORD
RAM ● RICHARD ALLAN ● SEAS ● TANNOY
VIDEOTONE ● WHARFEDALE

WILMSLOW AUDIO Dept. HFN

SWAN WORKS, BANK SQUARE, WILMSLOW,
CHESHIRE SK9 1HF

Discount Hi-Fi etc. at 5 Swan Street and 10 Swan Street

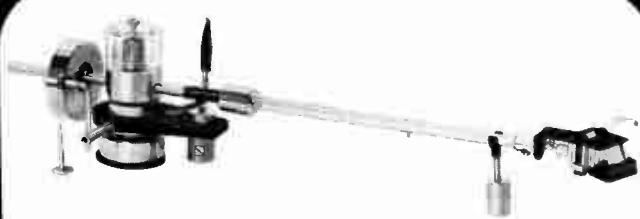
Tel: Wilmslow 29599 for Speakers
Wilmslow 26213 for Hi-Fi

Mayware

PLS4/D MkII FORMULA 4®

The best sounding universal tone arm
PROFESSIONAL LABORATORY

Silicone Damped Pick-up Arm

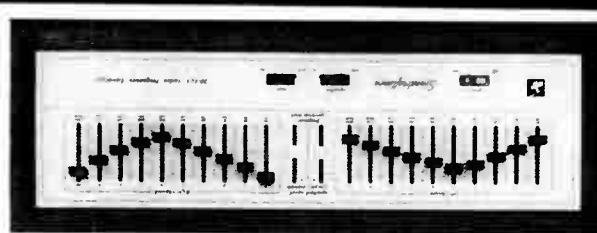


"Only Viscous Pivot Damping with variable low effective mass can ensure natural sound without 'listening fatigue' enabling all cartridges to reach their 'Linear Region' of best performance, absolutely essential for perfect Stereo and Quadraphonic transcription due to the suppression of instantaneous tracking force extremes which reduce record wear and high frequency playback distortion. Viscous pivot damping means better tracking especially of warped records, the sound having exceptionally good definition; rich, full and clean bass with dramatically improved solid stereo image and near pin-point localisation". *Leaflet on request.*

MAYWARE LTD. (Dept. HFN7)

15 Heather Walk, Edgware, Middlesex HA8 9TS, England.

Soundcraftsmen 20-12A Graphic Equalizer



REW are proud to present the Soundcraftsmen Graphic Equaliser—undoubtedly the finest unit of its kind for both Hi-Fi and professional use. Each of the stereo channels is divided into 10 frequency bands, from 20 Hz to 20,480 Hz. Boost and cut of 12 dB is provided on each band and a gain control adjusts the output to match any amplifier. The unit has a champagne gold anodised front panel, enclosed in an attractive wood-grained cabinet. The Soundcraftsmen can be used as a sophisticated tone control enabling you to highlight individual instruments. Alternatively it can be used to produce a near-perfect flat frequency response in any domestic conditions by compensating for either poor room acoustics or various deficiencies in Loudspeakers. Also perfect for equalizing tape recordings. Send for full literature.

Full range of Equalizers by other leading manufacturers also in stock including Altec, JVC, BSR, MXR, Technics.

Main West End Dealers: ● 146 Charing Cross Road, London WC2. Tel.: 01-240 3064/5.

● 230 Tottenham Court Road, London W1. Tel.: 01-637 2624/5.

● Mail orders to: REW House, (Dept HFN), 10-12 High Street, Colliers Wood, London SW19. Tel.: 01-540 9684/5/6.

REW

TRADE ENQUIRIES: D.E.S. Technical Co, 10-12 High St, Colliers Wood, London SW19. Tel.: 01-540 8944.

Quality Cassettes & Reels

CASSETTES	C30	C45/48	C60/66*	C90/96*	C120
AGFA New Super	—	—	£0.53	£0.72	£1.09
AGFA SFD* (SM)	—	—	£0.72	£0.96	£1.26
AGFA CrO2 (SM)	—	—	£0.98	£1.23	£1.69
AGFA Carat F/Chrom (SM)	—	£0.79	£1.17	£1.46	—
AMPEX 20/20+	—	—	£0.85	£1.33	—
AMPEX LH (SM)	—	—	£0.57	£0.75	£1.03
BASF LH (SM)	—	—	£0.83	£1.09	£1.45
BASF LHS (SM)	—	—	£1.10	£1.38	—
BASF CrO2 (SM)	—	—	£1.40	£1.80	—
BASF Ferrochrom (SM)	—	—	—	—	—
CERTRON High Density	£0.36	£0.38	£0.39	£0.49	£0.59
FUJI FX	—	—	£0.96	£1.35	—
MAXELL SLN	—	—	£0.62	£0.79	£1.04
MAXELL UD	—	—	£1.14	£1.29	£1.76
MAXELL UDXL 1	—	—	£1.36	£1.74	—
MAXELL UDXL 2	—	—	£1.49	£1.89	—
MEMOREX MrX2	£0.58	£0.65	£0.68	£0.89	£1.25
MEMOREX CrO2	—	—	£0.88	£1.33	—
TDK Dynamic	—	£0.48	£0.55	£0.75	£1.00
TDK Acoustic Dynamic	—	—	£0.74	£0.96	£1.40
TDK Super Avilyn	—	—	£1.02	£1.36	—
TDK Endless Cassettes: 3 minutes, £1.55; 6 minutes, £1.75.	—	—	—	—	—

REEL-TO-REEL

	Plastic D/P	Plastic L/P	Metal Cine L/P	Plastic D/P	Plastic Cine L/P	NAB L/P	NAB D/P
	5½" x 1800'	7" x 1800'	7" x 1800'	7" x 2400'	10½" x 3600'	10½" x 3600'	10½" x 4200'
AGFA PE36	—	£2.90	—	—	—	—	£8.70
AGFA PE46	£2.90	—	—	£3.60	—	—	—
AGFA PEM368	—	£3.50	£4.06	—	£7.85	£9.50	—
AMPEX H/F	—	£2.20	—	£2.95	—	—	—
AMPEX 20/20+	—	£3.50	—	—	—	£9.50	—
BASF LH	—	£3.90	—	£4.95	—	—	—
BASF LHS	—	£4.45	—	£5.99	—	—	—
MAXELL 35-90	—	£3.52	—	—	—	—	—
MAXELL 35-90B	—	£3.89	—	—	—	—	—
MEMOREX	—	£3.20	—	£4.32	—	£6.00	—
TDK Audua L	—	£2.64	—	—	—	£7.25	—
TDK Audua M/B	—	£3.10	—	—	—	—	—

Prices include VAT at 8% and are offered until 30 July 1977 subject to availability. POSTAGE & PACKING FOR U.K.—For Cassettes, 65p per order.

For Reels, 15p per reel. Minimum p & p 90p

Callers welcome, only 3 miles from the National Exhibition Centre on the A45. Parking at rear of office. Hours: Mon-Fri, 9 am to 6 pm; Sat, 9 am to 12.30 pm.

B.A.T.S.

All Mail to Dept. D6,
2259/61, Coventry Road, Sheldon, Birmingham.
West Midlands B26 3PA Tel. 021.742.6311

HI-FI IN SCOTLAND

★ Up to **THREE**
years guarantee
on most makes.



FONS TURNTABLE £79.50

SME 3009 Series II. Improved non-detachable shell, £39.90
SHURE V15 III Cartridge, £51.80

Tandberg, National Panasonic, Sony, J.V.C.,
Yamaha, Pioneer, Fons, Technics, Bang and
Olufsen, Akai, Marantz, Nakamichi, Armstrong,
Leak, Quad, Rotel, Acoustic Research, Kef,
Wharfedale, J. R. Speakers, Bose, Shure, etc.

- ★ Prices on application
- ★ Credit terms to callers
- ★ Comparative Demonstrations

Vennal A. V.

115 High St, Central Arcade, Ayr KA71QL.

Telephone: 0292-64124

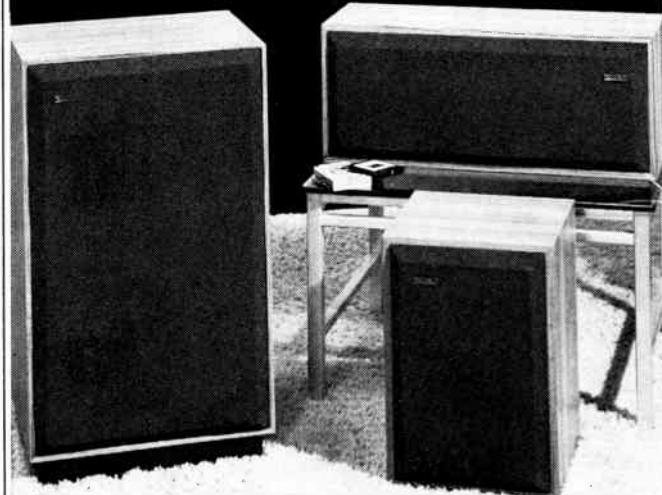
also at

49 The Foregate, Kilmarnock

Telephone 34826

3 of the best

Tango Maramba Charisma



Richard Allan bring you three high efficiency systems designed to the most exacting standards, obtaining the best possible reproduction at minimum cost.

Each unit is beautifully finished in natural teak or walnut veneer, and enhanced with a sculptured front of acoustically transparent foam, ensuring that there is no significant effect on the treble response.

Both the Tango and Maramba are compatible with the Charisma, as rear speakers in quadrophonic systems.

Richard Allan

Please send me further information on the above systems, plus a list of Richard Allan stockists in my area.

Richard Allan Radio Ltd., Bradford Road,
Gomersal Cleckheaton BD19 4AZ, Yorkshire, England.
Tel: Cleckheaton (0274) 872442

Cables: 'Acoustics' Bradford Telex: 51112 Concab—G

Name

Address

HFN8

HI FI

BEST BUY BERKS HI-FI

STUDIO SHOWROOM

Visit our King St. Maidenhead
Showroom specialising in:-

TECHNICS

Full range of this technically brilliant range normally in stock and on demonstration at King Street. So come and haggle!

Amplifiers

SU7200, SU7600, SU3500, SU/SE9600

Tuners

ST7600, ST3500

Receivers

SA5060, SA5160, SA5260, SA5360

Cassette Decks

RS263, RS273, RS630, RS676, RS615, RS640

Turntables

SL20, SL23, SL2000, SL1700, SL1800

Speakers

SB102, SB202, SB302, SB402, SB501, SB5000, SB4500.

Technics also available at Reading and Aldershot.

BANG & OLUFSEN

Designed by Connoisseurs with connoisseurs in mind. Beogram 1100, 3400, 4002, 6000

Beomaster 901, 1100, 1900, 3400, 4400, 6000, 2200

Beocentre 1500, 1600, 1800, 3500.

Beocord (Cassette) 1100. Beovox S22, S30, S45, S60, M70, P30, P45

Prices! Come and haggle!

ACOUSTIC RESEARCH

NEW RANGE—BRILLIANT in stock and on demonstration. AR7x, AR16, AR14, AR12, AR11, AR10, also at Aldershot.

KEESONIC

This super new range of speakers in stock and on demonstration the KBS, KRF and KBM. Available now.

ROTEL

RA212	..	..	£57.00
RA312 amp.	..	..	£67.00
RA412 amp.	..	..	£86.00
RA712 amp.	..	..	£99.00
RA812 amp.	..	..	£149.00
RA1312 amp.	..	..	£268.00
RA1412 amp.	..	..	£350.00
RT224	..	..	£62.00
RT324 tuner	..	..	£79.00
RT724 tuner	..	..	£94.00
RT824 tuner	..	..	£147.00
RT1024 tuner	..	..	£257.00
RX152 receiver	..	..	£94.00
RX202 receiver	..	..	£99.00
RX402 receiver	..	..	£143.00
RX602 receiver	..	..	£188.00
RX802 receiver	..	..	£237.00
RX7707 receiver	..	..	£163.00
RX11603 receiver	..	..	£515.00
RD20 cass. deck	..	..	£145.00
RD12F cass. deck	..	..	£156.00
RP900 t/table	..	..	£59.00
RP1500 t/table	..	..	£66.00
RP3000 t/table	..	..	£115.00
RM5010 music centre	..	..	£299.00

AKAI

AM2200 amp.	..	..	£79.00
AM2400 amp.	..	..	£119.00
AT2200 tuner	..	..	£80.00
AT2400 tuner	..	..	£124.00
AA1010 receiver	..	..	£123.00
AA1020 receiver	..	..	£152.00
AA1030 receiver	..	..	£169.00
AA1050 receiver	..	..	£273.00
GX34D cass. deck	..	..	£99.00
GX39D cass. deck	..	..	£138.00
GX310D cass. deck	..	..	£139.00
GX705D cass. deck	..	..	£134.00
GX707D cass. deck	..	..	£167.00
GX710D cass. deck	..	..	£215.00
GX740D cass. deck	..	..	£310.00
GX760D cass. deck	..	..	£390.00
4000DS reel-to-reel	..	..	£144.00
4000DB reel-to-reel	..	..	£198.00
GX265D reel-to-reel	..	..	£327.00
AP003 t/table	..	..	£95.00
AP006 t/table	..	..	£172.00

AIWA

TPR910 Rec./Cass.	C.A.H.
TPR940 Rec./Cass.	C.A.H.
AD1250 Cassette	C.A.H.
AD1600 Cassette	C.A.H.
AD1800 Cassette	C.A.H.
AD6300 Cassette	C.A.H.
AD6500 Cassette	C.A.H.
AT7500 Tun./Amp.	C.A.H.
AF3060 Tun./Amp/C	C.A.H.
AF5080 Music Centre	C.A.H.
AF5050 Music Centre	C.A.H.

NATIONAL

SG1060L Music Centre	..	..	C.A.H.
SG3060L Music Centre	..	..	C.A.H.
SG2070L Music Centre	..	..	C.A.H.
SG2080L Music Centre (Dolby)	..	..	C.A.H.
SG3090L Music Centre (Dolby)	..	..	C.A.H.
TC361GM CTV 13"	..	..	C.A.H.
TC48G CTV 14"	..	..	C.A.H.
TC86G CTV 18"	..	..	C.A.H.
TC261G CTV 20"	..	..	C.A.H.

SONY

TA70 amp.	..	..	£50.00
TA1630 amp.	..	..	£81.00
TA2650 amp.	..	..	£108.00
TA3650 amp.	..	..	£150.00
TA5650 amp.	..	..	£231.00
ST70 tuner	..	..	£50.00
ST2950 tuner	..	..	£98.00
ST3950 tuner	..	..	£143.00
STR7015 receiver	..	..	£125.00
STR7025 receiver	..	..	£146.00
STR7035 receiver	..	..	£166.00
STR4800 receiver	..	..	£206.00
STR5800 receiver	..	..	£258.00
STR6800 receiver	..	..	£306.00
PS1700 t/table	..	..	£78.00
PS3300 t/table	..	..	£115.00
PS4300 t/table	..	..	£143.00
TC118 cass. deck	..	..	£98.00
TC135 cass. deck	..	..	£123.00
TC136 cass. deck	..	..	£139.00
TC138 cass. deck	..	..	£176.00
TC153 cass. deck	..	..	£182.00
TC177 cass. deck	..	..	£403.00
TC186 cass. deck	..	..	£133.00
TC204 cass. deck	..	..	£159.00
TC206 cass. deck	..	..	£177.00
TC209 cass. deck	..	..	£254.00
TC377 reel-to-reel	..	..	£163.00
HMK70 music centre	..	..	£339.00

HITACHI

SDT2690 Music Centre	..	..	C.A.H.
SR302	..	..	£119.00
SR502	..	..	£135.00
SR802	..	..	£190.00
SR6100	..	..	£126.00
FT920	..	..	£125.00

REVOX

1102, 1104—From stock
Other models on application

PIONEER

SA5300 amp.	..	..	£65.00
SA6300 amp.	..	..	£80.00
SA7300 amp.	..	..	£124.00
SA7500 amp.	..	..	£181.00
SA8500 amp.	..	..	£206.00
SA9500 amp.	..	..	£278.00
TX5300 tuner	..	..	£73.00
TX7500 tuner	..	..	£145.00

THIS MONTHS SUPER SAVERS

TX9500 tuner	..	..	£199.00
SX450 receiver	..	..	£115.00
SX550 receiver	..	..	£141.00
SX650 receiver	..	..	£206.00
SX750 receiver	..	..	£246.00
SX850 receiver	..	..	£328.00
SX950 receiver	..	..	£376.00
SX1250 receiver	..	..	£578.00
PL112D t/table	..	..	£55.00
PL115D t/table	..	..	£68.00
PL117D t/table	..	..	£102.00
PL510D t/table	..	..	£105.00
PL530D t/table	..	..	£164.00
PL550D t/table	..	..	£194.00
CTF2121 cass. deck	..	..	£134.00
CTF6060 cass. deck	..	..	£172.00
CTF7070 cass. deck	..	..	£186.00
CTF8080 cass. deck	..	..	£241.00
CTF9191 cass. deck	..	..	£285.00
M6500 music centre	..	..	£275.00
Speakers	..	..	P.O.A.

J.V.C.

JLA15 Turntable	..	..	C.A.H.
JLA45 Turntable	..	..	C.A.H.
JRS100 Tun./Amp.	..	..	C.A.H.
JRS200 Tun./Amp.	..	..	C.A.H.
JAS11 Amplifier	..	..	C.A.H.
JAS31 Amplifier	..	..	C.A.H.
JTV31 Tuner	..	..	C.A.H.
CDS200 Cassette	..	..	C.A.H.
CD1740 Cassette	..	..	C.A.H.
KD21 Cassette (Dolby)	..	..	C.A.H.

Other models on application

TRIO

KA7300	..	..	£250.00
KA9100	..	..	£345.00
KA1500	..	..	£69.95
KA3500	..	..	£109.50
KA7100	..	..	£195.00
KT5300	..	..	£89.95
KT7300	..	..	£199.95
KT8300	..	..	£285.00

Other models on application

SPEAKERS

A.R.—From stock			
B & W—Maidenhead			
B & O—Maidenhead			
Cerwin Vega	..	..	C.A.H.
Celestion Ditton 11	..	..	£60.00
Celestion Ditton 15	..	..	£97.00
Celestion Ditton 44	..	..	£178.00
Celestion Ditton 33	..	..	£150.00
Celestion Ditton 25	..	..	£206.00
Celestion Ditton 66	..	..	£297.00
UL6, UL8, UL10	..	..	C.A.H.
KEF Coda	..	..	C.A.H.
KEF Cantor	..	..	C.A.H.
KEF Chorale	..	..	C.A.H.

Rotel 152/II Receiver	..	..	£79.00
Rotel 202/II Receiver	..	..	£89.00
Rotel 402 Receiver	..	..	£119.00
Rotel 602 Receiver	..	..	£145.00
Rotel 7707 Receiver	..	..	£139.00
Rotel 312 Amplifier	..	..	£59.00
Rotel 412 Amplifier	..	..	£75.00
Rotel 712 Amplifier	..	..	£89.00
Rotel 324 Tuner	..	..	£69.00
Rotel 724 Tuner	..	..	£85.00
Rotel 900 Turntable	..	..	£49.00
Rotel 1500 Turntable	..	..	£59.00
Rotel 2500 Turntable	..	..	£79.00
Rotel R20 Cass/Deck	..	..	£129.00
Rotel 5010 Music Centre	..	..	£289.00
Sony 7015 Receiver	..	..	£115.00
Sony 186 Cass/Deck	..	..	£125.00
Sony 209 Cass/Deck	..	..	£199.00
Sony HMK70 Music Centre	..	..	£339.00
Pioneer SA5300 Amp	..	..	£59.00
Pioneer SA6300 Amp	..	..	£69.00
Pioneer TX5300 Tun.	..	..	£69.00
Pioneer SA8500 Amplifier	..	..	£179.00
Akai 1010 Receiver	..	..	£95.00
Akai 710 Cass/Deck	..	..	£155.00
Akai 740 Cass/Deck	..	..	£225.00
Akai 34D Cass/Deck	..	..	£85.00
Akai 265 R/Reel	..	..	£245.00
Tannoy Cheviot Loudspeakers	..	..	£269.00
Tannoy Devon Loudspeakers	..	..	£289.00
Marantz 2215 Receiver	..	..	£99.00

N.B.—All above are Cash/Cheque only.

KEF Correlli	..	..	C.A.H.
KEF Cantata	..	..	C.A.H.
KEF Calinda	..	..	C.A.H.
Leak 3020	..	..	£82.00
Leak 3030	..	..	£108.00
Leak 3050	..	..	£150.00
Leak 3080	..	..	£230.00
Marantz	..	..	C.A.H.
Sony	..	..	C.A.H.
Technics	..	..	C.A.H.
Videotone Minimax	..	..	C.A.H.
Videotone Saphir	..	..	C.A.H.
Wharfedale Chevin	..	..	£28.00
Wharfedale Denton	..	..	£40.00
Wharfedale Linton	..	..	£58.00
Wharfedale Glendale	..	..	£85.00
Wharfedale Dovedale	..	..	£146.00

NOTE!! ALSO STOCKED, SANYO, TOSHIBA, LEAK, MARANTZ, TDK, KOSS. CAH = Come and Haggle.

MAIL ORDER TO READING P & P £2.50. ACCESS BARCLAY CARD. Prices Correct 30/4/77 E & O E.

125 Bridge Road

8 Meadway Precinct

179 Victoria Road

49-51 King Street

MAIDENHEAD

READING

ALDERSHOT

MAIDENHEAD

tel.: (0628) 27760

tel.: (0734) 582988

tel.: (0252) 312151

tel.: (0628) 32796

STEREO AMPLIFIERS

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
AKAI		
AM 2200	121.01	84.90
AM 2400	182.00	129.90
AM 2600	234.45	166.90
AM 2800	299.95	219.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
ALBA		
U/A 700A	—	48.90
U/A 900	—	76.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
AMSTRAD		
8000 Mk. 3	—	29.90
IC 2000 Mk. 3	—	41.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
FERROGRAPH		
F208 Mk. 2	—	72.94
F608 Mk. 2	—	124.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
GOODMANS		
Model 40-40	—	64.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
LEAK		
3900A	371.78	249.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
MARANTZ		
1030	96.47	79.90
1040	174.38	144.90
1060	150.90	124.90
1070	218.24	179.90
1150	398.09	334.90
1150D	495.70	419.90
3800 pre-amp	778.64	649.90
510 M pow. amp	1,065.97	889.90
3200 pre-amp	193.03	162.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
PIONEER		
SA 5300	85.86	57.94
SA 5500 Mk. II	92.79	67.90
SA 7300	162.62	109.94
SA 7500	238.14	159.94
SA 8500	271.22	179.94
SA 9500	363.80	229.94
SA 9900	539.80	399.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
ROTEL		
RA 212	82.35	49.94
RA 312	97.10	67.90
RA 412	125.30	88.90
RA 712	152.00	99.90
RA 812	217.55	149.90
RA 913	234.47	169.90
RA 1312	390.00	249.90
RA 1412	510.00	339.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
SANSUI		
AU 2900	100.01	64.90
AU 3900	143.06	94.90
AU 4900	173.38	114.90
AU 5900	246.53	166.90
AU 7900	337.71	229.90
AU 9900	559.29	379.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
SOLAVOX		
20.10 watts RMS per channel	45.53	24.94
30.15 watts RMS per channel	53.46	29.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
TRIO		
KA 1500	79.95	69.95
KA 3500	125.00	109.50
KA 5500	218.50	190.00
KA 7300	287.50	250.00
Mod 600	635.00	550.00

TUNERS

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
AKAI		
AT 2200	116.00	79.90
AT 2400	181.00	123.90
AT 2600	215.15	154.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
ALBA		
UA 800A	—	49.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
AMSTRAD		
3000 Mk. 2	—	41.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
FERROGRAPH		
SFM 1 Mk. 2	—	89.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
LEAK		
3900T	306.30	219.90

Check our prices by phone. They may be even cheaper!

All the prices in this advertisement were prepared approximately 6 weeks ago to meet the necessary publication date. This means that owing to our policy of giving the best possible value for money, some of our prices may be even lower! So please phone your nearest Comet warehouse or shop to check the latest price.

You may find that Comet are giving you an even better bargain than before!

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
--	----------------------------	----------------------

Tuners — continued

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
MARANTZ		
104	110.06	99.90
112	209.79	174.90
150	502.27	414.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
PIONEER		
TX 5500 Mk. II	105.54	77.90
TX 7500	189.42	124.94
TX 9500	261.87	169.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
ROTEL		
RT 224	90.30	57.90
RT 324	114.85	79.90
RT 724	136.70	89.90
RT 824	214.65	139.90
RT 1024	373.75	264.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
SANSUI		
TU 3900	151.89	99.90
TU 5900	223.84	139.90
TU 7900	262.67	179.90
TU 9900	411.15	279.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
TRIO		
KT 5300	105.00	89.95
KT 7300	230.00	199.95
Mod 600T	575.00	495.00

TUNER/AMPLIFIERS

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
AKAI		
AA 1010	178.50	109.90
AA 1020	219.50	134.90
AA 1030	245.00	164.90
AA 1050	393.75	199.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
ALBA		
1500	—	74.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
AMSTRAD		
5050	—	89.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
FERGUSON		
3477 FM stereo preset tuning 2 x 17 watts output	—	49.90
3491 stereo FM 2/4 channel tuner amplifier with SQ decoder, 4 x 14 watts output	—	69.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
GOODMANS		
Module 90	—	129.94
Module 120	—	139.94
Module 150	—	219.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
LEAK		
3200	225.65	154.90
3400	282.74	194.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
MARANTZ		
4400	986.97	819.90
2325	750.11	619.90
2275	650.09	539.90
2250	523.64	434.90
2235	401.69	229.90
2225	252.78	209.90
2215B	150.90	114.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
SUPERSCOPE		
R1240 by Marantz	205.27	89.94
R1270 by Marantz	240.00	109.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
PHILIPS		
RB 740 with two speakers	—	49.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
--	----------------------------	----------------------

Tuner/Amplifiers — continued

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
PHILIPS		
RH743 AM/FM/MPX tuner pre-amplifier for use with RH541 or RH544 MFB speakers	—	99.94
RH752	—	169.94
RH851 AM/FM/MPX tuner amp, stereo cassette deck, DNL with two speakers	—	149.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
PIONEER		
SX 300	104.90	69.94
SX 450	161.40	114.90
SX 550	199.37	144.90
SX 650	271.26	204.90
SX 750	322.80	239.90
SX 850	430.45	319.90
SX 950	494.20	369.90
SX 1250 160 watts RMS per channel	757.80	529.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
ROTEL		
RX 102 Mk. 2	120.45	74.94
RX 152 Mk. 2	137.00	89.94
RX 202 Mk. 2	156.75	102.90
RX 402	207.90	124.90
RX 602	273.90	149.94
RX 603	300.65	217.90
RX 802	344.45	189.94
RX 803	376.25	269.90
RX 1603	750.00	529.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
SANSUI		
221	141.62	74.90
331	155.76	99.90
551	209.21	109.94
661	268.14	149.94
5050	268.14	179.90
6060	322.05	214.90
7070	436.26	289.90
8080	502.48	329.90
9090	633.35	399.90
QRX 777 QS CD4	737.29	499.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
SANYO		
DCX 1850	—	64.94
DCX 2000	—	79.94
DCX 4000	—	99.94
DCX 6000	—	119.94
DCX 8000	—	129.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
TRIO		
KR 2600	149.95	109.50
KR 3600	197.50	172.00
KR 4600	247.50	215.00
KR 5600	287.50	250.00
KR 6600	380.00	330.00
KR 9600	660.00	575.00

TURNTABLES

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
AKAI		
AP001	96.00	59.94
AP006 direct drive	249.50	109.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
AMSTRAD		
TP12D	—	39.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
CONNOISSEUR		
BD1 kit	19.41	14.90
BD2	57.38	34.90
BD3	100.41	64.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
--	----------------------------	----------------------

Turntables — continued

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
GARRARD		
SP25 Mk. 4 chass.	30.38	19.90
DD75 direct drive	131.06	79.90
401 chass.	106.88	64.90

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
GOLDRING		
G103 PC belt drive	54.00	29.94
L80PC	78.75	39.94
L82PC auto stop	90.00	49.94
L84PC auto return	106.88	54.94
L90PC electronic auto stop	166.50	84.94

	Rec. Retail Price Inc. VAT	Comet Price Inc. VAT
LEAK		

I promise you 12 months service, including parts and labour on all goods - without charge. After the initial free 12 month period you can still rely on us to keep your purchases in working order.

Michael Hollingbar
CHAIRMAN

Rec. Retail Comet
Inc. VAT Inc. Price Price
Inc. VAT Inc. VAT

Turntables — continued

McDONALD		
BDS90 TPD belt drive with ADC K5E	62.21	33.94
BDS95 TPD belt drive with ADC cartridge	54.83	37.90
PHILIPS		
GA312 belt drive with GP401	—	77.90
SANYO		
TP700 SA belt drive auto arm return	Sp. Price	54.94
TRIO		
KD 1033 belt drive inc. mag. cartridge	78.50	54.50

SPEAKERS

ALL SPEAKERS ARE PRICED AS PAIRS

AKAI		
SA800	135.50	74.94
AMSTRAD		
Acousta 2500	—	39.90
CELESTION		
Hadleigh	60.28	34.90
Ditton 11	92.82	54.90
Ditton 15	148.76	89.90
Ditton 22	185.62	119.90
Ditton 25	329.02	197.90
Ditton 33	240.84	142.90
Ditton 44	284.62	167.90
Ditton 66	494.50	279.90
FERROGRAPH		
S1	—	169.94
GOODMANS		
Protronic	—	34.94
Achromat 100 Monitor	—	74.90
Achromat 250 Monitor	—	109.90
Achromat 400 Monitor	—	154.90
Stand for 400 (pair)	—	14.90
RB18	—	49.90
RB20	—	66.90
RB35	—	94.90
LEAK		
2075	540.76	379.94
3020	128.56	79.90
3030	175.84	104.90
3050	245.80	159.90
3080	363.03	219.90
MARANTZ		
4G	84.47	62.90
5G	124.67	94.90
HD44	159.03	129.90
HD55	219.31	179.90
HD66	311.45	259.90
HD77	447.44	369.90
HD88	644.22	539.90
PHILIPS		
RH541 Motional feedback (MFB) built in 30 watts RMS amps	—	169.50
RH544 (MFB) 60 watts	—	239.90
PIONEER		
CS313A	78.37	58.90
HPM40	186.12	139.90
HPM160E	252.86	194.90
HPM100	387.54	289.90
ROTEL		
RL 150X	70.70	49.90
SANSUI		
ES200	221.36	129.94
SOLAVOX		
TK20	50.29	29.94
TK30	64.71	39.94
TK45	120.06	74.94
Speaker stands (pair)	16.99	12.50
TRIO		
LS202A	89.50	64.90
WHARFEDALE		
Chevin	42.55	28.90
Denton 2XP	63.34	44.90
Linton 3XP	91.71	63.90
Glendale 3XP	126.68	88.90
Dovedale SP	217.44	154.90
Airedale SP	368.46	199.94
E50	264.88	239.90
E70	324.99	294.90

CARTRIDGES

All cartridges marked * are suitable for CD4 and normal stereo records.

AMSTRAD		
M95	—	4.50
AUDIO		
Technica AT11EP	—	6.75
Technica AT13EA	—	11.90
*Technica AT12SP	—	13.50
*Technica AT14Sa	—	24.75
*Technica AT15Sa	—	35.90
*Technica AT20SLa	—	39.90
ADC		
*Super XLM	54.70	37.90
XLM	38.68	26.90
VLM	31.40	21.50
Q36	18.45	12.50
Q32	14.27	9.50
Q30	10.45	7.25
GOLDRING		
G900 Super E	47.25	29.94
ORTOFON		
VMS 20E	—	23.90
PHILIPS		
GP400	24.14	7.54
GP401	32.06	10.24
GP412	51.38	23.94
GP422	69.19	36.94
SHURE		
M55E	12.49	8.25
M75EJ	19.58	12.90
M75ED	23.29	14.90
M95EJ	20.25	12.90
M95ED	29.36	18.90
*M24H	37.80	21.90
V15-Mk. 3	60.41	44.90
SONOTONE		
9TAHC Diam/Saph.	3.65	1.75
STANTON		
500A	18.68	15.90
500EE	26.16	21.90
680EE	38.64	32.90
681EEE	59.96	49.90

HEADPHONES

AKAI		
ASE 7	15.00	9.90
ASE 11	18.45	9.94
ASE 22	27.35	17.90
AKG		
K140	23.63	13.90
K240	45.00	27.90
GOODMANS		
OHP10	—	18.50
KOSS		
Technician 2	—	29.94
Easy Listener	—	21.94
HV2	—	17.90
PRO-4AA	—	33.90
PRO5LC	—	24.94
K6	—	13.90
K6/LC (with volume control)	—	15.90
K125	—	14.90
K135	—	18.90
K145	—	22.90
Phase 2	—	39.94
MARANTZ		
SD5	23.18	15.90
PIONEER		
SE205	12.69	9.90
SE305	19.82	15.90
ROTEL		
RH 930 Electret Condenser	41.85	21.94
SANSUI		
SH5	27.75	18.90
SOLAVOX		
300/340	7.91	5.50
WHARFEDALE		
Isodynamic	28.00	13.94

PICK-UP ARMS AND HEADS

AUDIO		
Technica AT 1009	—	29.94
CONNOISSEUR		
SAU2	18.90	14.50
LUSTRE		
Pickup arm	—	19.94
SME		
3009 Ser 11 fixed head shell	56.70	38.90
S2 head shell	4.79	3.45
FD 200 Damper	22.28	15.90

HI-FI CASSETTE TAPE RECORDERS

AKAI		
CS34D Dolby	120.99	84.90
CS702D Dolby front load	138.00	97.90
CS705D Dolby front load	194.40	119.90
CS707D Dolby front load	242.00	154.90
GXC39D Dolby	201.20	119.90
GXC310D Dolby two capstans	241.50	139.90
GXC325D Dolby two capstans, three heads	355.50	199.94
GXC570D Dolby front load	595.50	424.90
GXC710D Dolby front load	311.45	217.90
GXC740D Dolby front load	448.80	319.90
GXC760D Dolby front load	564.05	399.90
AMSTRAD		
7050 Dolby	—	79.90
7070 Dolby front load	—	84.90
BUSH		
BT8503 Stereo	77.51	36.94
FERGUSON		
3279	64.95	44.94
3280 Dolby	89.95	64.94
GARRARD		
GC300 Dolby	157.44	99.94
GC350 Dolby front load	193.44	114.94
GOODMANS		
SCD110 Dolby front load	—	124.90
H.L./		
Phoenix CTR1	79.95	32.94
MARANTZ		
5020 Dolby front load	205.27	169.90
5120 Dolby	217.35	179.90
5220 Dolby front load	229.42	189.90
5420 Dolby	293.90	244.90
PHILIPS		
N2511 Dolby DNL	—	104.90
N2415 recorder inc. two loudspeakers battery/mains	—	77.90
PIONEER		
CTF 2121 Dolby front load	181.59	119.90
CT 4141A Dolby	135.82	94.90
CT 5151 Dolby	154.22	109.90
CTF 6060 Dolby front load	242.56	169.90
CTF 7070 Dolby front load	263.10	189.90
CTF 8080 Dolby front load	317.03	239.90
CTF 9191 Dolby front load	374.13	289.90
ROTEL		
RD10F Dolby front load	138.97	99.90
RD20 Dolby	226.90	129.94
SANSUI		
SC2000 Dolby front load	206.55	124.94
SC2002 Dolby front load	232.86	109.90
SC3000/3003 Dolby front load	261.13	174.90

Hi-Fi Cassette Tape Rec. — cont.

SANYO		
RD4260 Dolby	—	79.94
RD4080 Dolby	—	89.94
RD4600 Dolby auto rewind and repeat	—	159.94
TRIO		
KX 520 Dolby front load	149.50	129.50
KX 620 Dolby front load	199.95	155.00
KX 720 Dolby	220.00	185.00
KX 920 Dolby	250.00	220.00

HI-FI TAPE RECORDERS

AKAI		
4000 DS Mk. 2 stereo	208.50	139.90
4000 DB Dolby stereo	287.50	179.90
GX215D	369.65	269.90
GX265D stereo reverse	472.65	299.90
GX650D	850.15	619.90
FERROGRAPH		
7602 High Sp	—	535.00
7602 Dolby High Sp	—	639.00
7604 Dolby High Sp	—	639.00
7622 Dolby High Sp	—	699.00
7624 Dolby High Sp	—	699.00
PHILIPS		
N4504 4 track DNL	—	179.90
N4506 4 track DNL	—	259.90

MICROPHONES

AKAI		
ADM20	12.00	7.90
AKG		
D4	6.19	3.94
D5	9.45	5.94
D190E H	41.54	29.94
SHURE		
515 SA high impedance	24.30	17.94
515 SB low impedance	24.30	17.94

HI-FI FURNITURE

Schreiber self assembly Hi-Fi housing units in wood finish and white.

Wood Finish		
14 222	66.10	47.90
14 217	57.20	42.90
14 219	34.60	25.90
14 220	37.75	27.50
White Finish		
15 222	62.95	45.90
15 217	54.85	40.90
15 219	33.05	24.90
15 220	36.20	26.90

Send for illustrated leaflet.

BLANK TAPES

SCOTCH		
DYNARANGE CASSETTES		
C60	1.20	0.59
C90	1.68	0.69
C120	2.35	0.99
SCOTCH HIGH ENERGY		
C60	1.66	0.85
C90	2.01	1.15
SCOTCH		
High Energy C90 five pack with free head cleaner	10.15	5.75

Also available TDK and Memorex Recording Tapes at Discount Prices.

PLEASE NOTE
There are no longer Recommended Retail Prices on some brands of Hi-Fi equipment, consequently some recommended Prices shown are prices recommended prior to the end of September 1976. These are left for your information to assist you in evaluating your purchase.

SYSTEMS COSTING UP TO £150

SOLAVOX 20 amplifier 10 watts RMS per channel plus McDonald MP60 turntable de luxe base and cover, fitted with ADC K8 magnetic cartridge plus two Solavox TK20 loudspeakers.

148.54 85.78

AMSTRAD 8000 Mk. 3 amplifier 10 watts RMS per channel plus McDonald MP60 turntable de luxe base and cover, fitted with ADC K8 magnetic cartridge plus two Solavox TK20 loudspeakers.

90.74

SOLAVOX 30 amplifier 15 watts per channel plus McDonald MP60 turntable de luxe base and cover, fitted with ADC K8 magnetic cartridge plus two Solavox TK30 loudspeakers.

170.89 100.78

AMSTRAD IC2000 Mk. 3 amplifier 2 x 25 watts RMS plus McDonald BDS95 turntable de luxe plinth cover and ADC magnetic cartridge plus two Amstrad TK2500 loudspeakers.

119.70

SANSUI 221 AM/FM Stereo tuner amplifier 2 x 10 watts plus McDonald BDS 95 TPD belt drive turntable with ADC magnetic cartridge and base and cover plus two Solavox TK20 loudspeakers.

246.74 142.74

ALBA 1500 tuner amplifier 2 x 10 watts with McDonald BDS95 belt drive turntable de luxe base and cover fitted with ADC magnetic cartridge plus two Celestion Hadleigh loudspeakers.

147.70

SYSTEMS COSTING UP TO £200

AMSTRAD 5050 tuner amplifier AM/FM/MPX 2 x 25 watts RMS with McDonald BDS95 belt drive turntable with plinth, hinged lid and ADC magnetic cartridge plus two Amstrad 2500 loudspeakers.

167.70

SANSUI AU2900 amplifier 2 x 17 watts plus McDonald BDS95 belt drive turntable with base, cover, fitted ADC magnetic cartridge plus two Goodmans RB20 loudspeakers.

169.70

TRIO KA1500 amplifier 2 x 25 watts RMS with Trio KD1003 belt drive turntable complete with plinth, cover and Trio magnetic cartridge plus two Wharfedale Linton 3XP loudspeakers.

250.16 188.35

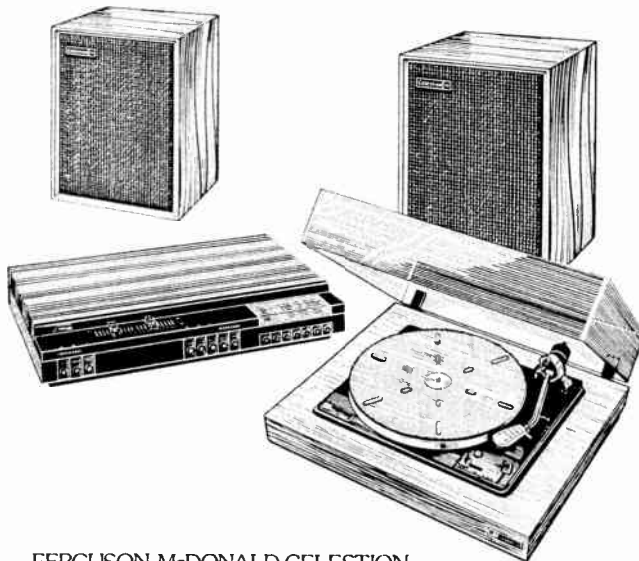
SYSTEMS COSTING UP TO £250

ROTEL RA312 amplifier 2 x 18 watts RMS plus Sansui SR222P turntable inc. base, cover plus Shure M75ED cartridge plus two Wharfedale Linton 3XP loudspeakers.

295.35 200.60

SANSUI 331 tuner amplifier AM/FM/MPX 2 x 15 watts RMS with a McDonald BDS95 TPD belt drive turntable, base and cover fitted with ADC magnetic cartridge plus two Wharfedale Linton 3XP loudspeakers.

302.30 201.70



FERGUSON, McDONALD, CELESTION...

Our bargain system of the month.

Ferguson, McDonald, Celestion . . . three renowned names of the Hi-Fi world brought together by Comet to give you a perfectly-matched system at a price you can afford to pay. Our experts chose this system - which is why you can choose it with confidence.

FERGUSON 3477 TUNER-AMPLIFIER

First, we took the Ferguson 3477, a stereo FM tuner-amplifier with a performance in keeping with its sleek good looks. Delivering a full 17 watts of audio power per channel, the 3477 gives superb FM reception and incorporates AFC and 6 preset tuning controls.

MCDONALD BDS 95 TURNTABLE MODULE

Next, we selected the McDonald BDS 95 - a belt-driven turntable that's high in performance and low in rumble, hum, and wow and flutter. The slimline teak-finish plinth with its satin black and aluminium trim, and friction-hinged translucent dust cover, houses transcription engineering at its best. For the S-shaped tonearm we decided on an ADC magnetic cartridge. And this makes very sound sense indeed.

CELESTION HADLEIGH LOUDSPEAKERS

Obviously, we needed high quality speakers to complete this super system. And so our experts unanimously recommended a pair of Celestion Hadleigh's. These bookshelf units handle 20 watts DIN - producing a quality and depth of sound that you'd normally expect from speakers twice the size and price.

This is a system you'll be proud to own - a system you can afford to own. Put together by Comet specialists to bring you high fidelity listening at a down-to-earth price.

COMET PRICE £122.70

ALBA UA900 amplifier 2 x 33 watts RMS with McDonald BDS95 belt drive turntable fitted ADC magnetic cartridge plus two Goodmans R835 loudspeakers. — 209.70

MARANTZ 1030 amplifier 2 x 15 watts RMS with Sansui SR222P belt drive turntable, base, cover and Shure M75ED magnetic cartridge plus two Marantz 4G loudspeakers. — 287.88 211.60

AKAI AA1010 tuner amplifier 2 x 14 watts RMS with Sansui SR222P belt drive turntable, base, cover and Shure M75ED magnetic cartridge plus two Celestion Hadleigh loudspeakers. — 213.60

ROTEL RX202 AM/FM/MPX tuner amplifier 2 x 20 watts plus Garrard 125SB belt drive turntable plinth, cover and Shure M75/6/SM cartridge with two Goodmans RB20 loudspeakers. — 216.70

TRIO KR2600 AM/FM tuner amplifier 2 x 15 watts RMS with Trio KD1003 belt drive turntable complete with plinth, cover and Trio magnetic cartridge plus two Wharfedale Linton 3XP loudspeakers. — 320.16 227.90

PIONEER SX450 AM/FM/MPX tuner amplifier 2 x 15 watts with PL112D belt drive turntable inc. plinth, hinged cover and Audio Technica AT13EA magnetic cartridge plus two Wharfedale Linton 3XP loudspeakers. — 245.60

ROTEL RA412 amplifier 2 x 25 watts RMS plus Sansui SR222P belt drive turntable base, cover, fitted with a Shure M75ED magnetic cartridge plus two Wharfedale Glendale 3XP loudspeakers. — 358.52 246.60

MARANTZ 2215B tuner amplifier 2 x 15 watts RMS with a Phase Locked Loop FM demodulator, plus Sansui SR222P belt drive turntable, base, cover and Shure M75ED magnetic cartridge with two Wharfedale Linton 3XP loudspeakers. — 349.15 247.60

SYSTEMS COSTING OVER £250

ROTEL RA712 amplifier 2 x 40 watts RMS plus Sansui SR222P belt drive turntable, base, cover and Shure M75ED magnetic cartridge with two Wharfedale Glendale 3XP loudspeakers. — 385.22 257.60

AKAI AA1020 AM/FM/MPX tuner amplifier 2 x 20 watts RMS plus Sansui SR222P turntable inc. base and cover and Shure M75ED magnetic cartridge and two Wharfedale Linton 3XP loudspeakers. — 417.75 267.60

PIONEER SX550 tuner amplifier 2 x 20 watts plus Pioneer PL112D belt drive turntable and Audio Technica AT13EA magnetic cartridge with two Wharfedale Linton 3XP loudspeakers. — 275.60

ROTEL RX402 AM/FM/MPX tuner amplifier 2 x 25 watts RMS plus Sansui SR222P belt drive turntable, base, cover and Shure M75ED magnetic cartridge with two Wharfedale Glendale 3XP loudspeakers. — 441.12 282.60

ROTEL RX602 AM/FM/MPX tuner amplifier 2 x 35 watts RMS plus Sansui SR222P turntable and Shure M75ED magnetic cartridge with two Wharfedale Glendale 3XP loudspeakers. — 507.12 307.64

AKAI AA1030 AM/FM/MPX stereo tuner amplifier 2 x 30 watts RMS plus Sansui SR222P belt drive turntable, base, cover and Shure M75ED cartridge plus two Wharfedale Glendale 3XP loudspeakers. — 478.22 322.60

PIONEER SX650 tuner amplifier 2 x 35 watts RMS plus Pioneer PL112D belt drive auto return turntable and Audio Technica AT13EA magnetic cartridge with two Goodmans RB35 loudspeakers. — 360.60

GOODMANS Module 150 tuner amplifier MW/LW/FM/MPX with 8 pre-set FM push button tuner, Garrard DD75 direct drive turntable with base, cover and Shure M95ED cartridge plus two Goodmans Achromat 400 loudspeakers. — 473.60



The Complete Hi-Fi Service

All branches are open daily to the public

Monday-Friday 9 a.m.-8 p.m. Saturday 9 a.m.-5.30 p.m. Scottish Branches also open Sundays 10 a.m.-5.30 p.m.

SCOTLAND

Table listing Scottish branches including Dundee, Dunfermline, Edinburgh, Glasgow, Kilmarnock, and Northern England branches like Barrow-in-Furness and Birkenhead.

Table listing branches in the Midlands and South, including Stokeckton, Sunderland, Wakefield, Wigan, York, Birmingham, Mansfield, Northampton, Norwich, Nottingham Derby, Nuneaton, Shrewsbury, West Bromwich, Willenhall, and Wolverhampton.

Table listing branches in the South, including London (Hackbridge, Haves, LONDON, LONDON), South (Bedford, Bournemouth, Brighton, Cambridge, Eastleigh, Guildford, Ipswich, Luton, Oxford, Portsmouth, Reading, Rochester, Southampton), and Wales & South West (Bath, Bristol, Cardiff, Exeter, Gloucester, Newport, Plymouth, Torquay, Swansea).

*These branches carry records and tapes at discount prices

ORDERING BY MAIL

Send your requirements to the nearest of the 3 Comet Warehouses listed below, including the appropriate delivery charge in your cheque or postal order, made payable to "COMET."

MAIL ORDERS TO BE SENT TO THE NEAREST OF THE THREE ADDRESSES -

- LEEDS 78 Armlay Road, LS12 2EF
EDINBURGH 1 Newhaven Road, EH6 5QX
HACKBRIDGE (London) 190 London Road, Hackbridge, Wallington, Surrey

Postage and Packing (per item): Cartridges 30p; Bases and Covers 75p; Headphones 75p; Pick-up Arms 75p; Headshells 30p; Chassis Speakers 75p; Blank tapes - per order, irrespective of quantity; Spool tapes 50p; Cassettes 30p; 8-track cartridges 30p.

ORDERING BY PHONE

For telephone orders simply phone your nearest Comet branch and pay the driver on delivery. Comet also offer an extra service for all ACCESS or BARCLAYCARD holders.

CREDIT FACILITIES

Any item or number of items whose total value exceeds £60 can now be purchased on Credit on Comet's discounted prices over 8, 12, 24 and 30 months. Send your requirements to the Mail Order Department (address at right) marked "Credit Mail Order" and we will send you by return of post an application form and details of our repayment terms - all entirely without obligation.

on Comet Discount Prices (AVAILABLE ON MAINLAND ENGLAND, SCOTLAND AND WALES)

NOW OPEN COMET in JERSEY

9 Commercial Buildings, St. Helier Tel: 0534 72501

Prices are as those operating in the U.K. excluding VAT, but with a small island transportation charge included.

Securicor Delivery All in stock items will be delivered by Securicor within 72 hours from receipt of order (Add £3.50 for Securicor delivery). All goods are fully insured against loss or damage whilst in transit.

Order by Mail, or Telephone Leeds 0532 40551. London 01 669 4321. Edinburgh 031 554 4454. using ACCESS or BARCLAYCARD.



All prices quoted in Comet's Advertisements are correct at time of going to press.

COMET DISCOUNT WAREHOUSE

Mail Order Department, 78 Armlay Road, Leeds LS12 2EF.

These facilities are also available to personal callers at all branches: no deposit credit terms over 9 months, goods delivered on first month's payment in advance.

One Degree Under? SEE A SPECIALIST!

Just as you don't have your appendix removed by the local butcher, don't be advised on your hi-fi by a washing machine salesman.

A hi-fi specialist, unlike most hi-fi shops, buys a restricted range of products that he finds of particularly good value for money. We, at Hampshire Audio, do restrict your choice as a result of our wealth of practical day-to-day experience. Come to 8 Hursley Road in Chandlers Ford and listen, with the aid of our special volume compensating comparator, to selected items from the ranges of Aiwa, AR, Armstrong, B & W, Celef, Celestion UL, Chartwell, DBX, Decca Special Products, Fons, Gale, Grace, Harman-Kardon, IMF, JRI49, KEF, Linn-Sondek, NAD, Nakamichi, Ortofon, Pioneer, Quad, Revox, Sansui, SMC, Spendor, Sony, Stanton, Stax, J. E. Sugden, Tandberg, Tannoy, Teac, Technics, Trio and Yamaha.

- COMPARATOR DEMONSTRATIONS IN TWO STUDIOS
- OPEN THURSDAYS UNTIL 8 p.m.
- OVER-THE-COUNTER EXPORT
- EXTENSIVE FREE PARKING ON OUR FORECOURT
- ACCESS ACCEPTED BY TELEPHONE, BARCLAYCARD AND MAIL ORDER
- ALL EQUIPMENT CHECKED BEFORE SALE AND COVERED BY OUR OWN 2-YEAR LABOUR AND PARTS GUARANTEE
- TAPE BY FUJI, MAXELL, SONY AND TDK AT SPECIAL DISCOUNT PRICES

HAMPSHIRE AUDIO LTD.

8 & 12 HURSLEY RD, CHANDLER'S FORD, HANTS.

Telephone: (04215) 2827 & 65232
All postal enquiries must have a S.A.E.

BBC MATRIX H DECODER

COMPCOR

LISTEN TO THE BBC QUADRAPHONIC BROADCASTS
INTRODUCTORY OFFER!



QS Variomatrix, Decoder Synthesizer together with BBC Matrix H facility. £99.00 inc. VAT (SQ and CD-4 extra)



DECODER SYNTHESIZER

- Type A Variomatrix
- QS Synthesizer (Hall and Surround)
- BBC Matrix 'H' option included



DECODER

- Full Logic
- Variable Blend or Proportional Variable Blend



DEMULATOR

- Dual Band ANRS
- State of the art muting

This range of Surround Sound modules has been specifically designed to enable audio enthusiasts to expand their existing stereo equipment to Surround Sound capability.

An important feature of the COMPCOR range is the versatility offered in that each system module may be purchased separately and will operate independently of the others. The modules have been designed in such a way that each plugs into a specified place within the control box so that the system may be expanded, if and when required, to incorporate any of the above Surround Sound systems. In addition, spare switching facilities have been built in to allow for additional Surround Sound modules to be added at a later stage.

For more information contact

COMPCOR ELECTRONICS LIMITED

9 Dell Way, London W13 8JH.

Telephone: 01-998 8221.

MANCHESTER HI-FI

LLOYD PATON LTD

WHERE THE **DEAREST**
IS THE **CHEAPEST**

WE ARE THE BEST IN MANCHESTER, FOR PERSONAL SERVICE, COMPARATOR DEMONSTRATIONS, & PRICES

AGENTS FOR: AR, CASTLE, DUAL, EMPIRE, GARRARD, HARMON KARDON, JVC, ISOPHON, JENSON, KEF, LNB, MARANTZ, MONITOR AUDIO, MORDAUNT SHORT, NAD, PIONEER, NAKAMICHI, QUAD, SANSUI, SHARP, SHURE, TANNOY, TRIO, LUXMAN, MICROSEIKI, VIDEOTONE, YAMAHA ETC.

**34 MOORFIELD WALK (SHOPPING PRECINCT)
URMSTON, MCR. M31 1TT**

M63 MOTORWAY Follow Stretford for Urmston	CREDIT. WE CAN ALSO OFFER INSTANT CREDIT BALANCE UP TO £ 300.00 FOR £30.00 CHEQUE OR CREDIT CARD HOLDERS
CAR PARK 400 CARS	BARCLAYCARD, ACCESS ETC—TRICITY FINANCE
PHONE 061-747 9722	
OPEN 9.30-5.30 MONDAY-FRIDAY, SATURDAY 9.30-12.00 WEDNESDAY 9.30-7.30 TUESDAY & THURSDAY	

MATHERS for TAPE

SAVE POUNDS AT THESE PRICES!

CASSETTES—PRICE PER 10				REELS—PRICE PER 5			
	C60	C90	C120	BASF LHS		Scotch D.	Sony SLH
SONY K	£5.95	£8.25	£11.20	5" LP 900'	£14.32	£13.50	—
HF	£8.40	£10.00	£12.75	DP 1200'	£18.53	£16.50	—
Chrome	£12.50	£16.45	—	TP 1800'	—	£21.75	—
FeCr	£14.00	£19.50	—	5½" LP 1200'	£17.12	£16.50	—
BASF LH	£6.30	£8.40	£11.45	DP 1800'	£26.95	£21.75	—
LHS	£9.25	£12.05	£15.90	TP 2400'	—	£27.35	—
Chrome	£12.20	£15.25	£19.80	7" LP 1200'	—	—	£13.35
FeCr	£15.25	£19.80	—	LP 1800'	£24.14	£21.75	£17.00
TDK D	£5.58	£7.67	£10.35	DP 2400'	£33.26	£27.35	£26.50
SD	£7.21	£9.42	£13.72	TP 3600'	—	£39.60	—
AUDUA	£9.88	£13.37	—	10½" SP 2400'	—	—	£35.90
SA	£10.46	£14.18	—	LP 3600'	—	—	£43.50
FUJI FL	£7.00	£9.60	£12.70	TDK: 7" LP 1800'—£13.70.			
FX	£9.60	£13.50	—	AUDUA: 10½" LP 3600'—£38.90.			
MAXELL				And now TDK AUDUA Back-coated: 7" LB 1800', £16.65; 10½" LB 3600', £46.75.			
LN	£6.63	£8.60	£11.04	8-TRACK BLANKS SCOTCH AND TDK			
UD	£12.20	£13.83	£18.83	SCOTCH Dynarange TDK Super Dynamic			
UDXLI	£14.53	£18.59	—	Playing Price Price Playing Price Price			
TDK in C45's: D, £4.88; SD, £6.39; AUDUA, £8.72.				time per 5 per 10 time per 5 per 10			
				45 min £6.50 £11.70 40 min £6.18 £11.40			
				90 min £7.50 £13.70 80 min £8.07 £14.90			

POSTAL CHARGES

CASSETTES: 70p on 10; 80p on 20; 90p on 30; £1.00 on 40. 8-TRACK: 60p on 5, 70p on 10. REELS: 90p on 5; £1.25 on 10s. 10½": £1.25 on 5; £1.95 on 10.

BARCLAYCARD/ACCESS . . . with pleasure.

We hope you can avail yourself of our rapid MAIL/TELEPHONE ORDER SERVICE. Every item advertised here is regarded by us as a stock line, only our suppliers running out can damage this criterion. All prices include V.A.T. MAIL ORDER . . . send cheque, postal orders, money order or quote your BARCLAYCARD/ACCESS number and your address. B.F.P.O. addresses supplied with pleasure. Please state on your order "Return remittance if out of stock" or "you may hold this order for weeks, if out of stock". TELEPHONE ORDERS . . . just quote your BARCLAYCARD/ACCESS number and address. We will tell you our stock position and despatch within hours, where possible. We reserve the right to change prices without notice. E. & O.E. PRICES CORRECT AT 16/5/77.

15 BRADSHAWGATE, BOLTON, LANCs. 'PHONE 0204 25100

LAST YEAR 50,000 TELETAPE CUSTOMERS FOUND THE ANSWER TO INFLATION!

They knew we are never scared to quote our prices in the ad. They knew we always maintain pre-increase discount prices while stocks last. Just look at these few examples from our wide selection including all the great names we dare to discount.

AR 16	£132.00
AIWA TP748	£64.00
AIWA TPR300A	£111.00
AIWA TPR910	£125.00
AIWA AF3060	£232.00
B&O Beolit 707	£64.00
B&O Beomaster 1100	£149.00
B&O Beogram 3400	£145.50
B&O Beocord 1100	£141.00
CELESTION Ditton 15	£102.00
NATIONAL SG2080	£315.00
NATIONAL RQ312SD	£34.50
NATIONAL RS269	£85.00
NATIONAL RQ546	£64.00
NATIONAL TR602GB	£75.00
NATIONAL GX400	£61.00
JVC JRS100	£127.00
JVC CD1635 MkII	£204.00
JVC 9475LS	£136.00
JVC 3050UK	£123.00

All prices include VAT at 12½%

PERSONAL EXPORT for UK visitors at Cash and Carry Tax Free prices

DIRECT EXPORT for goods shipped overseas, fully insured, at discount Tax Free prices. Write for delivery quote.

ACCESS AND BARCLAYCARD WELCOME. CREDIT TERMS FOR PERSONAL SHOPPERS.



ALL EQUIPMENT IS BRAND NEW FULLY GUARANTEED AND OFFERED WITH FULL AFTER SALES SERVICE.

PROMPT EFFICIENT MAIL ORDER SERVICE Goods despatched within 24 hours of receipt of order. (Subject to availability of stock) Cheerful Refund. If within 7 days of purchase any item is found to be faulty, we will gladly refund the full purchase price or replace the faulty item.

AGENTS FOR: Aiwa, ADC, AR, BASF, B&O, Celestion, Dual, Fuji, JR Loudspeakers Model JR149, JVC, Koss, Maxell, National, Nordmende, Quad, Revox, Roberts, Saba, Shure, Sony, Spendor, Sugden, Tannoy, Teac, Technics, TDK, Thorens, Trio, Uher, Wollensak

TELETAPE

33 Edgware Road, W2. Tel: 01-723 1942/2924
Open 9a.m. 5.30p.m. Monday-Saturday.



84/88 Shaftesbury Ave., W1 Tel: 01-437 1651.
Open 9a.m. 5.30p.m. Monday-Saturday.



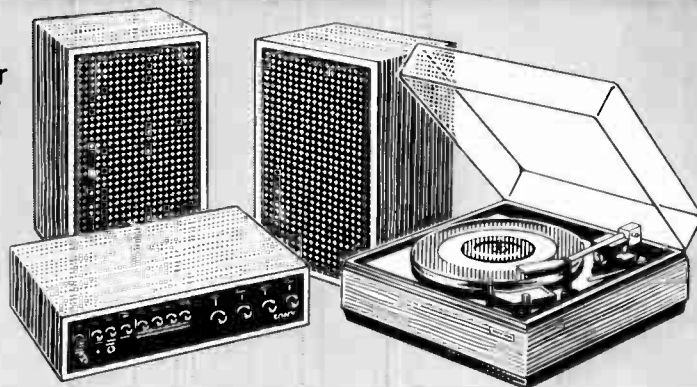
Carriage prices Mainland only. Prices correct at time of going to press but subject to change without notice.

SYSTEM 1

Sony TA70 Amplifier
Garrard SP25 Mk IV
2x Sony SS70
Speakers

TELETAPE PRICE
£109.00

Carriage £3.95



SYSTEM 2

Technics SU7200
Amplifier
JVC JLA-15 Record
Player
2x AR7 Speakers

TELETAPE PRICE
£215.00

Carriage £4.50



SYSTEM 3

Sony HMK 70 Music
Centre
with Dolby Cassette
complete with Speakers

TELETAPE PRICE
£379.00

Carriage £4.95



SYSTEM 4

JVC JRS-200L
Tuner/Amplifier with
S.E.A. Controls
Aiwa AD6300 Cassette Deck
2x Technics SB202
Speakers

TELETAPE PRICE
£485.00

Carriage £4.95



Our discount prices will save you money...post-haste

Leak & Wharfedale prices lower than you bargain for



Leak Prices

3400 Receiver	£189-00
3200 Receiver	£149-95
3900A Amplifier	£248-95
2030 Speakers (pair)	£78-00
3020 Speakers (pair)	£79-95
2060 Speakers (pair)	£119-95
3030 Speakers	£107-50
3050 Speakers	£146-95
3080 Speakers	£229-95

Wharfedale Prices

Denton 2XP Speakers (pair)	£39-95
Linton 3XP Speakers (pair) ..	£56-95
Glendale 3XP Speakers (pair)	£79-95
Airedale SP Speakers (pair)	£189-80
Dovedale SP Speakers (pair)	£139-95
Kingsdale 3 Speakers (pair)	£119-95

Personal Shoppers

If you live close to an Andrew McCulloch branch call in and see for yourself the wide range AND the low prices which our bulk-buying scheme produces. 24 KING STREET, CAMBRIDGE. Telephone 0223 64420. 9 ANGEL PAVEMENT, ROYSTON. Telephone 0763 43068. 5 THE MALL, BAR HILL, CAMBS. Telephone 0954 80572.

HFN

Please send me Post-Haste:

Credit by Post. Please send me an application form, U.K. mainland only.

Name _____

Address _____

Signature _____ Date _____

I enclose cheque for £ _____

I wish to pay by Barclaycard/Access/Diner's Club (please delete)

My account number is

ANDREW McCULLOCH POST-HASTE

CUT OUT AND MAIL THIS TODAY! To Andrew McCulloch
11 Nuffield Road, Green
End Road, Cambridge CB4 1TF.
Telephone: 0223 66766

KJ Leisure + TANNoy

Adds up to a good deal!

Our 'Meet or Beat' pricing policy means that KJ gives you the double advantage of getting the best available prices on Tannoy plus the security of dealing with one of the country's long established and highly respected dealers.

These fine British speakers are so efficient they can be driven from much lower powered amplifiers than you might expect and KJ's Watford shop carries the complete range of Tannoy in stock and on demonstration.

Come and give them a listen because you won't get a better deal anywhere.

Instant credit is possible and we accept payment by Access or Barclaycard.

101, ST. ALBANS ROAD, WATFORD, HERTS

Tel.: Watford 45250 Hours:
Mon.-Sat. 9.30 a.m.-5.30 p.m.
(Thurs. until 8 p.m.).

Here's the answer to all your Hi-Fi storage problems!



FREE COLOUR leaflet

this **multi-way** MUSIC CONSOLE extension plinth gives adjustable length and a variety of layout combinations to suit your own requirements. Solid construction with heat/scratch resistant melamine surface. White (as illus.) ONLY £37-50 + £2-30 carriage. Also available in teak-style finish. Alternative designs available. (0752) 61668

Complete your Hi-fi installation with one of these elegant units. Ample record storage space. Shelves for amplifier/tuner etc. plus space for cassettes, books, and magazines. Attractive styling to give your stereo the prominence it deserves.

Size: Height 21-5"; Depth 15" - adjustable length extends from 48" to a full 82" wide span!

14 day money back guarantee

Don't delay - send now for your free colour leaflet to:

Leisure Time Ltd DEPT. N3, CROZIER RD., MUTLEY, PLYMOUTH.

**RING US FOR BEST
PRICES AND
SERVICE**
01-579 3718 01-567 8703

SONY®

PIONEER



AIWA® National Technics

HITACHI★SANYO★TOSHIBA★MITSUBISHI

● BANG & OLUFSEN ●

ALSO: CELESTION ★ TANNOY ★ WHARFEDALE ★ MORDAUNT-SHORT ★ LECSON
TANDBERG ★ ARMSTRONG ★ JR149 ★ SME ★ SHURE ★ IMF★ NATIONAL PANASONIC

MAIL ORDER

FULL SERVICE

EXPORT

CREDIT TERMS ARRANGED — FANTASTIC BARGAINS THIS MONTH!

MUSIC CENTRES

Sony HMK 20 & 30
Sony HMK 40A & 70
Sony Ex 1K & Ex 2K
National SG1020 &
1060
National SG1070 &
2070L
National SG2080
Aiwa 5050
Aiwa AF5080
Toshiba SM3500 &
SM3200
Hitachi SDT2680 & 269C
B & O NEW MODEL

CASSETTE DECKS

Sony TC117 & 1185D
Sony TC135 & 1365D
Sony TC138 & 1535D
Sony TC209 & 186
Sony TC204 & 2065D
Sony TC1775D
Sony ELCASET EL5
Sony ELCASET EL7
Technics RS263 & 273
Technics RS640 & 610
Technics RS630 & 671
Technics RS676

Pioneer CTF4141 &
5151
Pioneer CTF2121 &
6060
Pioneer CTF7070 &
8080
Pioneer 9191
Aiwa AD1250 & 1300
Aiwa AD1600 & 1800
Aiwa AD6300 & 6500
Beocord 1100

RECEIVERS

Sony STR7015 & 7025
Sony STR7035 & 7055A
Sony STR4800 & 5800
Sony STR6800SD
Technics SA5060 &
5150
Technics SA5160 &
5360
Technics SA5460
Pioneer SX1250 & 950
Pioneer SX850 & 750
Pioneer SX650 & 550
Pioneer SX450 & 300
Aiwa AF3060 (Cassette)
Aiwa AX7500
Beomaster 901 & 110C
Beomaster 2000 & 3400
Beomaster 4000 & 6000

AMPLIFIERS & TUNERS

Sony TA70 & ST70
Sony TA88 & ST88
Sony TA1630 & ST2950F
Sony TA2650 & ST3950
Sony TA3140F &
ST5130
Sony TA3650 & ST5950
Sony TA5650 &
ST5055L
Sony TA8650 & ST5066
Technics SU7200 &
ST7200
Technics SU7600 &
ST7600
Technics SU3500 &
ST3500
Technics SU8600 &
ST9600
Technics SU9600 &
SE9600
Pioneer SA5300 & 6300
Pioneer SA7300 & 7500
Pioneer SA8500 & 9500
etc.
Lecson

TURNTABLES

Sony PS1350 & 1700
Sony PS3300 & 4300

Sony PS6750
Technics new models
available
Technics SL110
Technics 10 Mk II
Strathearn
Beogram 1100 & 3400
Beogram 4002 & 6000

SPEAKERS

Celestion
Ditton 11, 15, 33
Ditton 44, 25, 66
UL6, 8 & 10
Acoustic Research
AR10x, 11, 12, 14
AR16, 7x, 4xa, etc.
Tannoy
Eaton, Devon, Cheviot

Berkeley, Arden

Technics
SB30, 40 & 102
SB202, 302, 402
SB501, 5000 etc.

Sony
SS70 & 5088
SS3050 & 5050
SS8150 & 1030
SS1050 & 2030
SS2050 & 2070

Wharfedale
Chevin, Denton,
Linton, Glendale,
Dovedale, Airdale, etc.

Also Mordaunt-
Short JR149,
B&W etc.

COLOUR & PORTABLE TV'S

13" Sony KV1340
18" Sony KV1818 Mk II
19" Hitachi CTP202
20" Sony KV2000 UB
14" National TC48G
18" National TC86G
20" National TC261G
14" Mitsubishi CP141B

20" Mitsubishi CT203B
19" Hitachi CTP202
5" National TR505G
11" Sony 110UK
12" National TR602G
14" National TR714G

also 22" NATIONAL COLOUR TV.

EALING TV & Hi-Fi Ltd

1, 3&4 THE PADDOCKS, POPES LANE, EALING, LONDON W5 4PA
OPEN: MON-SAT 9.30 A.M.-6 P.M. WED TILL 1.00 P.M.

SAVE 66'S on CASSETTE at CAVENDISH

BRITAIN'S LEADING CASSETTE CENTRE

TAPE RECORDERS-RADIO RECORDERS-STEREO RECORDERS/DECKS-DOLBY DECKS-MUSIC CENTRES
LATEST MODELS-LARGEST STOCKS-BIGGEST DISCOUNTS ON ALL FAMOUS MAKES

MUSIC CENTRES

Our Price **£325.95**

Our Price **£279.95**

CASSETTES

Our Price **£59.95**

Our Price **£109.95**

Our Price **£124.95**

SONY 560

SANYO 5502L
 Another first from Sanyo - a magnificent Hi-Fi Dolby Music Centre featuring LW/MW/FM stereo radio, Dolby cassette recorder with CRO2 normal tape facility, plus 2 speed, 2 precision turntable and tonearm, and auto skating device.

FREE Music Stand worth £9.95

SONY HMK70
 Top of the range music centre from Sanyo. Turntable with magnetic cartridge, integrated amp giving 70w total music power output & MW/LW & VHF stereo tuner. Also DOLBY stereo cassette deck & matching speakers.

FREE Music Stand worth £9.95

SHARP SG400
 A top quality model with LW/MW/SW/FM/FM.M.P.K. Stereo receiver with 5 F.M. pre-set buttons; stereo Dolby cassette deck with auto CRO2/normal tape selection, mech. pause & auto stop; belt-drive turntable. 25w. per channel.

ITT 720
 Attractive battery/mains cassette recorder. Features auto switch for FE/CRO2 tapes, auto recording level control, twin recording meters, auto-stop, pause, tape counter. Records in stereo/mono. Stereo playback through headphones (extra) or stereo system.

GRUNDIG C6000
 A superb Radio/Cassette from a world famous maker. 5 band radio with combined high quality cassette recorder. Battery/mains. Portable Beautiful sound.

Truly magnificent battery/mains portable STEREO cassette radio w/ VHF stereo/MW/SW. 2 W per channel, built-in cond. mke, normal/CRO2 tape selector, auto stop and headphone socket.

We are **DOLBY Music Centre Specialists** call and see our range **P & P add £3.50**

FREE Music Stand worth £9.95

Our Price **£299.95**

ROTEL 5010
 Beautifully matched model comprising a receiver giving 25w per channel and 0.5% max total harmonic distortion; turntable, belt driven, with speed control, 0.5% W & F, strobe scope; Cassette deck. 4 track-2 channel, Dolby, W & F of 0.08% chrome tapes.

Dolby Music Centres	
Aiwa 5080/5050	P.O.A.
Dynatron MC1010	276.95
Ferguson 3923	271.95
Hitachi 7675	P.O.A.
Hitachi 7680	349.95
JVC MC55	P.O.A.
National 2080-3090	P.O.A.
Sanyo 2811	269.95
Sony HMK 70	P.O.A.
Tandberg TR220	P.O.A.
Toshiba 3150	P.O.A.
Hacker M6000	309.95

Non-Dolby Music Centres	
GEC 2817	172.95
Hitachi ST 7620	P.O.A.
JVC 1845	P.O.A.
National 1020/1060	P.O.A.
National 2070	P.O.A.
Pioneer 6500	259.95
Sanyo 2711K	214.95
Sharp 315	189.95
Sharp 220	189.95
Sony EX1K	164.95
Sony EX2K	179.95
Sony HMK 40A	235.95
Toshiba SM 3100	P.O.A.
Teletunken 2514	209.95

Battery Mains	
Aiwa 772	P.O.A.
Philips 2215	41.95
Ferguson 3289	19.95
Ferguson 3276	26.95
National 305	P.O.A.
Hitachi 295	36.95
ITT SL 58	28.95
National 309	P.O.A.
Philips 2208	24.95
Philips 2214	32.95
Sanyo 2246	31.95
Sharp RD 600	24.95
Sony TC 63	30.95
Sony TC 150	87.95
Sony TC 207	52.95

Battery Mains/Radios	
Aiwa TPR300/216	P.O.A.
Ferguson 3283	44.95
GEC 900	42.95
Grundig 4100	76.95
Grundig C6200	155.95
Grundig 4200	79.95
Hacker RPC1	92.95
Hitachi TRK 5000	74.95
Hitachi TRK 5220	58.95
Hitachi 5210	39.95
Hitachi 5211	43.95
JVC 9201S	P.O.A.
National 514/546	P.O.A.
National 443	P.O.A.
National 554	P.O.A.

Philips AR 170	44.95
Philips 060	36.95
Sanyo 2422	48.95
Sanyo 2444	59.95
Sharp GF 6000	87.95
Sony CF 440	79.95
Sony CF470	89.95
Sony 210	65.95
Toshiba 2300	P.O.A.
Stereo Recorders/Battery Mains	
ITT 720	59.95
JVC KD2	P.O.A.
JVC 1635	P.O.A.
Sony TC 525	118.95
Sony 153 Special offer	156.95

P & P add £1

Our Price **£73.95**

IN-CAR

Amstrad 9070
 Superb new AM/FM stereo radio/stereo cassette player from Amstrad. Push button pre-select radio. 5w per channel output. Fast forward control. ALSO IN STOCK Amstrad 90-0 £68.95 Amstrad 90-1 £52.95

Our Price **£43.95**

PYE 2273
 Autoreverse Complete compact dual polarity unit with finger rip slider controls fast forward rewind. 5W per channel. Our amazingly low price includes superb quality Pye speakers.

PIONEER 2121
 Hi-Fi front loading Dolby Cassette Deck. Exceptional specification for its price

Our Price **£129.95**

PLUS FREE DOLBY TEST TAPE WORTH £2.95

AMSTRAD 7050
 Slimline stereo Dolby cassette deck featuring twin VU level meters, record level sliders, auto stop, tape counter, pause, CRO2 indicator, Phono, DIN headphone sockets. W & F D. 1%

Our Price **£92.95**

Our Price **£72.95**

AKAI 702 D
 Latest front load Dolby cassette deck at a budget price. Beautifully designed it comprises, LN/chrome tape selector, overlevel recording limiter switch, tape pause, twin VU meters and gives a min. motor rotation noise and a W&F of only 0.08%

Stereo Radio Cassette Battery Mains

CAVENDISH OFFER YOU THESE EXCEPTIONAL MODELS AT AMAZING PRICES.

Battery/Mains Stereo Radio

Aiwa 910	POA
Aiwa 940	POA
Hitachi TRK 5190	115.95
JVC 9475	POA
Sharp GF8080	109.95
Sony CF 560S	124.95
Sony CF 580	219.95

Our Price **£152.95**

PIONEER 8300
 Magnificent pre-set 3 band stereo radio/cassette player. LW/MW/FM stereo radio; auto eject, fast forward & rewind on cassette; fitted with new auto recep. control; W & F of less than 0.3%; 7W power. Free Radiomobile door mounted output. Free speakers worth £13.95

Our Price **£64.95**

SHARP 5300-STEREO CAR CASSETTE PLAYER
 Take your favourite music with you with our latest 3 wave band stereo radio/cassette player. 7 watts per channel, rewind and forward wind, auto eject.

Our Price **£117.95**

SONY TC186 SD
 Superb value front loading Dolby Cassette deck. Bias/equalisation switching. Normal or chrome tapes. Record level limiter. Wow & Flutter only .09%

Our Price **£117.95**

SONY TC186 SD
 Superb value front loading Dolby Cassette deck. Bias/equalisation switching. Normal or chrome tapes. Record level limiter. Wow & Flutter only .09%

Our Price **£92.95**

AKAI 702 D
 Latest front load Dolby cassette deck at a budget price. Beautifully designed it comprises, LN/chrome tape selector, overlevel recording limiter switch, tape pause, twin VU meters and gives a min. motor rotation noise and a W&F of only 0.08%

STEREO PLAYBACK	
Aiwa 1050	P.O.A.
Binatone RIV	23.95
Hitachi CS 270	61.95
Harry Moss 420	54.95
Harry Moss 329	34.95
H. Moss 330	44.95
Hitachi 220	44.95
National 1131	P.O.A.
Philips 060	40.95
Pioneer 151	P.O.A.
Radiomobile 321	35.95
Sanyo FT4020	35.95
Pye 2272	31.95
Pye 2263	43.95

STEREO & RADIO	
Hitachi 227	73.95
Harry Moss 333	46.95
Radiomobile 309	79.95
Philips 342	59.95
Radiomobile 315	88.95
Pye 2259	59.95
Taiyo CX55	42.95
Philips AC 460	89.95
National 440	P.O.A.
Pioneer 4400	P.O.A.

STEREO & RADIO	
Aiwa 2020	P.O.A.
Sonix 103	39.95
National 840	P.O.A.
Hitachi 4191	139.95
Pioneer 4300	P.O.A.
Pioneer 4000	P.O.A.
Pioneer 8300	P.O.A.
Pioneer 8000	P.O.A.
Pye 2256	66.95
Sharp 5200	59.95
Sony TC24F	67.95
Sharp 5350	76.95
Sharp 5750	86.95
Sharp 5751	72.95

Amstrad 7070	84.95
Aiwa 1250	P.O.A.
Aiwa 6300/6500	P.O.A.
Akai 705D	118.95
Akai 707D	135.95
Akai 740D	306.95
Ferguson 3280	64.95
Hitachi 2330	66.95
Technics RS640	—
Technics RS630/615	—
JVC 200/1770	P.O.A.
JVC 1740	P.O.A.
JVC KD 21	P.O.A.

Hitachi 2360	89.95
Hitachi D440	94.95
Nakamichi 600	P.O.A.
Philips 2511	96.95
Rotel RD10F	94.95
Sanyo 5300	115.95
Sanyo 5500	149.95
Sanyo 4055	83.95
Sony TC 138	169.95
Sony TC 204	149.95
Sony ELCASSET in Stock	—
Sony TC 209	225.95
Sony 177	359.95

PIONEER Super Buys

LATEST RANGE AT TREMENDOUS SAVINGS!

RECEIVERS	PL 1170	99.95
SX 450	112.95	
SX 550	139.95	
SX 650	203.95	
SX 750	243.95	
SX 850	322.95	
SX 950	368.95	
Cassette decks.		
CTF 6060	167.95	
CTF 7070	183.95	
CTF 8080	236.95	
CTF 9191	276.95	
Turntables		
PL 1150	65.95	

Save on cassette tapes FREE head cleaner with 10

PHILIPS	BASF	FUJI	FL	SONY	MAXELL LN	MEMO-REX	BASF SM	TDK D	SONY HF
C60	60p	60p	55p	60p	60p	75p	90p	63p	80p
C90	80p	80p	90p	80p	75p	1.10p	1.15p	83p	1.00p
CT120	1.10p	1.10p	1.15p	1.10p	95p	1.25p	1.50p	1.10p	1.40p

SPECIAL OFFER!
PHILLIPS VIDEO C60 TAPES
 AT ONLY **£17.95**

SPECIAL OFFER ON SHURE CARTRIDGES
 SHURE 75 ED 13.95
 SHURE 75 EJ 11.95
 SHURE 95 ED 17.95
 SHURE 95 EJ 12.95
 SHURE M55E 8.50
 SHURE VIS 43.95

Cavendish Sales

CASSETTE CENTRE

279/283 WHITECHAPEL RD., LONDON E1
 Tel: 01-247 3453 24 Hour Answering Service
 Right next door to Whitechapel Underground Station
 Open 9am - 6pm Mon-Sat

All Prices INCLUDE VAT
 The prices in this advertisement were finalised on 10/5/77 Please check prices and availability at time of purchase.

Phone your Access Barclaycard No. over with your order for prompt delivery
£325 INSTANT CREDIT
 Instant Credit of £325 available on production of Cheque Card or valid Credit Card (Min order £100)

SAVE £££s ON HI-FI at CAVENDISH

FANTASTIC DISCOUNTS ON FAMOUS MAKES

AMPLIFIERS

Our Price Only **£63.95**



PIONEER SA 5500

Basically, beautiful new stereo integrated amplifier at a popular price giving 15w. per channel min. RMS at 8 ohms, from 20 to 20,000 hertz, 0.5% max total harmonic distortion.

Our Price **£73.95**



SONY TA 1630 STEREO AMPLIFIER

22w per channel RMS. Frequency response 20-20,000 Hz. Max harmonic distortion. 0.5% at 22w. Inputs for Phono, Tuner, Aux and 2 Tapes. Presence and Loudness control switches.

AMPLIFIERS	£
Akai AM 2400	124.95
Amstrad 2000	41.95
JVC JAS 11	P.O.A.
JVC JAS 31	P.O.A.
Pioneer SA6300	79.95
Rotel 712	103.95
Sansui AU 2300	63.95
Sony TA73	53.95
Sony 2650	106.95
Sony TA 3650	145.95
Technics SU 7200	—
Technics SU 7600	68.95
Trio KA 1500	P.O.A.
Yamaha CA 410	P.O.A.
Yamaha CA 610	P.O.A.

TUNER AMPLIFIERS

Our Price **£112.95**



PIONEER SX 450

High performance FM/AM Stereo Receiver. 15 watts per channel. Less than 0.5% total harmonic distortion. Phono equaliser. Facilities for connection of 2 sets of speaker systems. Stereo tape deck input/output circuit.

Our Price **£84.95**



AMSTRAD 5050

Another winner from Amstrad! New highly advanced tuner amplifier giving 20 watts per channel output. MW/LW/FM stereo radio, stereo balance control, signal strength meter, headphone & stereo/quad. speaker sockets, plus many other features.

TUNER AMPLIFIERS	P.O.A.
Aiwa AX 7100	P.O.A.
Akai 1020	142.95
JVC JRS 100-600	P.O.A.
Hitachi 3025	99.95
Leak 3200	154.95
Rotel RX603	204.95
Rotel 202	99.95
Sansui 331	94.95
Sony STR2000	133.95
Sony STR1800	99.95
Sony STA 4800	199.95
Technics SA 5060	—
Toshiba SA 320	P.O.A.
Trio 2600	108.95
Yamaha CR200E/600P.O.A.	P.O.A.
Yamaha CR820	P.O.A.

STEREO TUNERS

Our Price **£41.95**



AMSTRAD 3000 (tuner)

Hi-Fi AM/FM Stereo tuner. Highly sensitive FM cover plus LW and Mw. Stereo separator. 44dB. Signal/Noise 63 db on Stereo. Built-in AM Ferrite aerial. Fine tuning meter and push button selection.

Our Price **£88.95**



SONY 2950

Superbly designed stereo tuner featuring LW/MW/ SW/VHF, phase locked loop decoder, uniphase filters, tuning and signal meters, easily readable linear dial scale. Amazing value for such a high performance tuner.

STEREO TUNERS	P.O.A.
Akai AT 2600	143.95
JVC JTU 31	P.O.A.
National ST 2300	P.O.A.
Pioneer TX 9500	180.95
Pioneer TX 7500	140.95
Pioneer TX5500	73.95
Rotel 224	61.95
Rotel 724	93.95
Sansui TU3000	90.95
Sony ST 73	53.95
Sony 3950	142.95
Trio KT 5300	98.95
Technics ST 7200	—
Technics ST 7600	—
Yamaha CT 410	P.O.A.
Yamaha CT 610	P.O.A.

TURNTABLES

Our Price **£67.95**



PIONEER PL112D

Superb 2 speed belt drive turntable. Fitted with 4-pole synchronous motor producing 63dB of S/N, 0.07% W & F max. Also has anti-skating device, lateral balancer and 'S' shaped pipe arm. Walnut grain finish.

Our Price **£69.95**



JVC JLA 15

Superb semi-automatic Belt-Drive Turntable with TH Tonearm. Auto return and shut-off power, 4 pole synchro motor, cueing mechanism and anti-skating system. Complete with Shure 75E0 Cartridge.

TURNTABLES	P.O.A.
Garrard 86	66.95
Garrard 0D75	96.95
JVC JL A45/15	P.O.A.
Leak 3001	88.95
Hitachi PS/17/48	P.O.A.
Akai AP 1001	64.95
Rotel RP 1500	69.95
Rotel RP3300	73.95
Sony PS 3300	113.95
Pioneer PL1170	99.95
Sony 1450	57.95
Sony 4300	139.95
Technics SL23/150	—
Technics SL1200/1700	—
Trio KD 1033	53.95
Yamaha YP 211	P.O.A.

SPEAKERS

KEF Complete range P.O.A.	P.O.A.
AR6/7/12/14/16	P.O.A.
Leak 3020	87.95
Leak 3050	107.95
Leak 3030	119.95

Celestion UL6/8/10	P.O.A.
Celestion DIT15	88.95
Celestion Ditton 22	117.95
Celestion Ditton 33	137.95
Castle Richmond	62.95
Castle Kendal	89.95

Castle Conway	133.95
Sony 2050	112.95
Technics S8102	—
Wharf Denton XP	44.95
Wharf Dovedale	149.95
Wharf Linton XP	62.95

CAVENDISH Sales

CASSETTE CENTRE

279/283 WHITECHAPEL RD., LONDON E1
Tel: 01-247 3453 24 Hour Answering Service
Right next door to Whitechapel Underground Station
Open 9am-6pm
Mon-Sat

£325 INSTANT CREDIT
Instant Credit of £325 available on production of Cheque Card or valid Credit Card (Min. order £100)

Phone your Access/Barclaycard No over with your order for prompt delivery
P&P add £1

For a musical sound-try EMPIRE

2000E

An inexpensive cartridge with a good specification.
Frequency response range: 20Hz - 20kHz - 3dB.
Tracking force range: 1 1/4 - 2 1/2 gms.
Price: £12.26 including V.A.T.



2000E-I

Our popular cartridge suitable for use with a wide variety of turntables.
Frequency response range: 20Hz - 20kHz - 3dB.
Tracking force range: 1 - 2 gms.
Price: £17.43 including V.A.T.



2000E-III

Our best seller - already the subject of many good reviews.
Frequency response range: 20Hz - 20kHz - 2dB.
Tracking force range: 3/4 - 1 1/2 gms.
Price: £21.60 including V.A.T.



2000Z

The top of the range of our stereo cartridges.
Frequency response range: 20Hz - 20kHz - 1dB.
Tracking force range: 3/4 - 1 1/4 gms.
Price: £67.50 including V.A.T.



4000D-I

This model is suitable for four channel systems including CD-4 and is compatible with stereo systems.
Frequency response range: 15Hz - 45 kHz - 3dB.
Tracking force range: 1 - 1 1/4 gms.
Price: £33.18 including V.A.T.



For further details of specification, please contact your local dealer or send the cut-out coupon for a free copy of the brochure. Suggested retail prices are quoted and include V.A.T. at the rate applicable at the time of going to press.

Please send me a free copy of 'How to get the most out of your records'.

Name _____
Address _____

HAYDEN LABORATORIES LTD
Hayden House, Churchfield Road, Chalfont St. Peter,
Bucks, SL9 9EW Tel: Gerrards Cross 88447 Code HFN677

LOUDSPEAKER with a PEDIGREE

Harbeth is a new name among speaker manufacturers and their Type HL Monitor is fresh off the production line, yet we knew it had to be good because it was designed by H. D. Harwood who, in the course of 30 years at the BBC, headed the design team which produced the prototypes for the Spondor BCL and, more recently, the sensational LS3/5A miniature monitor. In fact, we think that the Harbeth HL Monitor, now on demonstration at our studio, is a superb speaker—perhaps the finest yet produced for listening to good music in normal domestic surroundings.

Measuring 25 x 13 x 12 in. and costing £270 plus VAT per pair, the HL Monitor is a two-way system capable of handling up to 100 watts programme, its vented, teak-finished enclosure designed to BBC standards and its 8 in. bass unit using a plastic cone of a new material which is being patented in all principal countries. Come and hear this new 'pedigree speaker' at Moscow Road, alongside the other members of our distinguished family as well as our hand-picked range of models by KEF, Spondor, Chartwell, Gale *et al.*, together with record and cassette decks, amplifiers, tuners and receivers to suit every pocket.

LIVE RECORD REVIEW, our free recital featuring the latest record releases, which takes place each Saturday afternoon from 2 to 4.30, allows you to listen at leisure and in pleasant company to a

variety of fine loudspeakers and, once the official programme is over, we are always happy to discuss equipment or records and to give comparative demonstrations. When you buy equipment from us, you not only gain the benefit of advice based on unequalled knowledge, experience and musical understanding, but you have the assurance that every component has been thoroughly tested by us and will be expertly installed in your home without extra charge. Also at your disposal is our comprehensive after-sales service, while our generous record and tape discount scheme further benefits all who purchase equipment from us. If you cannot visit our studio or if you want something to mull over before consulting us in person, please write to us giving some indication of your requirements and we shall be glad to send you details of recommended components suited to your needs.

SUMMER SALE

Our customary Summer Sale takes place from July 1st to September 30th and, as ever, features many equipment bargains and a constantly replenished selection of half-price LP discs—callers only. In addition, any new equipment purchased or ordered during this period will be subject to a generous 'cash discount'.

Thomas Heinitz Ltd.

MUSIC IN THE HOME

35 MOSCOW ROAD QUEENSWAY LONDON W2 TEL: 01-229 2077

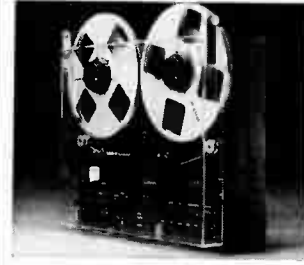
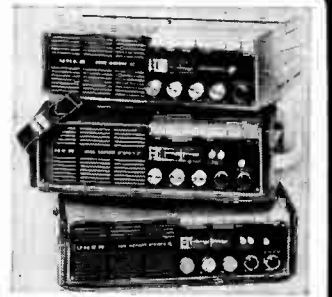
Basic opening hours:

Mon. Tues. Wed. Sat. 9.30-5.30; Thurs. 9.30-1; Fri. 9.30-7

REW MAIN LONDON DISTRIBUTORS FOR UHER

4000 SERIES PORTABLE RECORDERS

These professional open-reel machines are widely used by broadcasting authorities the world over. Available in mono or stereo, half or quarter track. Features 4 speeds; A.L.C. We carry a wide range of accessories for these machines.



UHER SG630 LOGIC

This features 4 Motor Omega Loop Drive, 3-speed interchangeable Head Block, built-in Sel Sync and Sound on Sound. Also many other advanced professional features.

- REW Professional Audio, 126 Charing Cross Road, and 17 Denmark Street, London WC2. Tel.: 01-836 2372/7851.
- 230 Tottenham Court Road, London W1. Tel.: 01-637 2624/5.
- Mail orders to: REW House (Dept HFN), 10-12 High Street, Colliers Wood, London SW19. Tel.: 01-540 9684/5/6.

Comfortable winners from SENNHEISER



As well as these three superb headphones, Sennheiser recently introduced a new closed ear headphone the HD 224X. This new model is already being used by many discerning audiophiles. For a demonstration of any of these headphones, contact your local dealer today and join the family of Sennheiser enthusiasts.

To learn more about the equipment, write for a brochure or consult your local Sennheiser dealer.

HAYDEN

HAYDEN LABORATORIES LTD
Hayden House, Churchfield Road, Chalfont St. Peter,
Bucks, SL9 9EW Tel: Gerrards Cross 88447

Please send more details on Sennheiser Headphones
Name.....
Address.....

HFN/577

'TOP END' SUPER BUYS AT KJ!

Due to reorganisation of our main demonstration area we are clearing most of our demonstration stocks at dramatically reduced prices. In most instances there is only one of each model so it's first come first served. All the equipment offered is in full working order and carries the distributor's guarantee.

	List Price	Clearance Price		List Price	Clearance Price
ACOUSTIC RESEARCH					
AR16 Speakers (pr)	£156.37	£109.90	LUX		
AR11 Speakers (pr)	£408.36	£275.00	C1000 Pre-amp ..	£686.25	£549.00
AR10 Speakers (pr)	£553.50	£359.00	M6000 Power amp	£1856.25	£1485.00
AMCRON					
IC 150 Pre-amp ..	—	£199.90	MONITOR AUDIO		
IC 150A Pre-amp ..	£415.00	£369.00	MA 3 Mk I Spkrs (pr)	£303.75	£239.00
D 60 Power amp ..	£320.62	£279.00	MA 1 Mk II Spkrs (pr)	£309.37	£229.90
D 150A Power amp	£522.00	£459.00	MA 3 Mk II Spkrs (pr)	£400.50	£299.00
BGW					
202 Pre-amp ..	£499.00	£379.90	NAKAMICHI		
250B Power amp ..	£467.00	£369.90	700 Cassette Deck	£598.40	£489.90
500D Power amp	£777.00	£632.90	Slimline Mon. Spkrs (pr)	£599.85	£449.00
CELEF					
Studio Pro Speakers (pr)	£506.25	£430.00	PHASE LINEAR		
DENON					
I03 5 Cartridge ..	£140.00	£109.00	400B Power amp ..	£508.50	£419.00
DBX					
I17 Noise Reduction	£154.00	£129.90	2000 Pre-amp ..	£294.75	£245.00
I19 Noise Reduction	£174.00	£147.90	RADFORD		
I22 Noise Reduction	£244.00	£207.00	ZD 22 Pre-amp ..	£196.80	£167.00
DIRECT DESIGNS					
DRS 1/Formula 4 Turntable	£185.60	£149.90	REVOX		
DRS 1/SME 3009 Turntable	£185.60	£149.90	A700/1372 Tape Deck	£1188.00	£950.00
DUAL					
C5 510/M95D Turntable ..	£136.51	£115.00	A720 Pre-amp ..	£967.50	£775.00
C5 701/V15 III Turntable ..	£216.00	£179.95	A740 Power amp	£810.00	£649.00
GALE					
G5 401 Speakers (pr)	£393.70	£339.00	SANSUI		
IMF					
TL5 50 Mk II Spkrs (pr)	£345.00	£229.90	90/90 Receiver ..	£633.35	£399.00
Pro Mon Mk IV Spkrs (pr)	£904.14	£730.00	SONY		
JVC					
JRS 400 Receiver	£410.00	£299.90	TA5650 Amplifier	—	£225.00
JRS 600 Receiver	£518.00	£439.00	ST4950 Tuner ..	—	£125.90
KEF					
Cantata 5pkrs (pr)	£448.88	£319.90	STR 68005D Receiver	—	£269.90
KLARK-TECHNIC					
Graphic Equaliser	£458.00	£369.00	TC138 Cassette Deck	—	£169.95
LEAK					
3900A Amplifier ..	£371.78	£249.00	TC1535D Cass. Deck	—	£163.95
LECSON					
HL 1 Speakers (pr)	£320.60	£249.90	TC2095D Cass. Deck	—	£229.95
5P 1 Speakers (pr)	£433.00	£339.00	TC1775D Cass. Deck	—	£399.00
LENTEK					
Monitor 5pkrs (pr)	£360.00	£299.00	EL5 Elcaset ..	—	£297.00
			EL7 Elcaset ..	—	£449.00
STRATHEARN					
			STM 4/M75ED Turntable ..	£79.95	£68.00
TEAC					
			A33005X Tape Deck	£537.75	£449.00
			A33005X-2T Tape Deck ..	£553.50	£456.00
			A2340X Tape Deck	£640.00	£528.00
			A33405 Tape Deck	£780.75	£645.00
TECHNICS					
			5A5460 Receiver	£349.95	£297.00
			ST9600 Tuner ..	£319.95	£256.00
			SP10 Mk II Turntable	£499.95	£399.00
YAMAHA					
			UC 1 Control Centre	£299.70	£249.90
			C 2 Pre-amp ..	£499.50	£399.90
			B 1 Power amp ..	£1098.90	£879.00
			B 2 Power amp ..	£749.25	£599.50
			CA 800 Mk II Amp.	£279.00	£219.90
			CT 800 Tuner ..	£222.30	£178.00
			CR 1000 Receiver	£549.00	£439.00

Among the brands that we stock are the following:—

Aiwa, Amcron, Ampzilla, AR, Armstrong, Audiomaster, BGW, Celef, Dahlquist, DBX, Direct Designs, Dual, Fidelity Research, Fons, Gale, IMF, J. E. Sugden, JR Loudspeakers, JVC, Keesonic, KEF, Lentek, Lecson, Lux, Monitor Audio, Nakamichi, Orpheus, Phase Linear, Quad, Radford, Ram, Revox, SMC, SME, Sony, Sonus, Spondor, Stanton, Stax, Tangent, Teac, Technics, Thorens, Trio, Yamaha.

KJ Leisure Sound
AN AUDIBLE DIFFERENCE



48, Wigmore Street LONDON W.1. Tel: 01-486 8263

Opening Hours Monday - Saturday 9.30 am - 5.30 pm
Thursday late night until 8pm

HARROGATE ALWAYS FIRST

The exciting new equipment for the Autumn is always unveiled first at

Audio



77

The Northern International Hi-Fidelity Festival

The Harrogate show is an established show at which it has become accepted that all the manufacturers show off their new products before showing them anywhere else.

You really can't afford to miss it.

There's no better place to see all these products than Harrogate the centre of the U.K. accessible by land, sea and air. Each year the list of companies exhibiting reads like the 'Who's Who' of the Hi-Fi and Audio business; each year the show gets bigger and better - and that's been true since 1970.

THE MAJESTIC, CAIRN, AND OLD SWAN HOTELS, HARROGATE.

September 1st, 2nd, 3rd and 4th 1977

Opening Times

Sept 2nd 4 pm - 9 pm
Sept 3rd 11 am - 9 pm
Sept 4th 11 am - 7 pm

IT ALL HAPPENS AT HARROGATE!



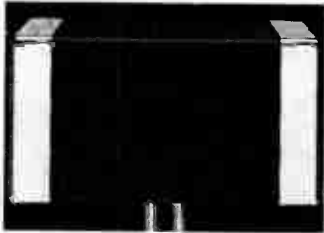
EXHIBITION AND CONFERENCE SERVICES LTD
Claremont House, Victoria Avenue, Harrogate. Tel. 62677

REW

Are proud to announce their new showroom offering a highly specialised and personal service on the leading makes in high fidelity



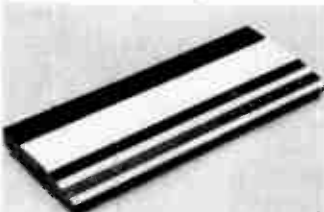
Get away from the bustling crowds. Listen and choose at your leisure from all these top makes: Acoustic Research, Amcron, Bose, Bang & Olufsen, Cambridge Audio, dbx, Decca London, Denton, Dokorder, Fidelity Research, Gale, Harman Kardon, Harrison, JBL, JR, KEF, Lecson, Lenco, Micro-Acoustics, Micro Seiki, Mission Electronics, Nakamichi, Ortofon, Phase Linear, Pioneer, Quad, Revox, Rogers Monitors, SAE, Satin, Sequerra, Shure, Sonus, Sony, Soundcraftsmen, Spendor, Stanton, Stax, Tandberg, Tannoy, Teac, Technics, Transcriptors (Michell Engineering), Uher, Ultimo, Yamaha.



B & O

Gale

The speaker that must be heard. Used in conjunction with high quality ancillary equipment, the Gale GS401 is capable of phenomenal performance with remarkable dynamic range. We also have available from this British company the world's best turntable and a selection of very high quality disc recordings.



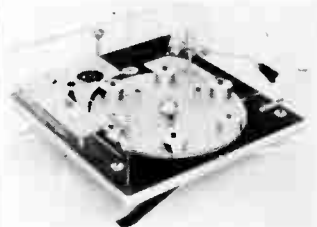
At REW you can compare the chic range of B & O equipment alongside the best of the world's hi-fi. We think you'll be surprised if you've only thought of B & O in terms of design.

SAE



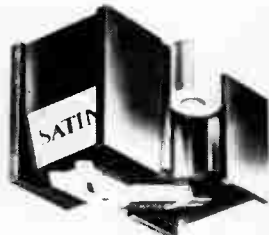
The world's finest audio equipment, combining elegance with excellence. A wide range of SAE amplifiers, pre-amplifiers, equalisers and the incredible Mark 5000 impulse noise reduction system can be seen and heard at REW's VIP Showroom.

Transcriptors



Michell Engineering are still producing the best turntables made in the UK. Unfortunately, as with most good British products, demand far exceeds supply, but we have them in stock now!

Moving Coil PU's



Moving coil pickups offer advantages in terms of transient response and overall quality. We stock models by Denton, Satin, Nakamichi, Ortofon, Ultimo and Fidelity Research.

Lecson



Disproving the growing belief that the British cannot compete with the Japanese in terms of styling and performance, Lecson produce some of the world's best amplifiers. On demonstration at REW.

JBL



Legendary loudspeakers from California. We have several models on demonstration. They are expensive, but worth every penny.

Get The VIP Treatment at

REW

Audio Visual ©

146 Charing Cross Road,
London WC2.

Tel: 01-240 3064/5

EXPORT TO EUROPE OUR SPECIALITY

Mail Order REW House, 10-12 High Street, Colliers Wood, London SW19. Tel: 01-540 9684.

Nakamichi



NAKAMICHI SYSTEM 1 is now on continuous demonstration at REW. This unique concept in audio separates is soon to be supplemented with a new tuner, pre-amplifier and we shall shortly have available the new 400 series amplifiers.

Technics



Technics at REW. Our stocks of Technics are second to none, as is our knowledge of the product. This is a company which is always looking forward with new units available to meet all needs.

Yamaha



Currently the most respected name in popularly priced Japanese hi-fi equipment. We are able to demonstrate and advise on the whole range including the remarkable NS1000 speaker system.

Telephone
888 0077

Goodwins

The hi-fi specialists

MAIL ORDER, EXPORT or CALLERS
Cash or Credit terms

TUES-SAT 9.00 TO 5.30. CLOSED MONDAYS

WE CAN SUPPLY MOST EQUIPMENT
ADVERTISED IN THIS MAGAZINE

EASY TERMS THE EASY WAY — CREDIT BY POST

EXAMPLES OF DEPOSIT AND REPAYMENTS

	<i>Example 1</i>	<i>Example 2</i>
Hi-Fi System price	£136.40	£475.80
20% deposit (rounded off)	£27.40	£95.80
	<hr/>	<hr/>
Balance	£109.00	£380.00
	<hr/>	<hr/>
12 monthly instalments of	£10.96	£37.61
18 monthly instalments of	£7.85	£26.97
24 monthly instalments of	£6.30	£21.65

Service charges involved in the above calculation are equivalent to a maximum annual percentage rate of charge of 36.99% p.a. calculated on the reducing balance

PERSONAL CALLERS DIFFERENT CREDIT TERMS

ALSO INSTANT CREDIT
with 10% deposit
on goods valued over
£100 for credit card
holders.



Just phone in or write in
your card number for
prompt despatch.

AMPLIFIERS

Armstrong 621
Cambridge P80
Lecson AC1, AP1, AP3
Pioneer SA5300
Pioneer SA6300
Pioneer SA7300
Pioneer SA7500
Radford ZD50
Radford ZP250
Sugden A48
Sony TA70, TA88
Sony TA1630, TA2650
Sony TA3650, TA5650
Technics SU7200
Technics SU7600
Technics SU3500
Yamaha CA410, 610
Yamaha CA800, 1000

Linr-Sondek LP12
Mitchell Electronic
Pioneer PL112D, PL115D
Pioneer PL117D, PL510A
Pioneer PL530, PL550
Sony PS1450, PS1700
Sony PS3300, PS4300
Technics SL20, SL23
Technics SL150, SL1700
Technics SL2000, SL110
Transcriptor Ref.
Transcriptor Hydraulic

Sony TC138, TC177
Sony TC186, TC204
Sony TC204, TC206
Tandberg 10XD
Tandberg TCD310, TCD330
Technics RS263, RS630
Technics RS640, RS671

TUNERS

Armstrong 623 & 624
Lecson FM1
Pioneer TX5300, TX7500
Sony ST70, ST88
Sony ST2950F, ST3950 etc.
Sugden T48
Technics ST7200, ST7600
Technics ST3500
Yamaha CT410, CT610
Yamaha CT800, 7000

RECEIVERS

Armstrong 625, 626
B & O Beomaster 901, 1100
B & O Beomaster 1900, 2000
B & O Beomaster 3400, 6000
Pioneer SX450, SX550
Pioneer SX650, SX950
Sony STR7015, 7025
Sony STR4800, STR5800

Technics SA5060, SA5160
Technics SA5460
Tandberg TR2075, TR2055
Tandberg TR2075
Yamaha CR450, CR600
Yamaha CR800, CR1000

SPEAKER SYSTEMS

AR7X, AR16, AR17
B & W DM2A, DM4, DM5
B & W DM6
B & O Beovox S22, S45
B & O Beovox S60, S70
Celestion Dittons 15, 25, 33, 56
Celestion UL6, UL8, UL10
JR 149
KEF 103, 104 AB
KEF Calinca, Cantata
Monitor Audio Speakers
Mordaunt Short Pageants
Pioneer HPM40
Rogers L53/5A
Rogers Export Monitors
Sony Speakers
Technics Speakers
Yamaha NS1000M
Wharfedale Speakers

PICKUP ARMS

Formula 4 Arm
SME 3009/II
SME 3009/52

MUSIC CENTRES

Aiwa 5050, 5080
Beocentre 1600
Beocentre 3600
Hitachi Centres
National SDT1020, 1060
National SDT2030, 2080
National SDJ3090
Sony HMK40A, HMK70
Toshiba SM3200, SM3500

SPEAKER CHASSIS

KEF T27, B110
KEF B200, B139
KEF DN12, 13
Lowther PM6, PM7
Tannoy 10", 12", 15"

OTHERS

Decca Record Brush
Decca Record Cleaner
Watts Parastat
Zerostat etc.

TURNTABLES

Ariston RD11E
B & O Beogram 1100
B & O Beogram 4002
B & O Beogram 6000
Connoisseur BD1, 2 & 3
Dual Turntables
Fons CQ30

TAPE RECORDERS & CASSETTE DECKS

Aiwa AD1250, AD1300
Aiwa AD1600, AD1800
Aiwa AD6300, AD1600
Aiwa AD6300, AD6500
B & O Beocord 1100
B & O Beocord 5000
National RS260
Nakamich DT600
Pioneer CTF2121, CTF6060
Pioneer CTF7070, 9191
Revox A77
Sony TC117, TC118
Sony TC135, TC136

ABOVE IS ONLY A PARTIAL LISTING OF OUR VAST RANGE OF EQUIPMENT



EXPORT INFORMATION. Export prices and shipping quotes free or send \$2 Bills for literature. All equipment carefully packed, insured and SHIPPED PROMPTLY AT MINIMUM COST TO ALL PARTS OF THE WORLD. (All goods supplied free of V.A.T.) Payment may be made in any currency by bank transfer, certified cheque, postal order or money order. Personal export facilities—visitors welcome to showroom.

Goodwins 7 THE BROADWAY,
HIGH ROAD, WOOD GREEN, LONDON N22

To: GOODWINS (Dept. HFN)
7 THE BROADWAY, HIGH ROAD, WOOD GREEN,
LONDON N22

Please supply prices on the following equipment:

.....
.....

I would like to pay Cash/by Cheque/Barclaycard/Access/on credit (Please delete method not applicable)

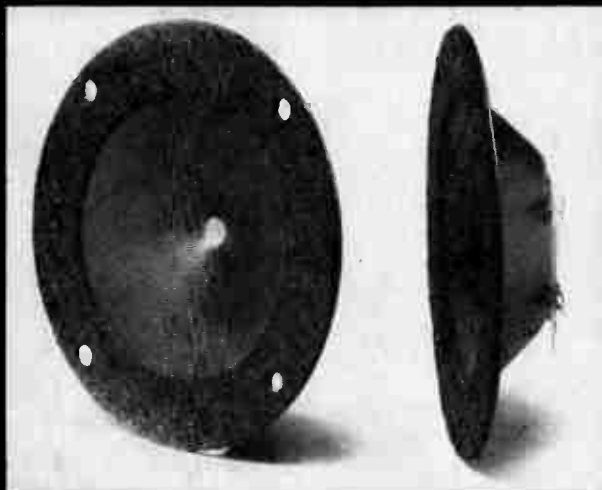
Full Name.....

Address

.....PHFS4

2 DOORS FROM ODEON CINEMA. 3 MINUTES WOOD GREEN TUBE STATION. TEL: 01-888 0077. E. & O.E.

*Just another
tweeter?*



Already discerning Hi-Fi manufacturers have discovered the advantages of incorporating Motorola Piezo Tweeters in their loudspeaker designs.

For your introduction listen to:—
Dayton Wright, Dalquist, Proac.

**SOUNDOUT
SOUNDOUT
SOUNDOUT
SOUNDOUT**

Sole UK importers and distributors
SOUNDOUT PRODUCTIONS LTD
71 MAPLE ROAD, SURBITON,
SURREY, ENGLAND.

TELEPHONE: 01 399 8225/6

If you care for
your records—
one clean
investment
saves many



with the **GRAND PRIX
AWARD WINNING**

Pixall RECORD CLEANER

You're looking at the solution to one of the oldest problems in audio—how to protect your new records and rejuvenate all the old favourites. It's called "Pixall"—and it's remarkable. This unique British cleaner so impressed the Jury at "International Stereo Compo '76" that it was aptly honoured with the Grand Prix Award in its product section.

The key to Pixall's success lies in its specially formulated adhesive tape, designed not merely to remove surface dust but more specifically to lift and dispose of damaging microdust particles, embedded deep inside the grooves.

Independent tests have shown that a disc treated with "Pixall" results visually in leaving the record in pristine condition, whilst audibly it makes sound, sound better. Available at all quality Hi-Fi, Stereo and Record stores.

Sets a New Dimension in Visual and Audible Perfection

- No Dust ● No Dirt ● Reduces Stylus Wear
- Eliminates 'Crackles and Pops' ● Clean Fidelity
- Minimises Distortion

Keeps your good sounds—sounding good



To: **MILTY PRODUCTS LTD.**,
New Mansion House 173/191 Wellington Road South, STOCKPORT, Cheshire
SK1 3UA. Tel: 061-480 8142/3. Telex: 667700
Please supply (state quantity required)

"Pixall" Off-the-Record" Cleaner
£2.97 incl. VAT. P & P add 19p.

I enclose Cheque/P.C. value

"Pixall" Genuine Refill £.55 p
incl. VAT. P & P add 9p.

£ _____
(please do not send postage stamps)

NAME _____

ADDRESS _____

POSTCODE _____

(BLOCK CAPITALS PLEASE)

Prices only applicable to the UK

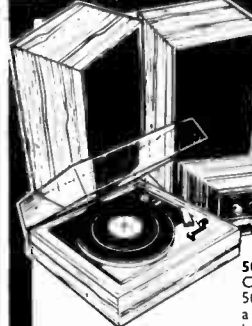


ATTENTION!

Major

audio

cuts the cost of hi-fi



AMSTRAD SYSTEMS

5050 SYSTEM. (illustrated)
Consisting of the Amstrad 5050 stereo receiver, plus a pair of Amstrad 2500 loudspeakers and a Garrard SP25 Mk IV turntable fitted with an Amstrad M95 cartridge, mounted on plinth and cover. All leads included. Ready to play. On permanent demonstration. (Choice of deck or speakers may be changed on application.) MAJOR PRICE £143.95+£6.50 carr. & ins.

8000 SYSTEM. Consisting of the Amstrad 8000 Mk III amplifier, a pair of Amstrad 10 loudspeakers and a Garrard SP25 Mk IV turntable fitted with an Amstrad M95 cartridge, mounted on plinth and cover. All leads included. Ready to play. On permanent demonstration. (Choice of deck or speakers may be changed on application.) MAJOR PRICE £68.95+£4.50 carr. & ins.

Complementing the 2000 and 8000 systems:

AMSTRAD 3000 Mk II MW/LW/FM STEREO TUNER

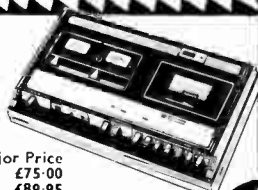
MAJOR PRICE £42.95+£1.75 carr. & ins.



AMSTRAD IN-CAR
(Combination Stereo Cassette/Stereo Radio Players)
Model Major Price
9000 .. £55.00
9050 .. £73.00
9070 .. £80.00

AMSTRAD CASSETTE DECKS with Dolby

Model Major Price
7050 (illus.) .. £75.00
7070 .. £89.95
6000 (non-Dolby) .. £57.00
Please add £2.25 carr. & ins for each



All supplied with a pair of loudspeakers. Please add £1.75 carr. & ins. for each unit ordered

FREE DEMONSTRATIONS WITHOUT OBLIGATION

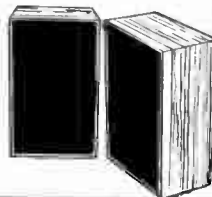
AMSTRAD LOUDSPEAKERS & HEADPHONES



LOUDSPEAKERS—MAJOR PRICE
2500 .. £39.50 per pair
1500 .. £34.00 per pair
+£3.00 carr. & ins.

STEREO HEADPHONES

HPS6A Stereophones with mono/stereo switch and volume controls. MAJOR PRICE £10.50+75p carr. & ins.



Major

audio

Mail Order and Callers Welcome

(Dept. HFN7) 57 Ilford Lane, Ilford, Essex.
Telephone: 01-553 5720

Mail Order and Callers welcome. All prices include VAT at 12½%. Access and Barclaycards welcome. All goods guaranteed for 12 months parts and labour. New items exchanged if faulty within 14 days of purchase.



AMPLIFIERS		Cassette Decks	
Carr. & Ins. £1.95		Carr. & Ins. £2.50	
Akai AA5210 ..	£76.50	Akai C534D ..	£97.95
Amstrad 2000 Mk III ..	£42.95	Akai GX39D ..	£131.95
Amstrad 4000 Mk II ..	£32.40	Akai 705D ..	P.O.A.
Amstrad 8000 Mk III ..	£27.95	Akai 710D ..	P.O.A.
Leak 3900A ..	£269.90	Amstrad 6000 ..	£57.00
Marantz 1030 ..	£78.95	Amstrad 7050 (Dolby) ..	£75.00
Marantz 1060 ..	£124.90	Amstrad 7070 (Dolby) ..	£89.95
Marantz 1070 ..	£167.95		
Marantz 1040 ..	£142.95		
Marantz 1150 ..	£332.90		
Marantz 1150D ..	£418.75		
Pioneer SA5300 ..	P.O.A.		
Pioneer SA6300 ..	P.O.A.		
Rotel RA312 ..	£69.90		
Rotel RA412 ..	£86.00		
Rotel RA712 ..	£106.95		
Rotel RA812 ..	£150.00		
Sansui AU2900 ..	£75.95		
Sansui AU3900 ..	£99.50		
Sansui AU4900 ..	£122.95		
Sansui AU5900 ..	£168.50		
TAPE DECKS		CASSETTE DECKS	
Carr. & Ins. £2.50		Carr. & Ins. £2.50	
Akai 4000DB ..	P.O.A.	Akai C534D ..	£97.95
Akai 4000D5 ..	P.O.A.	Akai GX39D ..	£131.95
TUNERS Carr. & Ins. £1.95		CARTRIDGES C. & Ins. 30p	
Amstrad 3000 Mk II		Amstrad M95 ..	£4.60
AM/FM ..	£42.95	Shure M75EJ/II ..	£11.10
Marantz 104 ..	£99.75	Shure M75ED/II ..	£13.35
Marantz 112 ..	£172.95	Shure M55E ..	£8.75
Marantz T150 ..	£414.50	Shure V15/III ..	£47.90
		SME 9" Fixed Arm ..	£40.90
		SME Headshell ..	£3.95

Special Clearance Offers of Branded Goods always in stock Please phone first

Rotel RT224 ..	£56.95	Marantz 5120 ..	£179.50
Rotel RT324 ..	£78.95	Marantz 5220 ..	£189.90
Rotel RT724 ..	£94.00	Marantz 5420 ..	£244.50
Rotel RT824 ..	£147.95	Pioneer CT4141A ..	P.O.A.
Sansui TU3900 ..	£103.50	Pioneer CT5151 ..	P.O.A.
Sansui TU5900 ..	£149.00	Sansui SC2000/2 ..	P.O.A.
TUNER AMPLIFIERS		Sansui SC3000/2 ..	P.O.A.
Carr. & Ins. £2.50		TURNTABLES	
Akai AA810 ..	£101.50	Carr. & Ins. £2.50	
Akai AA1020 ..	£151.95	Akai AP001 ..	£66.00
Akai AA1030 ..	£172.90	Akai AP003 ..	£94.00
Amstrad 5050 ..	£91.75	Amstrad TP12D ..	£44.95
Marantz 2215B ..	£123.95	Garrard 865B/II ..	£76.00
Marantz 2225 ..	£192.95	Leak 3001 ..	£99.95
Marantz 2235B ..	£273.67	Marantz 6100 ..	£72.95
Marantz 2250B ..	£433.95	Marantz 6200 ..	£128.95
Rotel RX152 ..	£97.95	Marantz 6300 ..	£193.95
Rotel RX202 ..	£108.00	Rotel RP900 ..	£59.00
Rotel RX402 ..	£143.00	Rotel RP1500 ..	£70.00
Rotel RX602 ..	£181.50	Sansui 222 ..	£58.50
Sansui 331 ..	£107.95	COMPACTS	
Sansui 551 ..	£129.95	Carr. & Ins. £4.00	
Sansui 661 ..	£167.94	Amstrad MC20 ..	£170.10
LOUDSPEAKERS		Sanyo 2711 ..	P.O.A.
Carr. & Ins. £2.95 (per pair)		Sanyo 2611 ..	P.O.A.
Amstrad 1500 ..	£34.00	Sanyo G241IKLL ..	P.O.A.
Amstrad 2500 ..	£39.50	Sanyo G2422 ..	P.O.A.
Celestion Ditton 15 ..	£93.25	PORTABLE TVs	
Celestion Ditton 25 ..	£195.75	Teleton T1265 ..	£67.95
Celestion Ditton 33 ..	£144.50	Hitachi F40 ..	£79.95
Celestion Ditton 44 ..	£170.95	Sanyo 14" T408 ..	£78.00
Celestion Ditton 66 ..	£294.90		

BARGAIN CORNER

(Very Limited Stocks)
Slightly marked and scratched units, guaranteed fully working but with cosmetic faults: scratches, marks, dents, etc. Limited number available, phone before visiting us. NO MAIL ORDER ON THESE ITEMS.

BRAND NEW



ALL PRICES INCLUDE 12 1/2% VAT

AMSTRAD MODELS:—	MAJOR PRICE
2000 Mk III Amplifier ..	£35.00
3000 Mk II Stereo Tuner ..	£35.00
8000 Mk III Amplifier ..	£25.00
9000 Car Cassette AM/FM MPX ..	£47.00
9050 Car Cassette AM/FM MPX (Autoreverse) ..	£58.00
7050 Cassette Deck (Dolby) ..	£68.00
7070 Cassette Deck (Dolby) front-loading ..	£79.00
6000 Cassette Deck (without Dolby) ..	£48.00
2500 Loudspeakers (pair) ..	£35.00
1500 Loudspeakers (pair) ..	£31.00
TP12D Turntable ..	£37.00

BD1-The Connoisseur's Budget Choice



BD1 Kit & Completed BD1 Assembly



BD1 with Plinth, Cover & SME Arm.

The Connoisseur BD1 transcription turntable is a precision engineered product designed to provide top grade performance at a moderate cost. Simplicity is the main feature of this unit giving excellent performance and reliability. A slow speed synchronous motor is used and because of its construction the hum field is very low, so that even the most sensitive of pickups can be used, including the Connoisseur SAU2 or the SME 3009 Series II.

Speed change is achieved by a press button unit at the rear of the platform which automatically moves the drive belt from one pulley groove to the other whilst the turntable is turning. The BD1 turntable kit can be assembled by the home constructor within the hour and when completed will give top quality performance. No soldering is required. Complete the unit with a modern BD1 plinth and cover. The plinth is finished in walnut veneer and fitted with spherical, anti-vibration feet. Add to this a strong Acrylic, bronze cover, hinged with 2-position lid stay and you have a first class turntable at a budget price!

Connoisseur

Write for further details to:
A. R. Sugden & Co. (Engineers) Ltd.
 Manufacturers of Connoisseur Sound Equipment, Connoisseur Works, Atlas Mill Road, Brighouse, West Yorkshire HD6 1ES
 Telephone: Brighouse (0484) 712 142, Telex: 517144 Sugden G.
 Telegrams & Cables: Connoisseur Brighouse.

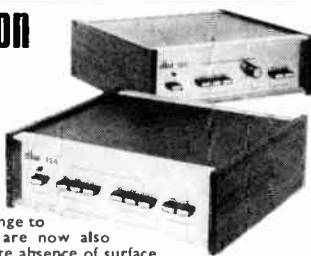
Invite you to
REW IMPROVE YOUR SYSTEM THE PROFESSIONAL WAY



dynamic range dbx enhancers

The DBX 117 and 119 are units that can be added to any system to re-expand the dynamic range that has been lost during the recording process when used with disc, cassette, open reel and FM. They can also be used to compress signals for various purposes including recording constant level background music.
Send for full literature

noise reduction dbx units



The DBX II models 122 and 124 give improvements in noise reduction of up to 30 dB across the whole frequency range when used with tape or cassette (compared with 10 dB for Dolby B). They also enable a far wider dynamic range to be recorded. DBX encoded records are now also becoming available possessing a complete absence of surface noise when decoded with these units.
Send for full literature
DBX PROFESSIONAL ISO SERIES ALSO AVAILABLE

- 146 Charing Cross Road, London WC2. Tel.: 01-240 3064/5.
- 230 Tottenham Court Road, London W1. Tel.: 01-637 2624/5.
- Mail orders to: REW House (Dept HFN), 10-12 High Street, Colliers Wood, London SW19. Tel.: 01-540 9684/5/6.

QUALITY BARGAINS FROM FRANCIS OF STREATHAM

U.K. ORDERS ONLY Add 35p for P/P. Prices subject to alteration without notice. ALL PRICES INC. VAT

	C.60	C.90	C.120
● CASSETTES			
Amplex 2020 Studio...	80p	£1.00	£1.40
B.A.S.F. LH/SM	55p	80p	£1.10
B.A.S.F. Chrome	£1.20	£1.50	£1.95
B.A.S.F. Super LH/SMI	88p	£1.20	£1.60
B.A.S.F. Ferrichrome	£1.50	£1.95	—
E.M.I. X-1000 UD	70p	£1.00	—
Hitachi LN (inc. head cleaning)	60p	90p	£1.10
Hitachi UD	98p	£1.20	£1.45
Memorex MRX2	80p	95p	£1.30
Memorex Chrome	£1.34	£1.94	—
Philips low noise	50p	70p	90p
Philips Super Quality	70p	90p	£1.20
Philips Chrome	£1.15	£1.40	—
Pyral	50p	70p	90p
Pyral Maxima	80p	£1.20	—
Pyral Optima	70p	£1.10	—
Scotch	44p	66p	88p
Scotch Classic	C.45, £1.25	£1.30	£2.00
Sony K	50p	70p	90p
Sony Chrome	£1.40	£2.05	—
Sony HF	90p	£1.25	£1.50
Sony Ferrichrome	£1.85	£2.15	—
TDK Dynamic	60p	90p	£1.10
TDK SD	80p	£1.25	£1.45
TDK SA	£1.50	£1.85	—
TDK Audua	C.45, 95p	£1.25	£1.60
TDK Endless Cassette 3 mins.	£2.10	6 mins.	£2.25
● APPOINTED stockists for PIONEER and J.V.C			
● Head Cleaning Cassettes by Philips or Bib.			
● AMPEX Cassette Cleaner / Demagnetiser, £1.95.			
● TAPE RECORDERS			
Appointed stockists for Tandberg, Sony, Philips, Akai, Hitachi, Revox, Uher, many others. Mics., Mixers, Accessories.			
● HI-FI Amplifiers, speakers, motors, pickups and accessories by leading manufacturers. Complete assemblies.			

PHILIPS OR SCOTCH VIDEO CASSETTES: VC.30, £12.50; VC.45, £16.50; VC.60, £19.50. BASF VC.60, £17.50.

	ST	LP	DP	TP
● AMPEX 2020 3600' on 10 1/2" NAB Metal Spool	£8.00			
● AMPEX TAPES (Polyester) Separately boxed				
7" Pro 1800' 2020 (Ser. 373)	—	£2.95	—	—
7" Series 341, 1800'	—	£1.95	—	—
7" Series 351, 2400' DP	—	—	£2.55	—
7" Series 361, 3600'	—	—	—	£3.05
SHAMROCK TAPES (All Polyester)				
7" 1200'; 1800'; 2400'	£1.00	£1.25	£1.50	—
5" 900' 75p; 1200' £1.20	—	—	—	—
E.M.I. Professional 7" 1800'	—	£2.85	—	—

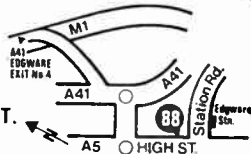
You get a fair deal at a fair price when you buy it from
FRANCIS OF STREATHAM 169-173 HIGH RD., LONDON, SW16 6EG
 Between St Leonard's Church and Streatham Station. Phone: 01-769 0466; 01-769 1092
OPEN ALL DAY SATURDAY—CLOSED ALL DAY WEDNESDAY

PLANET

HI-FI CENTRE

SERVICE Service is our keynote and has been since we were founded in the 1950's. We guarantee to provide parts and labour absolutely free of charge for 12 months on any item purchased from Planet and returned to us as faulty. We only sell goods that we consider to be reliable and backed by reputable manufacturers. All prices quoted are for cash or cheques backed by cheque card. We will be pleased to accept ACCESS or BARCLAYCARD. **SATISFACTION GUARANTEED**

88 HIGH STREET EDGWARE
MIDDLESEX HA8 7HE
TELEPHONE: 01-952 3238
CLOSE TO M1 MOTORWAY
OPEN: 9.30 TO 6 MON. TO SAT.
9.30 TO 12.30 THURS.
EASY PARKING



AMPLIFIERS

Armstrong 621	P.O.A.
Cambridge P80	P.O.A.
Harman/Kardon	P.O.A.
Pioneer SA5500 Mk II	£64.75
Pioneer SA6300	£79.50
Pioneer SA7300	£123.75
Pioneer SA8500	£208.00
Pioneer SA9500	£260.00
Pioneer SA9900	£385.50
Quad 33/303/405	P.O.A.
Rotel RA312	£64.50
Rotel RA412	£85.75
Rotel RA712	£99.00
Rotel RA913	£160.50
Rotel RA1312	£265.50
Rotel RA1412	£349.00
Sansui AU2900/AU3900/AU4900/AU5900/AU7900	P.O.A.
Tandberg TA300M	P.O.A.
Yamaha CA410	P.O.A.
Yamaha CA610	P.O.A.
Yamaha CA810	P.O.A.
Yamaha CA1010	P.O.A.
Yamaha CA2010	P.O.A.

TUNER/AMPLIFIERS

Aiwa 3060A Cass./Receiver	P.O.A.
Aiwa 5050 Music Centre	P.O.A.
Aiwa 5080A Music Centre	P.O.A.
Akai AA1020	£136.00
Akai AA1030	£161.75
Armstrong 625/626	P.O.A.
Goodmans Module 90	£139.75
Goodmans One-Twenty	£154.75
Goodmans One-Fifty	£229.75
Goodmans MCD100 Music Centre	£315.00
Harman/Kardon	P.O.A.
Pioneer 5X450	£113.00
Pioneer 5X550	£140.00
Pioneer 5X650	£199.00
Pioneer 5X750	£239.00
Pioneer 5X850	£310.00
Pioneer 5X950	£350.00
Pioneer 5X1250	£570.00
Rotel RX202 Mk II	£135.00
Rotel RX402	£205.75
Rotel RX603	£257.50
Rotel RX803	£257.50
Rotel RM5010 (Music Centre)	£299.00
Sansui 221/331/551/661/771/881/8080/9090	P.O.A.
Tandberg TR220	P.O.A.
Tandberg TR2025	P.O.A.
Tandberg TR2055	P.O.A.
Tandberg TR2075	P.O.A.
Yamaha CR200E	P.O.A.
Yamaha CR420	P.O.A.
Yamaha CR620	P.O.A.
Yamaha CR820	P.O.A.
Yamaha CR1000	P.O.A.
Yamaha CR1020	P.O.A.
Yamaha CR2020	P.O.A.

TUNERS

Armstrong 623/624	P.O.A.
Cambridge T55 VHF	P.O.A.

Harman/Kardon	P.O.A.
Pioneer TX5300	£73.25
Pioneer TX7500	£143.00
Pioneer TX9500	£175.00
Quad FM3	P.O.A.
Rotel RT324	£78.50
Rotel RT724	£91.00
Sansui TU3900/TU5900/TU7900	P.O.A.
Yamaha CT410	P.O.A.
Yamaha CT610	P.O.A.
Yamaha CT810	P.O.A.
Yamaha CT1010	P.O.A.
Yamaha CT7000	P.O.A.

TURNTABLES

ADC Accutrac 4000	£230.00
Garrard 5P25 Mk 4 Wood Module with Shure M75-6	£37.00
Garrard 1255B Wood Module with Shure M75-6	£49.50
Garrard 865B Mk II Wood Module with Shure M75-6	£69.25
Garrard GT55P Module Shure 75-ED/II	£85.00
Garrard DD75 Module Shure 75-ED/II	£98.50
Harman/Kardon	P.O.A.
Pioneer PL112D	£54.00
Pioneer PL115D	£68.50
Pioneer PL117D	£99.00
Pioneer PL510A	£104.00
Pioneer PL530	£162.50
Pioneer PL550	£193.00
Rotel RP1500	£66.00
Rotel RP3300	£73.50
Rotel RP5300	£95.75
Thorens TD160BC Mk II (less Arm)	£74.00
Thorens TD160C Mk II	£89.50
Thorens TD145 Mk II (Auto Lift)	£113.50
Thorens TD126BC Mk II (less Arm)	£166.00

CARTRIDGES

ADC Q30	£7.00
ADC QLM32	£14.35
ADC QLM36	£18.00
ADC VLM/II in H/Shell	£20.00
ADC XLM/II in H/Shell	£25.00
ADC Super XLM in H/Shell	£38.00
Shure M44-7	£8.00
Shure M55E	£9.75
Shure M75/6	£8.50
Shure M75/EJ2	£15.00
Shure M75/ED2	£17.00
Shure M93/E	£12.00
Shure M95/ED	£21.00
Shure V15/3	£44.00

STYLI

ADC RQ30	£5-85
ADC RQ32	£8.50
ADC RQ36	£9.75
ADC RVL	£13-15
ADC RXL	£15-35

ADC RZL	£19.75
Goldring D120 (G850)	£3.00
Goldring D110 (G800)	£3.50
Shure N44/7	£6.00
Shure N55/E	£7.50
Shure N75/3	£6.00
Shure N75/6	£6.95
Shure N75EJ2	£9.75
Shure N75ED2	£12.75
Shure N93/E	£10.00
Shure N95ED	£17.00
Shure VN35E	£19.50

SPEAKERS Complete

Celestion UL6	P.O.A.
Celestion UL8	P.O.A.
Celestion UL10	P.O.A.
Celestion Ditton 11 (pair)	£57.50
Celestion Ditton 15 (pair)	£92.00
Celestion Ditton 22 (pair)	£115.50
Celestion Ditton 25 (pair)	£195.00
Celestion Ditton 33 (pair)	£143.00
Celestion Ditton 44 (pair)	£169.00
Celestion Ditton 66 (pair)	£280.00
Goodmans RB18 (pair)	£52.50
Goodmans RB20 (pair)	£65.75
Goodmans RB35 (pair)	£94.50
Goodmans Achromat 100 (pr)	£78.50
Goodmans Achromat 250 (pr)	£114.00
Goodmans Achromat 400 (pr)	£154.00
Harbeth H. L. Monitor	P.O.A.
IMF Electronics all models	P.O.A.
Jordan-Watts Janet (pair)	£48.50
Jordan-Watts Juno (pair)	£66.50
Jordan-Watts GT (pair)	£83.50
Jordan-Watts TL5 (pair)	£165.60
KEF Chorale	P.O.A.
KEF Corelli	P.O.A.
KEF Calinda	P.O.A.
KEF Cantata	P.O.A.
KEF Model 103	P.O.A.
KEF Model 104AB	P.O.A.
KEF 104F Stands	P.O.A.
JR149	P.O.A.
Lowther—all models	P.O.A.
Tannoy Eaton (pair)	P.O.A.
Tannoy Devon (pair)	P.O.A.
Tannoy Cheviot (pair)	P.O.A.
Tannoy Berkeley (pair)	P.O.A.
Tannoy Arden (pair)	P.O.A.
Wharfedale Chevin XP (pr)	£29.75
Wharfedale Denton 2XP (pr)	£45.00
Wharfedale Linton 3XP (pr)	£64.50
Wharfedale Glendale 3XP (pr)	£90.75

SPEAKERS Kits & Units

Jordan-Watts Module	£15.50
Jordan-Watts HF Unit	£7.00
KEF DN22 104AB Con Kit	P.O.A.
KEF KK1 Kit (pair)	£63.75
KEF KK2 Kit (pair)	£120.00
KEF T77	£8.75
KEF B110	£11.25
KEF B200	£12.50
KEF B139	£26.00
KEF DN12 (T27/B110/B139)	£6.50
KEF DN13/5 (T27/B200)	£5.25
KEF DN13/7 (T27/B110)	£5.00
Tannoy 295A HPD (pair)	P.O.A.
Tannoy 315A HPD (pair)	P.O.A.
Tannoy 385A HPD (pair)	P.O.A.

TAPE DECKS & RECORDERS

Aiwa AD1250 (Cass. Dolby)	P.O.A.
Aiwa AD1600 (Cass. Dolby)	P.O.A.
Aiwa AD1800 (Cass. Dolby)	P.O.A.
Aiwa AD6300 (Cass. Dolby)	P.O.A.
Aiwa AD6500 (Cass. Dolby)	P.O.A.
Akai 4000DS Mk II (Reel)	£133.75
Akai 4000DB Reel Dolby	£196.75
Akai GX215D (Rev/Reel)	£253.00
Akai C534D Cass. Dolby	£83.00
Akai C5702D (Cass. Dolby)	£94.50
Akai C5705D Cass. Dolby	£122.75
Akai C5707D Cass. Dolby	£157.50
Akai GXC39D Cass. Dolby	£123.00
Akai GXC310D Cass. Dolby	£129.50
Akai GXC710D Cass. Dolby	£173.75
Akai GXC325D Cass. Dolby	£219.50
Akai GXC740D Cass. Dolby	£307.00
Akai GXC760D Cass. Dolby	£345.00
Akai GXC570D (Cass. Dolby)	£407.50
Goodmans 5CD110 (Cass. Dolby)	£124.00
Harman/Kardon	P.O.A.
Nakamichi 250	P.O.A.
Nakamichi 350	P.O.A.
Nakamichi 550	P.O.A.
Nakamichi 600	P.O.A.
Nakamichi 700	P.O.A.
Nakamichi 1000	P.O.A.
Pioneer 2121 Cass. Dolby	£133.00
Pioneer 6050 Cass. Dolby	£170.00
Pioneer 7070 Cass. Dolby	£185.00
Pioneer 8080 Cass. Dolby	£239.50
Pioneer 9191 Cass. Dolby	£283.00
Revox 1102/4 etc.	P.O.A.
Rotel RD12F Cass. Dolby	£145.00
Rotel RD20 Cass. Dolby	£145.00
Rotel RD10F Cass. Dolby	£95.00
Sansui 5C3000/3	P.O.A.
Tandberg 3541X Reel	P.O.A.
Tandberg 10XD Reel Dolby	P.O.A.
Tandberg TCD310 Mk II (Cass. Dolby)	P.O.A.
Tandberg TCD330 Cass. Dolby	P.O.A.
Yamaha TC511 Cass. Dolby	P.O.A.
Yamaha TC800D Cass. Dolby	P.O.A.
Yamaha TC800GL Cass. Dolby	P.O.A.

HEADPHONES

Koss PRO4AA	£35.50
Koss HV1A	£27.50
Koss K6LC	£17.50
Koss K125	£16.00
Koss K135	£19.75
Koss K145	£24.25
Pioneer SE205	£10.30
Pioneer SE255	£15.50
Pioneer SE305	£16.25
Pioneer SE300	£17.30
Pioneer SE500	£24.20
Pioneer SE700	£40.50
Pioneer Monitor 10	£31.80
Yamaha HP3	P.O.A.

PICK-UP ARMS

5ME 3009 Improved	£39.00
5ME 3009 S2 Improved	£43.00
5ME FD Damper	£17.85
Formula 4	P.O.A.

All prices include 12½% VAT Please add £2.75 per item towards carriage and insurance. (Cartridges and styli post 75.). E. & O. E.

DEMONSTRATIONS, EXPERT GUIDANCE AND AFTER-SALES SERVICE

HEARTS

Open 9.15-1, 2-5.30 Mon. to Sat. Shut: 1 Wed. Cheques with £30 cheque cards only accepted for counter sales, with only one cheque per transaction. **Cheques accepted for Mail Orders. BARCLAYCARD, ACCESS CARD** accepted for normal prices. P.O.A.=Price on application Sp. off.=Special offer price for cash P.P.T.B.A.=P & P to be advised **ALL PRICES INCLUDE VAT AT 12½%** All prices are subject to variation without notice

MAIL ORDER SERVICE

● **TAPE RECORDERS (P/P £3-50)**
(B=Dolby B)
Akai 4000DB (Sp. off.) £190.00
Akai 4000DS Mk 2 (Sp. off.) £139.00
Akai GX215 £250.00
Akai GX265D £325.00
Akai GXC630DB B £450.00
Philips N4504 £185.00
Tandberg 3541X, 1521, 1021X, 1041X, 1041XD P.O.A.
Revox A77 Range P.O.A.

● **CASSETTE RECORDERS (P/P £2-00)**
Akai CS34D (Sp. off.) B £92.50
Akai CS702D B £94.00
Akai CS705D (Sp. off.) B £125.00
Akai CS707D (Sp. off.) B £158.00
Akai GXC310D (Sp. off.) B £136.50
Akai GXC325D (Sp. off.) B £235.00
Akai GXC39D (Sp. off.) B £125.00
Akai GXC510D (Sp. off.) B £156.00
Akai GXC570D B P.O.A.
Akai GXC170D B £174.00
Akai GXC740D B £274.00
Akai GXC75D B £148.00
Akai GXC760D B £369.00
Garrard GC300 B £107.00
Garrard GC350 B £132.00
Goodmans SD110 B £128.00
Harman Kardon HK2000 B P.O.A.
Hitachi D800 B £190.00
Hitachi D2560 B £99.50
Hitachi D400 (Sp. off.) B £103.00
Hitachi D450 B £116.00
Hitachi D2310 B £58.50
Hitachi D2330 (Sp. off.) B £75.00
Hitachi D2360 (Sp. off.) B £89.00
Hitachi D2750 B £159.00
Hitachi D3500 (Sp. off.) B £199.00
JVC CD1740 B £85.00
JVC CD1920 B £110.00
JVC KD21 B £115.00

National Technics RS263 AUS £99.00
Neal 102V, 103, 102AV, 103AV, 110 B P.O.A.
Philips N2511 (Sp. off.) B £99.90
Pioneer CTF2121 B £133.00
Pioneer CTF6060 B £170.00
Pioneer CTF7070 B £185.00
Pioneer CTF8080 B £239.50
Pioneer CTF9191 B £283.00
Pye 9145 DNL (Sp. off.) £51.50
Pye 9148A DNL (Sp. off.) £94.50
Rotel RD20 (Sp. off.) B £139.00
Rotel RD10F £112.00
Rotel RD12F (Sp. off.) B £139.00
Sansui SC2000 B £145.00
Sansui SC2002 and case B £145.00
Sansui SC3000/3003 B £180.00
Sharp RT1155H B £105.00
Tandberg TCD330 B P.O.A.
Tandberg TCD310 Mk 2 B P.O.A.
Toshiba PC3110 and Dolby Models PC3060, PC4020, PC4030, PC5060, PC6030 P.O.A.

Metrosound S530 (Sp. off.) 8-track £56.25
● **MICS, ACCESSORIES (P/P 65p)**
Akai ADM20 £8.25
Akai ADM80 £12.00
Akai ACM100 Electret Cardioid £24.00
Akai ACM50 Electret Cardioid £9.60
Beyer M818ML £52.00
Beyer M81LM £22.00
Hacker Stereo Electret pair £15.25
Neal I01 Resolver Mk 2 £17.50
Sansui QSD2 Matrix Decoder P.O.A.
Sennheiser MD722LM and MAZ12 AKG, Calrec £9.90

● **KITS, LOUDSPEAKERS, DRIVE UNITS (P/P on application)**
Celestion HF1300 8 and 15 ohm £7.20
Celestion HF2000 £9.20
Coles 4001G £6.30
Decca London Ribbon Tweeter £27.00
Falcon R50 Type Crossover £8.35
Goodmans Mezro Twin Kit pair £53.00
KEF B110 SP1003 £11.75
KEF B139 SP1044 £26.50
KEF B200 SP1014 £12.50
KEF DN12 SP1004 £7.60
KEF DN13 SP1015 £5.70
KEF DN13 SP1017 £5.70
KEF DN22 (104AB Crossover) £24.00
KEF KK1 Kit pair £63.00
KEF KK3 Kit pair £118.00
KEF T15 £9.03
KEF T27 SP1032 £8.75

Micro Seiki Shock Absorbers P.O.A.
Peerless DT10HFC £9.00
Peerless KO10DT £8.00
Poly Planar P40 pair (add P/P 90p) £10.80
Poly Planar A2000V Car. pr. £11.50
Tannoy HPD29SA 10in. unit pr. P.O.A.
Tannoy HDP315A 12in. unit pr. P.O.A.
Tannoy HPD385A 15in. unit pr. P.O.A.
Wharfedale Denton 2XP kit £22.50
Wharfedale Glendale XP Kit pair £47.00
Wharfedale Linton 2 kit pair (Sp. off.) £22.00
Wharfedale Linton 3XP kit pair £33.50
Zerostat Pistol £6.50

● **TUNERS (P/P £2-00)**
Akai AT2200 £80.00
Alpha FM007 £34.00
Alpha TX500 £46.00
Armstrong 623, 624 P.O.A.
Eagle AAB (Sp. off.) £50.00
Harman Kardon T403 P.O.A.
Hitachi FT300 (Sp. off.) £76.50
JVC JTV31 P.O.A.
National Panasonic ST2300 £63.00
Pioneer TX7500 £143.00
Pioneer TX9500 £198.00
Quad FM3 (for Personal Callers) £10.25
Revox A76 P.O.A.
Rogers Ravensbrook P.O.A.
Rogers T75 (Series 2) P.O.A.
Rotel RT224 (Sp. off.) £52.50
Rotel RT324 (Sp. off.) £76.50
Rotel RT624 £99.00
Rotel RT724 (Sp. off.) £91.00
Rotel RT824 £147.00
Sansui TU3900 £104.50
Toshiba ST220 and ST420 P.O.A.

● **STEREO AMPLIFIERS (P/P £2-00)**
Akai AM2200 (Sp. off.) £79.00
Akai AM2400 £124.00
Alba UA900 P.O.A.
Armstrong 621 Teak or Rosewood P.O.A.
Cambridge Audio P80 silver, black £148.50
Eagle AA4 (Sp. off.) £45.00
Harman Kardon A401 and A402 P.O.A.
Hitachi HA610 £182.00
JVC JAS11 P.O.A.
JVC JAS31 P.O.A.
Leak 3900A £253.00
National Panasonic SU2300 £63.00
Pioneer SA5300 (Sp. off.) £59.00
Pioneer SA6300 £79.00
Pioneer SA7300 £123.00
Pioneer SA7500 £179.00
Quad 303/33 (for Personal Callers) £211.50
Quad 405/33 (for Personal Callers) £264.00
Revox A78 P.O.A.
Rogers Ravensbrook P.O.A.
Rogers A75 (Series 2) P.O.A.
Rotel RA212 (Sp. off.) £54.50
Rotel RA312 (Sp. off.) £64.50
Rotel RA412 (Sp. off.) £83.50
Rotel RA712 (Sp. off.) £96.50
Rotel RA812 £149.00
Rotel RA913 £158.00
Rotel RA1312 (Sp. off.) £260.00
Rotel RA1412 £339.00
Sansui AU2900 (Sp. off.) £65.00
Sansui AU3900 £98.75
Sansui AU4900 £119.50
Toshiba SB220, SB420, SB620, SB820 P.O.A.

● **TUNER-AMPLIFIERS (P/P £2-50)**
Akai AA1010 (Sp. off.) £114.00
Akai AA1020 (Sp. off.) £138.00
Akai AA1030 (Sp. off.) £157.00
Akai AA1050 (Sp. off.) £263.00
Armstrong 625, 626 P.O.A.
Goodmans Module 150 £240.00
Goodmans Module 1-20 £147.50
Goodmans Module 90 £135.00
Harman Kardon HK430, HK730 P.O.A.
Hitachi SR302 £102.00
Hitachi SR502 £122.00
JVC JRS100 P.O.A.
JVC JRS200 P.O.A.
JVC JRS300 P.O.A.
JVC JRS400 P.O.A.
JVC JRS600 P.O.A.
Leak 3200 £153.00
Leak 3400 £194.00
Pioneer SX450 (Sp. off.) £105.00
Pioneer SX550 £140.00
Pioneer SX650 £199.00
Pioneer SX750 £239.00
Pioneer SX850 (P.P.T.B.A.) (Sp. off.) £310.00
Pioneer SX950 (P.P.T.B.A.) (Sp. off.) £350.00
Pioneer SX1250 (P.P.T.B.A.) (Sp. off.) £525.00
Rotel RX102 Mk 1 (Sp. off.) £62.50
Rotel RX102 Mk 2 £83.00
Rotel RX152 Mk 2 (Sp. off.) £92.00
Rotel RX202 Mk 2 (Sp. off.) £99.00
Rotel RX402 (Sp. off.) £135.00
Rotel RX602 £170.00
Rotel RX707 £162.50
Rotel RX802 (P.P.T.B.A.) £237.00
Rotel RX603 £204.00
Rotel RX603 £255.00
Rotel RX1603 (Sp. off.) £487.00
Sansui QRX777 Quadraphonic £499.00
Sansui 331 (Sp. off.) £104.00

Sansui 551 (Sp. off.) £144.50
Sansui 5050 £185.00
Sansui 6060 £222.00
Sansui 7070 £299.00
Sansui 8080 (P.P.T.B.A.) £348.00
Sansui 9090 (P.P.T.B.A.) (Sp. off.) £430.00
Tandberg TR220, TR300, TR2055, TR2075, TR1040P, TR2025 and MB P.O.A.
Toshiba SA220L, SA320L, SA420, SA520 and SA620 P.O.A.

● **STEREO SYSTEMS & PACKAGES (P/P on application)**
Ekco ZU3 (Sp. off.) £81.00
Ekco ZU4L (Sp. off.) £140.00
Ekco ZU5F (Sp. off.) £127.00
Ekco ZU5G (Sp. off.) £141.00
Ekco ZU5J (Sp. off.) £172.00
Ekco ZU5K (Sp. off.) £213.00
Ekco ZU7 (Sp. off.) £172.00
Garrard GA150 £210.00
Koss MC100 (Dolby B) £325.00
Special Offers on Hacker Systems
Hacker CTA700 £234.00
Hacker GAR600 and pair Linton 3XP £218.00
Hacker GAR600 £160.00
Hacker MC600D (Dolby B) £299.00
Hacker MC600D (Dolby B) and pair Linton 3XP £359.00
Hitachi SDT2690R with Dolby B £315.00
Hitachi SDT7620 £190.00
Hitachi SDT7640 £230.00
Hitachi SDT7660 £283.00
Hitachi SDT7675 with Dolby B £337.00
Hitachi SDT7680 with Dolby B £367.00
Hitachi SDT7710 £205.00
JVC I845 excluding speakers £228.00
National Panasonic SG1060L and pair SB107L £185.00
National Panasonic SG2080LD and pair SB61L Dolby B £360.00
National Panasonic SG2080L and SB208 £333.00
National Panasonic SG3060L and pair SB250L Dolby B £297.00
Pioneer M6500 (Sp. off.) £275.00
Rotel RM5010 with Dolby (Sp. off.) £299.00
Sharp SG220 and LS220 £186.50
Sharp SG400 (Dolby B) ext. Skeepers £242.00
Toshiba SM2900, SM3000, SM3100, SM3200 & SM3150 with Dolby B P.O.A.

● **LOUDSPEAKER SYSTEMS**
All prices per pair (P/P on application)
B & W DM2A, DM4, DM5, DM6 P.O.A.
Cambridge Audio R40 (Sp. off.) £193.50
Cambridge Audio R50 (Sp. off.) £253.00
Celestion Ditton 11 £58.50
Celestion Ditton 15 £93.50
Celestion Ditton 22 £118.00
Celestion Ditton 25 £197.50
Celestion Ditton 33 £144.50
Celestion Ditton 44 £170.50
Celestion Ditton 66 £284.50
Celestion Highleigh 2 £39.90
Chartwell LS3/5A P.O.A.
Chartwell PM100, PM200, PM400, PM450 P.O.A.
Goodmans Achromat 100 £73.00
Goodmans Achromat 250 £107.50
Goodmans Achromat 400 £143.00
Goodmans RB18 (Sp. off.) £48.50
Goodmans RB20 (Sp. off.) £63.00
Goodmans RB35 (Sp. off.) £88.00
JR 149 (various finishes to order) P.O.A.
KEF Cantata P.O.A.
KEF Calinda (Sp. off.) P.O.A.
KEF Chorale P.O.A.
KEF Cadenza P.O.A.
KEF Concerto P.O.A.
KEF Coda P.O.A.
KEF Cantor (Sp. off.) P.O.A.
KEF Correlli (Sp. off.) P.O.A.
KEF Reference 103 P.O.A.
KEF Reference 104 with Stands P.O.A.
KEF Reference 104AB with Stands P.O.A.
KEF Reference 105 P.O.A.
Leak 2075 (Sp. off.) £365.00
Leak 3020 (Sp. off.) £79.00
Leak 3030 (Sp. off.) £99.00
Leak 3050 (Sp. off.) £245.00
Leak 3080 £227.00

Monitor Audio MA3 Series 2, MA4, MA5 Series 2, MA7, MA8 P.O.A.
Mordaunt Shoes Carnival Festival, Pageant Series 2 P.O.A.
Philips RH541 Motional Feedback £159.00
Philips RH544 Motional Feedback £251.00
Quad Electrostatic (for Personal Callers) £360.00
Rogers Export Monitor and Stands P.O.A.
Rogers LS3/5A Teak and Walnut P.O.A.
Spendor BC1, BC2, BC3 and Mini Monitor SA1, various finishes P.O.A.
Tannoy Arden, Berkeley, Cheviot, Devon, Eaton, various finishes P.O.A.
Videotone Minimax 2 £44.00
Wharfedale Airedale SP £220.00
Wharfedale Chevin XP (Sp. off.) £29.00
Wharfedale Denton 2XP £41.00
Wharfedale Dovedale SP £137.00
Wharfedale Glendale 3XP (Sp. off.) £79.50

Wharfedale Linton 3XP £58.50
● **STEREO HEADPHONES (P/P 75p)**
Akai ASE11 £12.50
Akai ASE20 (Sp. off.) £11.50
Akai ASE22 £18.50
Beyer DT202 £28.50
Beyer DT204 £60.00
Beyer DT302 (Sp. off.) £8.50
Beyer DT400 £21.00
Beyer DT900-7 £12.50
Goodmans OHP10 £19.50
Hitachi HD60 £13.00
Koss Easylistener £1.50
Koss HV1A £23.75
Koss HV1LC £26.75
Koss HV2 £16.40
Koss K6 £13.00
Koss K6LC £14.75
Koss K7 £9.80
Koss K125 £15.50
Koss K135 £18.90
Koss K145 £23.50
Koss KO747 £20.00
Koss Phase 2 £37.50
Koss Phase 2+2 Quadraphonic £78.50
Koss PRO4AA £31.00
Koss PROSLC £34.25
Koss Technician 2 £34.50
Koss Technician VFR £36.00
Micro Seiki MX1 Electret P.O.A.
Peerless PMB-6 £26.75
Pioneer Monitor 10 £29.00
Pioneer SE205 £9.60
Pioneer SE300 £16.00
Pioneer SE305 £15.00
Pioneer SE500 £22.50
Pioneer SE505 £31.50
Pioneer SE700 £37.50
Pioneer SEQ400 Quadraphonic £23.50
Rotel RH920 Electret (Sp. off.) £25.00
Sansui SS10 £19.50
Sansui SE255 £14.50
Sennheiser HD224X £32.50
Sennheiser HD400 £10.50
Sennheiser HD414X £15.00
Sennheiser HD424X £21.50
Stax SR5/SRD65B Electrostatic £88.75
Stax SR44 Electret £68.50
Wharfedale Isodynamic (Sp. off.) £17.00

● **TURNTABLES (P/P £2-75) AND ARMS (P/P 75p)**
Audio Technica AT1005 Mk 2 £22.50
BSR BDS80 £22.00
BSR BDS95 (Sp. off.) £24.00
BSR MP60 (Sp. off.) £14.50
Garrard 401 £73.00
Garrard SP25 Mk 4 (Sp. off.) £21.00
Lustre arm GST1 £27.00
Reference Fluid Arm £28.00
SME 3009 S/2 Det. Head (Sp. off.) £46.00
SME 3009 Fixed Head (Sp. off.) £39.00
Sugden BDI Chassis £17.75
Sugden BDI Chassis Kit £14.95
Sugden BD2 and SAU2 Chassis £33.50
Sugden BD2A & SAU2 Chassis £39.25
Sugden SAU2 £14.50

● **TURNTABLE PACKAGES (P/P on application)**
ADC Accutrac 4000 (Sp. off.) £230.00
Akai AP001 ex. Cart. (Sp. off.) £66.00
Akai AP003 and AT11 (Sp. off.) £79.50
Akai AP006 (Sp. off.) £120.00
BSR BDS80 Module ex. Cart. £32.00
BSR BDS95 Module ex. cart. £35.00
BSR MP60 Module ex. Cart. £25.00
Dual 1225 and M75E P.O.A.
Fons CQ30 (cut for SME 3009) P.O.A.
Garrard 865B Mk 2 Module and M75-65M (Sp. off.) £58.00
Garrard SP25/4 Module and M75-65 BSR BDS95 Module ex. cart. £36.00
Garrard 1255B Module and M75-65 Garrard 865B Mk 2 Module and M75-65 (Sp. off.) £60.00
Garrard DD75 Module and M75EDT2 (Sp. off.) £87.00
Garrard GT55 Module and M75EDT2 (Sp. off.) £90.00
Goldring GL75P and cover £61.50
Harman Kardon ST7 P.O.A.
Hitachi PS8 and Cart. VFS620 £58.00
Hitachi PS10 and Cart. (Sp. off.) £59.50
Hitachi PS17 and Cart. VFS260 £73.00
Hitachi PS38 Direct Drive and Cart. £86.00
Hitachi PS48 (Sp. off.) £108.00
J.P. T601 P & C and 999REX (Sp. off.) £41.40
JVC JLA15 P.O.A.
JVC JLA45 P.O.A.
Leak 3001 £89.00
Micro Seiki MB10 P.O.A.
Micro Seiki DD20 Direct Drive P.O.A.
Monitor Audio ET1000 P.O.A.
Philips GA222 P.O.A.
Philips GA312 (Sp. off.) £81.00
Philips PL530 £162.50
Pioneer PL550 £193.00
Pioneer PL570 Quartz £255.00
Pioneer PL510A £104.00
Pioneer PL112D £54.00
Pioneer PL115D £68.50
Pioneer PL117D £99.50

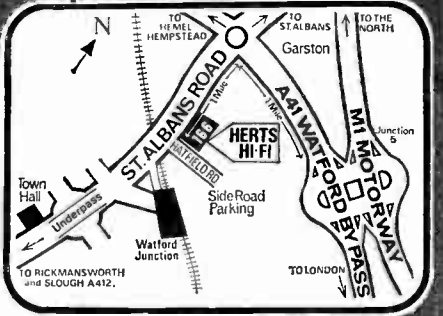
166 St. Albans Road, Watford, WD2 4AS. Tel: Watford 34644

Sound technical advice by qualified staff

BARCLAYCARD ACCESS CARD

You may telephone your order quoting Access or Barclaycard No.

Buy it with Access



SAVE EVEN MORE By Purchasing a Complete System

- Pioneer PL15R £59.50
- Pioneer PL55X Direct Drive £130.00
- Reference Electronic with Arm £183.00
- Reference Electronic excl. Arm £150.00
- Reference Hydraulic excl. Arm £126.00
- Reference Hydraulic with Fluid Arm £156.00
- Reference Prisma P.O.A.
- Model RP900 (Sp. off.) £52.00
- Model RP1500 with Arm (Sp. off.) £64.00
- Model RP2500 £88.00
- Model RP3000 with Arm £115.00
- Model RP3300 £73.00
- Model RP5300 £95.00
- Model SR222P (Sp. off.) £54.50
- Model SR929 Quartz (Sp. off.) £299.00
- Model FR1080P (Sp. off.) £69.95
- Model SR525 Direct Drive £129.00
- Model BD2 P & C and SAU2 £44.25
- Model BD2A P & C and SAU2 £50.00
- Model BD103 P & C and arm £95.00
- Model BD103 P & C excl. arm £89.00
- Model TD125/2AB £146.00
- Model TD126C Mk 2 £208.00
- Model TD145C Mk 2 £114.00
- Model TD160C Mk 2 (Sp. off.) £87.50
- Model TD126BC Mk 2 £166.00
- Model TD160BC Mk 2 (Sp. off.) £71.50
- Model TD160BC and SME 3009 (Sp. off.) fixed head £110.00
- Model SR220, SR255, SR335, SR370 Direct Drive P.O.A.
- CARTRIDGES (P/P 63p)**
- ADC XLM Mk 2 and Shell (Sp. off.) £25.00
- ADC VLM Mk 2 and Shell £21.00
- ADC QLM32 £13.50
- ADC QLM36 £18.50
- ADC Q30 £6.50
- ADC Q32 £8.95
- ADC Q36 £11.00
- Decca Deram Con. L. Blue £5.00
- Decca Deram Ellip. L. Gold £5.00
- Decca London £31.00
- Model 999REX (Sp. off.) £4.50
- Model 2000E (Sp. off.) £8.50
- Model 2000E/2 £13.90
- Model 2000E/3 £14.75
- Model 2000Z £48.50
- Model CS90 £4.50
- Model CS91E £5.80
- Model FS1E £18.00
- Model FF15E £12.00
- Model M15E Super £39.50
- Model VM520E £24.00
- Model MC20 and STM72 £67.00
- Model SL20E and STM72 £61.00
- Model M44E (Sp. off.) £7.60
- Model M55E (Sp. off.) £8.55
- Model M75-65 (Sp. off.) £7.60
- Model M75B Type 2 (Sp. off.) £10.70
- Model M75ED Type 2 £15.75
- Model M75EJ Type 2 £13.30
- Model M95ED £19.95
- Model M95EJ (Sp. off.) £13.80
- Model M95G (Sp. off.) £12.95
- Model V15 Type 3 £48.95
- PORTABLE RADIOS (P/P £1.50)**
- Model RP77 Sovereign 4 £68.00
- Model RP721MB Sovereign Rosewood £74.00
- Model RP22MB Golden Sovereign £81.00
- Model SP80 Portable Stereo £99.00
- Model RP70 Ranger £23.00
- Model RP78 Aviemore £36.00
- Model Radio Cassette RPC1 £92.00
- Model TRK5000 Radio/Cass. £76.00
- Model TRK5030 Radio/Cass. £69.90
- Model R50 P.O.A.
- Model R60 P.O.A.
- Model R60MB P.O.A.
- Model R70 P.O.A.
- Model Rambler P.O.A.
- Model RM20 Mains P.O.A.
- Model RM50 Mains P.O.A.
- VIDEO TAPE AND AUDIO TAPE FOR PHILIPS VCR MACHINES**
- Model VC30 (P/P 65p) £12.00
- Model VC45 (P/P 65p) £15.80
- Model VC60 (P/P 65p) £18.40
- Model VC60, box of 5 (P/P £1) £91.00
- Model VC60, box of 10 (P/P £1.50) £180.00
- Model Agfa, BASF and TDK cassettes P.O.A.

<p>SANSUI AU2900 SYSTEM</p> <p>Sansui AU2900 Amplifier McDonald BDS95 Turntable ADC Magnetic Cartridge Pair Goodmans RB20 Speakers</p> <p>Special Offer £168</p>	<p>SANSUI 331 SYSTEM</p> <p>Sansui 331 Receiver McDonald BDS95 TPD Turntable ADC Magnetic Cartridge Pair Wharfedale Linton 3XP Speakers</p> <p>Special Offer £199</p>	<p>ALBA UA900 SYSTEM</p> <p>Alba UA900 Amplifier McDonald BDS95 Turntable ADC Magnetic Cartridge Pair Goodmans RB35 Speakers</p> <p>Special Offer £199</p>	<p>ROTEL RA312 SYSTEM</p> <p>Rotel RA312 Amplifier Rotel RP1500A Turntable Shure M75ED Cartridge Pair Wharfedale Linton 3XP Speakers</p> <p>Special Offer £207</p>
<p>ROTEL RX152 Mk II SYSTEM</p> <p>Rotel RX152 Mk II Receiver Pioneer PL112D Turntable Shure M75ED Cartridge Pair Linton 3XP Speakers</p> <p>Special Offer £212</p>	<p>ROTEL RX202 SYSTEM</p> <p>Rotel RX202 Receiver Garrard 125SB Turntable Shure M75-65M Cartridge Pair Goodmans RB20 Speakers</p> <p>Special Offer £215</p>	<p>HITACHI SR302 SYSTEM</p> <p>Hitachi SR302 Receiver Hitachi PS17 Turntable Hitachi UFS260 Cartridge Pair Wharfedale Denton 2XP Speakers</p> <p>Special Offer £215</p>	<p>AKAI AA1010 SYSTEM</p> <p>Akai AA1010 Receiver Sansui SR222P Turntable Shure M75ED Cartridge Pair Wharfedale Denton XP Speakers</p> <p>Special Offer £229</p>
<p>PIONEER SX450 SYSTEM</p> <p>Pioneer SX450 Receiver Pioneer PL112D Turntable Shure M75ED Cartridge Pair Wharfedale Linton 3XP Speakers</p> <p>Special Offer £238</p>	<p>ROTEL RA412 SYSTEM*</p> <p>Rotel RA412 Amplifier Rotel RP1500 Turntable Shure M95ED Cartridge Pair Wharfedale Glendale 3XP Speakers</p> <p>Special Offer £240</p>	<p>ROTEL RA712 SYSTEM*</p> <p>Rotel RA712 Amplifier Rotel RP1500 Turntable Shure M95ED Cartridge Pair Wharfedale Glendale 3XP Speakers</p> <p>Special Offer £248</p>	<p>HITACHI SR502 SYSTEM</p> <p>Hitachi SR502 Receiver Hitachi P38 Turntable Hitachi VFS260 Cartridge Pair Wharfedale Linton 3XP Speakers</p> <p>Special Offer £250</p>
<p>PIONEER SX550 SYSTEM</p> <p>Pioneer SX550 Receiver Pioneer PL112D Turntable Shure M75ED Cartridge Pair Wharfedale Linton 3XP Speakers</p> <p>Special Offer £265</p>	<p>AKAI AA1020 SYSTEM</p> <p>Akai AA1020 Receiver Sansui SR222P Turntable Shure M75ED Cartridge Pair Wharfedale Linton 3XP Speakers</p> <p>Special Offer £265</p>	<p>TOSHIBA SA420 SYSTEM</p> <p>Toshiba SA420 Receiver Toshiba SR220 Turntable Shure M75ED Cartridge Pair KEF Chorale Speakers</p> <p>Special Offer £295</p>	<p>ROTEL RX402 SYSTEM*</p> <p>Rotel RX402 Receiver Rotel RP1500 Turntable Shure M75ED Cartridge Pair Wharfedale Glendale 3XP Speakers</p> <p>Special Offer £302</p>
<p>PIONEER SX550 SYSTEM</p> <p>Pioneer SX550 Receiver Pioneer PL115D Turntable Shure M95EJ Cartridge Pair Celestion Ditton 15 Speakers</p> <p>Special Offer £305</p>	<p>AKAI AA1030 SYSTEM</p> <p>Akai AA1030 Receiver Sansui SR222P Turntable Shure M75ED Cartridge Pair Wharfedale Glendale 3XP Speakers</p> <p>Special Offer £310</p>	<p>LEAK 3200 SYSTEM</p> <p>Leak 3200 Receiver Leak 3001 Turntable Shure M75ED Cartridge Pair Leak 3020 Speakers</p> <p>Special Offer £330</p>	<p>SANSUI 5050 SYSTEM</p> <p>Sansui 5050 Receiver Sansui SR222P Turntable Shure M95ED Cartridge Pair Mordaunt Short Pageant 2 Speakers</p> <p>Special Offer £355</p>
<p>ARMSTRONG 626 SYSTEM</p> <p>Armstrong 626 Receiver Garrard DD75 Module Turntable Shure M75ED Cartridge Pair KEF Cadenza Speakers</p> <p>Special Offer £380</p>	<p>LEAK 3400 SYSTEM</p> <p>Leak 3400 Receiver Leak 3001 Turntable Shure M75ED Cartridge Pair Leak 3030 Speakers</p> <p>Special Offer £390</p>	<p>PIONEER SX650 SYSTEM</p> <p>Pioneer SX650 Receiver Pioneer PL510A Turntable Shure M95ED Cartridge Pair KEF Cadenza Speakers</p> <p>Special Offer £428</p>	<p>HARMAN KARDON 430 SYSTEM</p> <p>Harman Kardon 430 Receiver Micro Seiki MB10 Turntable Ortolon VM5 20E Cartridge Pair Tannoy Devon Speakers</p> <p>Special Offer £468</p>

* Alternative Package: Garrard DD75 Module with M75ED Cartridge.

ALL PRICES INCLUDE VAT AT 12½% EFFICIENT MAIL ORDER SERVICE

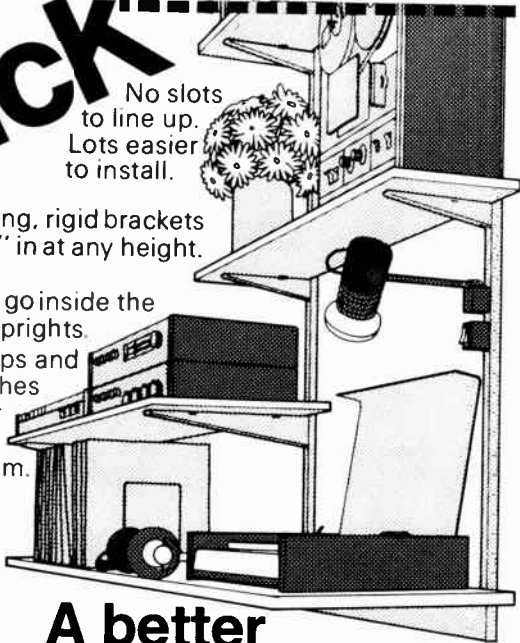
click

No slots
to line up.
Lots easier
to install.

Strong, rigid brackets
"Click" in at any height.

Cables go inside the
uprights.

Lamps and
switches
wherever
you
need them.



**A better
shelving system.**

HFN

Buy Click at Habitat*. Or post this ad with your name
and address for our new FREE colour leaflet.

Click Systems Ltd.,

Low Moor Road, Kirkby-in-Ashfield, Notts NG17 7LH

*and other stockists - list with leaflet. In Eire, from Stock shops.

Bang & Olufsen

wish to appoint a

Retail Consultant

residing in the London Area

c. £4000 p.a.

The successful applicant will be aged between 25-35 years with a record of successful salesmanship and administration within the higher quality segment of the radio, TV and Hi Fi retail trade.

He or she will be responsible for establishing and maintaining a sales consultancy by rotation in a small number of leading stores where the task calls for a self motivating and well presented individual, possessing both integrity and tenacity.

Terms and conditions of employment are excellent.

Applicants please write or telephone Doreen MacDonald, Bang & Olufsen UK Limited, Eastbrook Road, Gloucester. Tel. No. 0452 21591



CLASSIFIED ADVERTISEMENTS ORDER FORM

Please use this coupon for your private sales and wants. Rates: Trade 15p (minimum £2.40); Private 12p per word (minimum £3.00); Box Nos. 35p extra. To: *Hi-Fi News & Record Review*, Classified Advertisements Dept., Link House, Dingwall Avenue, Croydon, CR9 2TA. Please publish the advertisement indicated below for insertion/s under the heading.....

Name

Address

.....

Cheque/P.O. enclosed £

Is a Box No. required Yes/No. if no, please include remittance to cover name and address and/or Tel. No.

Please write in block capitals.

CLASSIFIED ADVERTISEMENTS

Advertisements for this section must be pre-paid. The rate is 12p per word (private), minimum £3.00. Box Nos. 35p extra. Trade rates 15p per word, minimum £2.40. Copy and remittance for advertisements in **AUGUST** issue must reach these offices by **1st JULY** addressed to: The Advertisement Manager, Hi-Fi News & Record Review, Link House, Dingwall Avenue, Croydon CR9 2TA. **NOTE:** Advertisement copy must be clearly printed in block capitals or typewritten.

Replies to Box Nos. should be addressed to the Advertisement Manager, Hi-Fi News & Record Review, Link House, Dingwall Avenue, Croydon CR9 2TA, and the Box No. quoted on the outside of the envelope. The district after Box No. indicates its locality.

Sex Discrimination Act 1975. No job advertisement which indicates or can reasonably be understood as indicating an intention to discriminate on grounds of sex (e.g. by inviting applications only from males or only from females) may be accepted, unless

- (1) the job is for the purpose of a private householder or
 - (2) it is in a business employing less than six persons or
 - (3) it is otherwise excepted from the requirements of the Sex Discrimination Act
- A statement must be made at the time the advertisement is placed saying which of the exceptions in the Act is considered to apply.

FOR SALE—private

Why buy used equipment? Our new prices are often as low. All American, German and many Japanese brands exported world-wide at unbelievable savings. The Sound Affair, 364 Mission Court, St. Louis, MO 63130, U.S.A. X.

Gale or Lentek Loudspeakers on demonstration. Why only these two? Because frankly anything else is inferior or overpriced. Ring "Subjective Audio" for a biased view! 01-886 7289. Thank you. G.

James Moir is replacing a large number of instruments in his laboratory and has the existing equipment for sale. These include a Bruel & Kjaer 2305 level recorder, B & K 2107 analyser, Marconi 4550 harmonic analyser, Marconi TF 144G signal generator, Marconi TF 2604 HF voltmeter, Marconi wide range audio signal generator, Advance Type 5663E signal generator, Advance sound level meter plus octave band analyser, Dawe variable bandwidth filters, Dawe 1461 analyser. All these instruments are in good working order. Offers to 16 Wayside, Chipperfield, Herts. Tel.: Kings Langley 62955. G.

Monitor Audio MA3 Series Two, with stands, 4 months old, £285. Tel.: Darwen (Lancs.) 71173. G.

Yamaha CR1000 receiver as new, offers around £325 invited, SME 3009/II fixed head pickup arm offers. Wanted Ariston RD/II, Thorens TD150 Turntables, both without arm, chassis only considered. Also Stax UA7 pickup arm required. Tel.: Dave Ritchie on 01-686 2599. Ext. 304, days.; Farnborough (Kent) 59438, evenings. G.

Marantz 115B stereo tuner as new, £98. Cambridge P110 amp, as new, £125. Goldring G900SE, £28. A.D.C. XLM, £15. Both little used. Tel.: Snowden (0262) 78802. G.

Revox, Teac, Quad: selling privately—A77 Mk 2 2TR new heads, £225; 3340, £500; 33, £65; two 303's, £65 each. Tel.: evenings, Kelly 073581-518 (nr. Maidenhead, Berks.). G.

Quad 33/405 Current Dumping Amp and Pre-Amp, £200; Nakamichi 600 Cassette deck, £235; Jim Rogers JR149 Speakers (rosewood tops), £100 pair; Linn Sondek LP 12 Turntable/Grace G707 Arm/Stanton 681 EEE, £200; Stax Electret 'Phones, £50. All hardly used and perfect mint condition. Suitable offers accepted. Tel.: Doncaster 743517. G.

Pair Celestion Ditton 66 Speakers, "immaculate", £195. Tel.: Ninfeld 892451; STD code, 0424, nr. Bexhill, Sussex. G.

Ultimate reproduction for sale. Linn Sondek LP12, Grace G707, Supex 900E, Naim Nac 12/NAP160, Linn Isobarik Monitors, cost £1500 new, perfect, £1100, will deliver. Tel.: 01-422 1657. G.

Quad F401, CDR plinth, as new, £65. Woodsleeve for Quad FM3 and 33 new, £14. Tel.: Darford 70957. G.

B & O rosewood 6000 System in mint condition. Beomaster 6000 Amplifier plus remote control, £500. Beogram 6000 Turntable, brand new and unused, £385. Two pairs M70 speakers plus stands, £275 per pair. Tel.: Edinburgh 031-334 0022 evenings. G.

Quantity of E.M.I. cone tweeters, £3.50 pair, new in original packing. Tel.: Wendover (Bucks.), 623506. G.

KEF 104AB crossover conversion kits, boxed, new, unused. Offers over £30. M. Lewis, 25 Periwinkle Close, Sittingbourne, Kent. G.

Quad ELS pair (black grille). Mint condition, £185. Buyer collects. Tel.: Burnley (0282) 35306 after 5 pm. G.

Marantz 4230 Receiver, mint condition, walnut case, 30 W (stereo), 12 W (quad) per channel; Dolby system; £185 o.n.o. Shure V15/III, unused, £35 o.n.o. Sell both, £210. Tel.: Stoke-on-Trent 622947, evenings and weekends. G.

Mint condition phase linear 4000. Autocorrelation pre-amp and dynamic range expander together this system makes ordinary records sound like studio master tape, absolutely remarkable sound for the connoisseur. Price £1180. Sell for £700, only six months old. Lee, 53 Rupert Street, London W1. Tel.: 734-3825. G.

Phase Linear 4000/400 pre- and power amp, cost £1157, sell for £800 o.n.o.; also Nakamichi DT600, Fons/S.M.E./V15 Mk III with new replacement styli, Bose 901/II, all mint condition. Further details and demonstration, Tel.: 01-980 7683. Steves the name. G.

Yamaha TB700 Dolby Cassette Deck, many refinements as new, £99. John Davis, Tel.: Newton Abbot 66903. G.

Pioneer SA-800 Amplifier and matching TX-800 Tuner. Immaculate condition, £180. Pair Koss Quadro headphones, £15. Tel.: Bedford 768249. G.

Neal 103 Transcription cassette recorder and tapes, £170 Scott, 43 Halifax Street, Blackpool. Tel.: 62374 evenings. G.

Shure 95ED, £14. Few hours use only. Jones, 113 Ravenscroft Road, Willenhall, West Midlands. G.

American Heath AJ 1510 (professionally built) Digital Tuner. Station selection by keyboard, punched card, automatic spectrum scan 88-108 mHz. Digital frequency display. (Cost £480 April), £200. Ortofon SL15E Mk II M.C. Cartridge/matching module, as new, £25. Tel.: 0923-39423 (Leics.), or Box No. 2541 c/o Hi-Fi News. G.

Transcriptors Saturn II, £50. ADC XLM, £13. Shure M95ED, new, £15. Pair B200/HF1300/T27 in 2cu. ft. TLS 43 x 12 x 10 in., £70 pair. Ormiston, 32 Park View Avenue, Leeds LS4 2LH. G.

Koss PRO 4AA Headphones. Perfect condition, £25 o.n.o. Tel.: Orpington 28783 (evenings and weekends). G.

Tannoy Gold HILLZ Teak, £85 pair. One Tannoy red 15" Lancaster teak, £85. AKG D900E Gun Microphone, £45. Tel.: Luton (0582) 415938 evenings. G.

Teac A3300/II superb condition. Ten scotch tapes 10 1/2" NAB centres. Teac AN80 unused, £300. Will demonstrate. Tel.: South Benfleet (Essex) 57739. G.

Audio Accessories!

There are now two shops in Tottenham Court Road specialising in Audio Accessories.

No more searching, ringing or writing to manufacturers, wholesalers etc. Get it all over the counter, whether building your own or merely finding replacements.

- Over 1200 Audio Accessory lines
- All merchandise fully guaranteed
- All prices include VAT and are correct at time of going to press. E. & O.E.
- Shop hours: Mon. to Sat. 9-6; Thurs. 9-7.
- Access/Barclay. Simply phone order and quote card number for return delivery.
- Fast mail order service.
- Callers welcome.



STYLI (ORIGINAL)		Philips GP400 £6 37	
<i>Original manufacturers</i>		Philips GP401	£8 84
Goldring G800	£3 38	Philips GP412VE	£15 76
Goldring G800E	£6 47	Philips GP422	£26 78
Goldring G800SE	£9 00	Pickering D1200	£25 87
Goldring G800H	£3 38	Pickering D750	£23 62
Goldring G850	£3 04	Pickering D400	£20 81
Goldring G820	£3 38	Pickering D140	£15 75
Goldring G820E	£8 43	Pickering D350	£16 87
Goldring G820SE	£13 50	Pickering D150	£14 06
Goldring G900SE	£15 27	Pickering D100	£12 37
Shure N3D	£4 45	Pickering DIV AME	£19 12
Shure N44E	£6 40	Pickering DIV AM	£13 50
Shure N44/3 78	£5 94	Pickering DIV ACE	£11 81
Shure N55E	£7 55	Pickering DIV AC	£10 12
Shure N75B	£7 25		
Shure N75/6	£6 95	STYLI (REPLACEMENT)	
Shure N75E/II	£9 50	<i>Not original manufacturers</i>	
Shure N75ED/II	£13 40	Goldring G800	£2 16
Shure N75/3 78	£7 63	Goldring G800H	£2 16
Shure N91ED	£15 54	Goldring G800E	£4 46
Shure N93E	£13 11	Goldring G850	£2 16
Shure N91GD	£13 05	Goldring G800/78	£2 43
Shure N95J	£10 60	Philips GP400	£4 05
Shure N95D	£18 19	Philips GP407	£4 05
Shure N95/3 78	£7 87	Philips GP401E	£5 31
Shure VN15E	£18 00	Philips GP412	£7 50
Shure VN35E	£20 00	Philips GP200LP/LP	£1 75
Shure VN78E	£19 25	Philips GP300LP/LP	£1 75
Audio Tech. ATN15	£22 39	Philips GP205LP	£1 45
Audio Tech. ATN20	£27 05	Pickering V15AC	£3 84
Audio Tech. ATN14	£18 69	Pickering V15AT	£3 84
Aud. Tech. AT5125	£15 58	Pickering V15AM	£3 84
Ortofon D15E Super	£24 51		
Ortofon N15E	£12 26	CARTRIDGES	
Ortofon NF15E	£9 19	ADC/Empire range	POA
Ortofon D20E	£21 01	Shure M44E	£8 10
National EPS045TSD	£3 32	Shure M55E	£9 10
National EPS13TSTD	£3 60	Shure M75B	£10 95
National EPS31TSTD	£6 75	Shure N75E/II	£14 25
National EPS345TSD	£6 75	Shure N75ED/II	£15 95
National EPS355TSD	£6 75	Shure N95E/II	£14 75
National EPS365TSD	£3 38	Shure M95ED	£21 40
National EPS145TSD	£3 32	Shure M75/65	£8 55
National EPS255TSD	£2 53	Shure M91ED	£17 70
National EPS175TSD	£3 65	Shure V15/III	£49 95
National EPS450	£20 38	Shure M24H	£28 12
National EPS451QD	£10 46	Decca London	£40 27
Empire 999REX	£4 95	Goldring G800	£4 50
Sony ND128P	£2 25	Goldring G800H	£4 50
Sony ND133G	£7 72	Goldring G800E	£7 20
Sony ND150	£7 24	Goldring G850	£3 75
Sony ND132G	£7 24	Ortofon MC20	£58 22
Sony ND134G	£8 36	Ortofon SL120Q	£75 56
Sony ND114P	£5 63	Ortofon SL20E	£50 67
Sony ND127P	£2 54	Ortofon M15E Super	£48 44
Sony ND100G	£7 40	Ortofon VM520E	£29 33
Stanton DS107A	£10 96	Ortofon 5TM72	
Stanton DS100E	£14 34	Transformer	£20 13
Stanton DS100EE	£17 49	Ortofon F15E	£20 41
Stanton D6800E	£21 31	Ortofon FF15E	£13 78
Stanton D6800EE	£24 60	Philips G.P. 412 VE/1	£32 47
Stanton D6800EEE	£27 84	Philips G.P. 401 MkII	£17 18

WE ALSO SPECIALISE IN ELECTRICAL COMPONENTS—

Diodes, Transistors, LEDs, Thyristors, etc.

STYLUS NO.	QTY.	PRICE—Add Post (Styl. 15p Cartridge-40p)

NAME
 ADDRESS

HI-FI CARE (RETAIL) LTD
 (Dept. HFN/7)
 7 & 245 Tottenham Court Road, London W.1.
 Phone: 01-637 0371/8911 Mail Order Dept:
 01-580 7592/4532

Quick Quiz

Just a tick, that's all it will take you.

- | | Yes | No |
|---|--------------------------|--------------------------|
| 1. Can you fault find Electronic Circuits ? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Do you know how to use an Oscilloscope ? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Are you able to read circuit diagrams ? | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Can you use a Spectrum Analyser ? | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Do you understand the meaning of GHz ? | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Does V.S.W.R. mean anything to you ? | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Do you know how many "ohms" in a village ? | <input type="checkbox"/> | <input type="checkbox"/> |

If you score five or more "Yes" answers, then you could qualify for a really interesting career as a Test Technician with Marconi-Elliott Avionic Systems.

In our Mobile Radar Division at Borehamwood in Hertfordshire we're looking for men and women with a good basic electronics background to join teams working on the development, test and manufacture of a wide range of radar equipment and electronic surveillance and alarm systems.

MARCONI ELLIOTT AVIONICS

A GEC-Marconi Electronics Company

It's challenging work and our Laboratories employ the most advanced techniques. Your experience, plus some training from us, will enable you to enjoy a satisfying future with a top company in the field of electronics development.

If you would like more details, get in touch now with G. Cock at Marconi-Elliott Avionic Systems Limited, Elstree Way, Borehamwood, Herts. Tel: 01-953 2030, Ext.3195.

SITUATIONS VACANT—Cont.

Contractor/Instrument Maker required to produce 1,000 unipivot pick-up arms monthly. Box No. 2537 Middlesex, c/o *Hi-Fi News*. H.

FOR SALE PRIVATE—Cont.

Two KEF T.27 speakers. Two Cole 4001K for State of the Art. Two Peerless K010DT and two Coles 4001G for Daline. All £4 each. Little used. Baker, 28 Ratton Drive, Eastborne. Tel.: 53507. G.

Cambridge Audio P50, £70. Garrard 401+SME 3009 +Shure M75ED in Howland West plinth, £100. Sony TC146B Cassette, £45. Pair Kef Cadenzas, £110. ADC 10E Mk IV Cartridge, £15. Groovac, £12; or £320 complete. Tel.: 43163 Cambridge, evenings. G.

Radford STA 25/3 + SC 22; ISTA 60 + SC 22. Sensible offers only please box No. 2543.

BGW 202 pre-amp, as new, £380. Also Teac AM180 Dolby unit, £75. Tel.: 061-224 6630 (Manchester). G.

BUILD A HIGH QUALITY TRANSMISSION LINE SPEAKER

THE PRO 9TL is a do-it-yourself design by Chris Rogers equal in performance to the best commercial models.

The original magazine article is now out of print. To meet increasing demand for this popular design we have prepared a constructional booklet with full working drawings and data.

This is NOT just a magazine article reprint. Specially prepared by the designer, it contains detail and drawings not published in the original article.

50 pence **POST FREE**

Overseas **£1.25 POST FREE AIRMAIL**
Badger Sound Services Limited,
38A St Andrews Road South,
Lytham St Annes,
Lancs. FY8 1PS.

MONITOR QUALITY LOUDSPEAKERS AT BUDGET SYSTEM PRICES

Is inflation cramping your style? NAS No Compromise Self Assembly Loudspeaker Systems can be completed in less than an evening and the savings are dramatic; typically at least 30% when compared with actual High Street prices of comparable products.

Cabinets are despatched fully finished and complete down to the last nut and bolt and are available with or without Drive Units and High Power Custom designed Crossovers.

NAS 300 MONITOR SYSTEM

A superb floor standing TEB System with 60 Watt power handling and very low colouration 35 Hz to 20,000 Hz. Low resonance 8" Bextrene Unit and Cambric/Butyl Tweeter. Size 22" x 12" x 10" TEAK/WALNUT. Only £99 per pair complete, inc. VAT. Cabinets only, P.O.A.

NEW

NAS 140 HIGH POWER BOOKSHELF MONITOR

A remarkable shelf mounting 2-way Resistive Port System with 50 Watt Power Handling in size only 16" x 9.5" x 8.75" 45 Hz to 20,000 Hz. 8" Bextrene Bass/Mid + Cambric/Butyl Dome Tweeter. WALNUT. Only £85 per pair complete inc. VAT. Cabinets only, P.O.A. Perfect for the new BBC 4-Channel Broadcasts.

PLUS

"THE STATE OF THE ART LOUDSPEAKER" SERIES II. EXPORT SPECIFICATION

(See *Hi-Fi News*, April 1976 issue)
A superb 5-way, 100 Watt Transmission Line System in the "Super-Fi" Bracket. Cabinets only, or complete sets of components.

SPECIAL PERSONAL EXPORT SERVICE

Details/Prices: UK 10p stamp; OVERSEAS: Dollar Bill

NICHOLLS AUDIO SYSTEMS LTD.
33 THE OVAL, TICKHILL, DONCASTER,
SOUTH YORKSHIRE DN11 9HF.
Telephone: 0302-743517

FOR SALE—trade

A.D. Period Hi-Fi cabinets are individually made to your requirements. Send rough sketch of cabinet you have in mind, with your phone number. We will quote a price if we are able to help, or visit our workshop. Village Workshop, 14a Vicars Road, London NW5 4NL. Tel.: 01-267 8504. X.

All American, German and many Japanese brands exported worldwide. Very competitive prices. Specific enquiries, write please. The Sound Affair, 364 Mission Court, St Louis, Mo. 63130, U.S.A. X.

Binaural Recordings. Listen on stereo headphones to 'An Audio Adventure' the first cassette ever produced to demonstrate this exciting development. £3.25 from Mind-power Records (HN), 3 Canonfield, Welwyn, Herts. AL6 0QB. G.

Lindsley-Hood 75 watt amplifiers constructed, repaired and rebuilt. Interference suppression kit, £1.50 inclusive. S.A.E. for list of spares. I. G. Bowman (Dept. H.F.N.), 59 Fowey Avenue, Torquay, S. Devon. X.

Neal 103 Dolby Cassette Deck, £225.50. Ben Radford 180 Monitors, £285 S/S. S.M.C. AS 40, £160. Tannoy Eatons S/S, £215. Omal TL6 S/S, £266. Marantz 4140 Stereo Quadrapower Amplifier S/H, £180. Scott T33-S Digital Tuner S/S, £320. Harman/Kardon ST7 S/S, £290. Harman/Kardon 730 Receiver, £256. Harman/Kardon HK2000 Dolby Cassette Deck, £200. Luxman 800 Receiver S/S, £265. Audio Corner, 117 Portland Street, Southport. Tel.: 0704 37332. G.

KEF Speaker Units, B110, £10.25. B200, £11.75. B139, £23.95. T27, £8.25. Also Crossovers (+ Tax 12%). J. Linsley Hood Amplifiers and Hi Fi test instruments. Supplied from stock. S.A.E. for details. Teleradio Hi Fi, 325 Fore Street, London N9. Tel.: 01-807 3719. X.

10.7 MHz wobblulator kit; 111 mm x 57 mm p.c.b.: R's: C's: i.e.; transistors; skts. You supply case, battery, etc. Features sawtooth generator. Can be altered to other (lower) frequencies. £12.96 inc. VAT (8% rate) and post and packing. Dovedale Electronics Ltd., Post Office Box 47, Derby DE1 2BE. Tel.: Derby (0332) 40717. G.

Allison room-matched loudspeaker systems are not yet distributed in the U.K. Nevertheless, we will be pleased to send our new catalogue by air mail to anyone interested in the descriptions and performance specifications. Write to Allison Acoustics, 7 Tech Circle, Natick, Massachusetts 01760 (U.S.A.). M.

Cerwin-Vega-McIntosh SALES and SERVICE

UPL, Compton House,
35 High Street,
New Malden, Surrey.
Tel. 01-942 9567

MUSEUMS AND EXHIBITIONS

The Musical Museum. Automatic instruments—50 tons of them. Demonstrated 14.00 to 17.00 Saturdays and Sundays, April to October inclusive. By the giant gas holder, west of Kew Bridge. K.

SERVICING

R. Beaumont, specialist audio repairs and Philips VCR service. 21 Southway, Ilkley, West Yorkshire. Tel.: 094-33 2026. X.

Hi-Fi cassette-tape recorders. Repairs by expert engineers. NuSound. See advertisement on page 6. X.

Guaranteed quality speaker repairs. Contact Johnson & Jones, 66 Dalston Lane, London E8 3AH. Tel.: 01-254 9331. (Retail Dept.) A.

Audio and radio servicing design modification installation etc. Will travel. R. Lucas. Tel.: Tadworth (Surrey) 2703. H.

Audio Hi-Fi Repairs, modifications, prototypes, special projects. Personal friendly advisory service on domestic installations. Professional consultant to offices, hotels, industry, exhibitions. (Almost) any gear—anywhere in U.K. Special overseas service. U.K. trade representation. M. A. Colwell, M.I.E.E.E., M.I.P.R.E. Tel.: St Albans (0727) 56535. G.

Audio repairs by electronics engineer, 30 years experience. Extensive facilities enabling equipment restoration, measurements, etc. Valved Radford/Quad speciality. Genuine personal service. Location: Woodford, Essex. Tel.: 01-504 5467. H.

WILMSLOW AUDIO THE FIRM FOR SPEAKERS



For the best prices and largest stocks in the country see our advertisements on pp. 127, 163.

Elliston Acoustics

For Competitive Prices & Personal Service.
Units for HFN (R. Fris) Daline Loudspeakers
Speaker Drive Units and Crossovers by:
KEF—SON-AUDAX—PEERLESS—STC (Coles)
CELESTION—JORDAN WATTS—FALCON etc.

Damping Materials

BAF Wadding—Long Fibre Wool—Terylene Wool

Send 10p in stamps for our **New Catalogue** (POST FREE)—(Overseas 50p or Dollar Bill). Exports Welcome

Elliston Acoustics

"Acoustica" Bennetts Corner, North End, Dunmow, Essex CM6 3PF

Telephone:

Great Dunmow (STD Code 0371) 820770

Mail Order (callers by appointment only)

WANTED

Cash paid for—all types equipment, amplifiers, decks, television sets, any quantity—new or reprocessed. Stan Willetts. Tel.: 021-553 0186. M.

One bronze Quad Electrostatic. Appearance unimportant. Can collect. Tel.: Coleman 01-686 5341 daytime; 01-654 4673 evenings. H.

DO-IT-YOURSELFERS

LOUDSPEAKER SUNDRIES

GRILLE FABRICS GALORE!!

33

PATTERNS

ANY SIZE CUT

TOP QUALITY WADDINGS

1" x 54" **B.A.F.** £1-10 per sq. yd.
2" x 54" **TERYLENE** £1-60 per sq. yd.
PURE WOOL FIBRES £1-60 per lb.

ACOUSTICALLY-TRANSPARENT BLACK FOAM PADDING

36p per square foot ¼" thick

P.&P. **WOOL** 20p per lb.

All other items **10% EXTRA**
MAX. P.&P. ANY ORDER 90p

Fabric Samples, Prices and Fitting Instructions for all materials,
12p (Stamps)

NICHOLS ACOUSTICAL FITMENTS
BUBWITH, SELBY, N. YORKS.
Telephone 0757 85-206

CROSSOVERS · COMPONENTS · KITS

Rogers, Pract. Hi-Fi & Audio, Oct. 1976
 Atkinson, Hi-Fi News, April 1976
 Fris, Hi-Fi News, May 1975
 Rogers, Hi-Fi, Ans., August 1973
 Colloms, Pop, Hi-Fi, April 1973

Units by: **STC (Goles) KEF, PEERLESS
 AUDAX, CELESTION & ISOPHON
 LONG FIBRE WOOL GRILLE FABRICS
 INDUCTORS CAPACITORS
 BAF WADDING 5 & 9 WATT RESISTORS
 50 ohm & 25 ohm POTENTIOMETERS
 ACOUSTICALLY TRANSPARENT FOAMS**
 Large stamped addressed envelope for latest
 price list PL10 and 5p stamps for samples.
 Overseas \$1 bill ACCESS

FALCON ELECTRONICS

Callers: 26 Station Rd., Bexhill-on-Sea, Sussex
 Mail Order & Callers: Tabor House, Mulbarton
 Nr. Norwich, Norfolk

DECODER mod. for **MATRIX-H** (HFN May '77
 issue. (a) Kit of parts only, £6. (b) Assembled board,
 £7; with 45J switch, £8-20. (c) Assembled board, 45J
 switch and power supply, £13-50. (d) In case, £15-80.

PICK-UP MATCHING UNIT AND BOOSTER
 (low imp.). Input 0.025-8 mV, 2-600 ohms. Output
 1 mV-500 mV, 40 k to 250 kohms. Gain > 32 dB
 10 Hz-150 kHz, mono or stereo, D.C. supply 3 volts.
 Assembled board, £8-80; in attractive case, £9-95.

AMBIENCE FROM STEREO PROGRAMMES.
 AMBI-3 and AMBI-5 add-on systems. Reproduce
 ambience from stereo programmes and recordings.
 AMBI-5 can also be used with discrete and matrix
 quadraphonic systems. Full details available August.
 Send s.a.e. NOW.

Send large s.a.e. now (x6½) plus loose 9p stamp. Ask
 us about connectors: send sketch or sample of your
 requirements. See **AUDIO CONNECTORS IDENTI-
 CHART.**

**BEACON AUDIO COMPONENTS, Dept N2,
 282 Hatfield Road, St Albans, Herts.**

STUDIO FACILITIES

Fanfare Records. Tape-disc pressings, demos, masters,
 studio/mobile. Neumann disc cutter. S.a.e. brochure.
 1 Broomfield Close, Rydes Hill, Guildford. Tel.: 0483-
 61684. X.

COUNTY RECORDING SERVICE. Stereo and mono
 masters and lacquer discs from your tapes. Tel.: Bracknell
 54935. London Road, Binfield, Bracknell, Berkshire. X.

Warren Recordings (members A.P.R.S.). Tape-disc
 demo-discs, pressings, cassettes. Studio and mobile. 59
 Hendale Avenue, London NW4 4LP. Tel.: 01-203 0306.
 X.

J. & B. Recordings. Disc cutting service. Demos,
 pressings from your tapes. Tape copying and editing—
 stereo/mono. S.a.e. 14 Willows Avenue, Morden, Surrey.
 Tel.: 01-648 9952. X.

Your tapes to disc. Mono or stereo cutting. Vinylite
 pressings, sleeves/labels. Top professional quality. S.a.e.
 for photo leaflet. Deroy Records, 'Eastwood', Cove,
 Dunbartonshire, Scotland. X.

Elstree Mobile Recording Studios. High quality cassette
 stereo copying. Lots 1-10,000. Mobile multi-track re-
 cording unit. Discs pressed from your source. Usual
 service offered to broadcasting stations. Tel.: 01-953
 6921/9021. 32 Deacons Hill Road, Elstree, Herts. G

**The closing date for Classified Ads.
 for August 1977 is 1st July '77.**

ADVERTISERS' INDEX

Abbey Records	107	Fidelity Fastenings	122	Mordaunt Short	14
Acoustical Manufacturing	19	Francis of Streattham	162	National Sound Systems	OBC
Allen, R.	144	Gale	2, 171	NEAL	143
AMSA	72, 73	Goodwins	159	Nusound	6, 7
Armstrong Audio	100	Grabern Audio	68	O'Brien, M.	8
Astra	68	Gratispool	10, 11	Philips	78
A. T. Labs	94	Guildford Hi Fi	54	Pickering	118
Audan	7	Hampshire Audio	150	Pickers & Cartridges	138
Audio Centre, Sheffield	62, 122	Harbeth Acoustics	58	Planet Hi Fi Centre	163
Audio T	114	Harman Kardon	80	Radford Hi Fi	26
Azat	58, 140	Hayden	155, 156	REW	143, 157, 158, 162
B & O	166	Heinitz, Thos.	156	Rogers	70
Badger Sound	138	Herts Hi-Fi	164, 165	Ross	15
Bats of Birmingham	144	H & H Hi-Fi	54	Shure	76
Bauch, F. W. O.	30	Hi-Fi Care	167	Sound Centre	22
Berkshire Hi Fi	145	Holden Photographic	66	Soundout Productions	160
Beyer Dynamic	64	Howland West	20	Speaker Selection	18, 62
Bib Hi Fi	64	IMF Electronics	9	Spendor	60
Brady	58	Jelleries	60	Sugden	162
BSR	74, 90, 117	J.R. Loudspeakers	28	Teletape	151
B & W Loudspeakers	86	Keesonic	52, 54	Top Tape	110
Castle Acoustics	84	KJ Leisuresound	66, 68, 152, 157	Uher	34
Cavendish Sales	154, 155	Koss	141	Unilet/UPL	54
CBS	120	Laskys	16, 17	Vennal, A. V.	144
Celef	56	Leak	92, 93	Vor International	98
Celestion Rola	128	Leisuretime	152	Watts, C. E.	88
Chartwell	120	Lloyd Paton	150	Wharfedale	38a, 38, 39
Click Shelving	166	Major Audio	161	Wicks, D. T.	142
Comet	146, 147, 148, 149	Marconi Elliott	168	Wilmslow Audio	126, 143
Compco	150	Mathers for Tape	150	ZeroStat	32
Crescent Records	122	Mayware	143		
Decca Records	122	McCulloch, A.	152		
Delta	130	McConomy	12, 13		
DES	124	Milty Products	160		
Dollands	24	Mission	40, 42, 44, 46, 48, 50		
DTR	62	Monitor Audio	5		
Ealing TV	153	Monitor Sound	98		
EMI	96				
Enigma Classics	106				
Estuary Audio	66				
Exhibition and Conference Services	157				
Exposure Hi Fi	143				
Farnell, A. C.	82, 83				



STOP PRESS
Gale Maximum Fidelity Records
are now available from
leading Hi-Fi retailers

Why is this record different from all other records?

Until now the only gramophone records you could buy suffered from a lack of dynamic range and restricted frequency response, and gave you almost as much surface noise, tape hiss, ticks and pops as they did good music. Now, for the first time, you can buy records which allow you to get the maximum performance from your high fidelity equipment. Gale Maximum Fidelity Recording Limited is a new company specifically formed to bring together the world's great musical heritage and state-of-the-art recording techniques.

Gale Maximum Fidelity Recordings will be available only through component high fidelity dealers, so stop in and listen. You might be surprised just how good Bach and Beethoven can sound.

- The first five albums are:
Seventeenth Century Italian Music Volume I
The London Early Music Ensemble conducted by Christopher Hogwood
Bach Complete Flute Sonatas
Christopher Taylor, Flute; Leslie Pearson, Harpsichord; Dennis Vigay, Cello
Music for Percussion Volume I
Tristan Fry Percussion Ensemble conducted by John Eliot Gardiner.
Beethoven Piano Sonatas Op. 53 and Op. 57
Peter Frankl
Schumann Frauenliebe und -leben and Brahms Lieder
Sheila Armstrong

Sole UK distribution:
Gale Electro/Sales Limited 23 Bruton Place London W1X 7AB

The competition won't like the sound of this at all.



For nearly two years, other manufacturers have been trying to produce tape with the qualities of the Maxell UD XL.

At the same time, Maxell have been quietly perfecting an even better series.

The new UD XL1 and UD XL11 tapes are designed to attain maximum performance at the ferric and chrome position on your tape deck. And Maxell are confidently making this claim: - whichever tape position you choose, no other cassette tape currently available can give you a better performance.

UD XL1 TAPE, FOR THE FERRIC POSITION (120 μ s)

UD XL1 offers an excellent sensitivity of 1 dB higher than even UD XL. MOL performance is also 1 dB higher over the entire audio frequency spectrum.

The result is a new standard in ferric tape, with wider dynamic range and less distortion than ever before.

How does UD XL1 compare then, with ordinary low-noise tapes?

Sensitivity is higher by 2.5 dB, and MOL performance by as much as 6 dB.

Yet, for all this UD XL1 requires no special bias or equalization. Simply set your tape selector as you normally would at the ferric position - but there the comparison ends.

UD XL11 TAPE, FOR THE CHROME POSITION (70 μ s)

UD XL11 tape is such a dramatic improvement on other tape that can be used in this position, that comparison is really unfair.

For example, if you're familiar with conventional chromium-dioxide tape, you'll know of the associated problems of head wear, poor output uniformity and relatively high price - plus low maximum output level and rather high distortion.

UD XL11 tape offers you excellent MOL, sensitivity, and an out-

put improvement of more than 2 dB over the entire frequency range.

EVEN THE NEW COBALT-DOPED TAPES CAN'T COMPARE

Maxell's unique 'Epitaxial' process guarantees absolute sensitivity and stability, *and no drop-out problems*. What's more, the shells are moulded in diamond cut dies, and made to tolerances 5 times greater than the Philips standard. And, like all Maxell tapes, UD XL11 has the unique 5-second cleaning leader.

In short, if you're recording in the chrome position, you can now achieve all the advantages - with none of the drawbacks.

A prospect we think you'll find very exciting - even if the competition don't.

maxell[®]
Pay a little extra,
get a whole lot more.