

PHILIPS HI-FI 1983/84



PHILIPS



This brochure introduces the new Philips Compact Disc and Hi-Fi range. 1983 has seen the most significant advance in Audio technology in two decades, the introduction of the Compact Disc system, invented and pioneered by Philips. On these few pages you will find full details of our Compact Disc Players, Hi-Fi systems and a range of separates including the new revolutionary flat membrane loudspeakers. We hope you will find equipment that interests you. If you require help in finding your local dealer, phone Teledata on 01-200-0200 or contact Philips Audio, Customer Enquiries, City House, 420-430 London Road, Croydon, CR9 3QR.

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Philips Compact Disc- The New Sound Sensation!

THE AUDIO REVOLUTION

There have been many technological advances in sound reproduction before, but Compact Disc represents the biggest single step forward ever made in Audio.

A single-sided disc, 12 cm. in diameter allows up to an hour's continuous play.

The playable side of the disc is gleaming silver.

It has no grooves; the digitally coded recording lies under the disc surface, invulnerable to dirt and damage.

The recording is read by a laser beam, which imposes no wear on the disc, and suffers none itself.

The sound is superb because the digital playback system ensures almost total accuracy in the decoded audio signal.

The signal to noise ratio (dynamic range) coupled with low distortion is far bigger than that of any other reproduction system.

Channel separation is total.

And there is no rumble or wow and flutter at all.

The Compact Disc player is designed for connection into any existing or new Hi-Fi system, just like another high-fidelity sound source.



It withstands vibrations and bumps, and offers new standards of operating convenience.

Compact Disc stands on the threshold of a new technology, offering unmistakably superior standards of sound reproduction.

Compact Disc is a totally new sound source: fully digital, and astonishingly accurate.

From the master recording right through to the stereo signal that feeds the audio amplifier – nothing is added, nothing is taken away.

From the lowest frequencies to the highest levels, the sound that is heard is an exact copy of the sound that was recorded; no detectable noise.

In a word, Compact Disc sound is purer – and you can certainly hear the difference.

PLENTIFUL SOFTWARE

Compact Disc already has big support from the recording studios. Many familiar labels, including all the major companies such as Phonogram, CBS, RCA, EMI and Decca, appear on these shining silver discs, so that a wide choice of music from the world's leading artistes is available. And choice will expand fast as more and more CD players come into use.

Here, without any doubt, is the sound source of the future.

DIGITAL SOUND REPRODUCTION

Sound is a variation of air pressure detectable by the ear. Until now, audio systems have worked on the analogue principle of converting air pressure variations into electrical voltage or current variations, processing them as necessary in the analogue state and then reproducing the sound waves through loudspeakers. This system, at its present state of development, works pretty well. But is practically at its final performance limits. Still, it is not possible to reproduce the original sound both exactly and



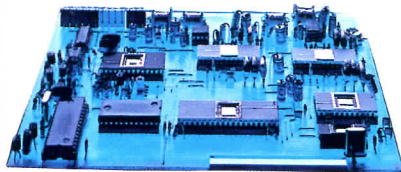
**COMPACT
disc
DIGITAL AUDIO**

consistently. This is very largely because inescapable factors such as e.g. non-linearities, power supply and temperature variations affect the actual shape of the analogue waveforms in the conversion processes.

With digitalisation, however, the road to substantial performance improvement is wide open. In digitalisation, the audio waveforms are sampled at high speed, and the value of each sample is measured. Each value is then converted to a digital number, in binary code (in digital terms this is known as a word or symbol). The string of successive binary numbers is the exact digital equivalent of the audio waveform. As long as the numbers maintain their true values, the waveform is expressed with an accuracy that depends only on the sampling speed and the resolution of the binary number.

ANALOGUE TO DIGITAL CONVERSION AND VICE VERSA

The conversion from analogue into digital signals is called P.C.M. (Pulse Code Modulation). The analogue waveform is sampled i.e. measured in short intervals. In the analogue to digital convertor, the measured values are quantized into a binary number and encoded into a pulse train. The pulse train is then fed into the transmission system. At the other end of the transmission system, the pulse train is detected and regenerated



into its original form. In the digital to analogue convertor, the reverse operation is formed. The pulse train passing through the digital to analogue convertor and the low pass filter is restored to the same continuous analogue waveform as that which was originally supplied.

The performance of the Philips range owes much to the advantages of the Compact Disc system – but more to the Philips genius for translating technological

sophistication into direct gains in performance. It is this built-in factor that so clearly distinguishes the Philips range from other Compact Disc players.

Digital filtering. The audio signal filtering – on which sound quality ultimately depends – is digital. Far more precise, stable and compact than an equivalent analogue filter.

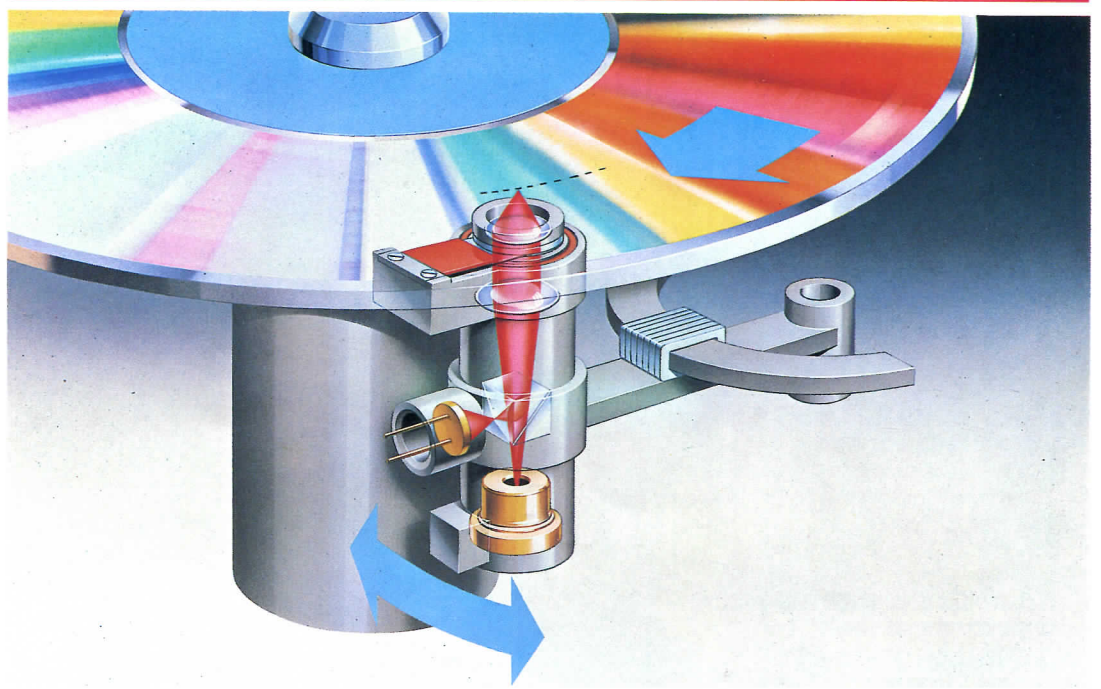
High-stability digital-to-analogue conversion The Philips digital-to-analogue converter is a 16-bit unit with digital oversampling filter, noise shaper, D/A chip, and simple analogue filter.

OPTICAL READ-OUT

Apart from digitalisation Compact Disc Digital Audio introduces another very significant innovation – optical read-out using a laser beam.

In essence, a laser is a special light source, producing highly concentrated light.

The Compact Disc laser is a small, low-power semi-conductor (aluminium gallium arsenide) unit, emitting invisible infra-red light. Its essential feature is a capacity for ultra-sharp focus, capable of reading a track with pits, only $0.5\mu\text{m}$ deep, approx. 1 to $3\mu\text{m}$ long at a track pitch of $1.6\mu\text{m}$.



The laser beam is directed through the transparent side of the disc and on to the disc track by the optical system. This is carried on a servo-controlled arm, which tracks radially from the inside to the outside of the disc. A second servo controls the position of the objective lens, to maintain ultra-sharp focus regardless of disc warp or any other unevenness in disc rotation.

Furthermore, the CIRC error correction system increases the capability to cope with severe optical distortion arising from dirt or damage.

The optical read-out system of Compact Disc Digital Audio ensures a read-out accuracy, from an extremely high-density digital recording, that no mechanical system could ever hope to attain.

DISC PRODUCTION

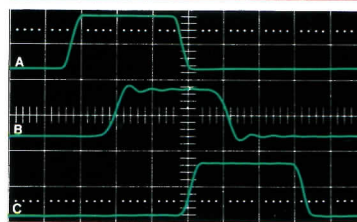
Like the conventional record, the basic disc is compression or injection moulded. It goes through

the same stages of pre-mastering, mastering and replication, but the production process is different in many respects, because the final product is of a much higher technological level. Several of these steps even have to be performed under clean room conditions.

The surface carrying the information pattern is coated with a microthin layer of aluminium to provide the reflective surface. Then, this fragile "mirror" layer is protected with a lacquer coating. Finally, the disc is precision-centred and the centre-hole is punched out.

Because of the digital playback system, every disc that successfully passes final inspection will reproduce absolute top quality sound, indistinguishable from the original CD-Tape Master.

The ready disc is packed in a luxury, consumer-friendly case, which also contains printed matter with artwork and program information.



PHILIPS HIGH-PRECISION DIGITAL FILTERING
THESE OSCILLOGRAMS SHOW THE CLEAR ADVANTAGE OF PHILIPS DIGITAL FILTERING.

- A. AUDIBLE TEST SIGNAL, AS RECORDED.
- B. NOTICEABLY DISTORTED OUTPUT FROM THE USUAL CD ANALOGUE FILTER.
- C. MUCH PURER OUTPUT FROM PHILIPS CD DIGITAL FILTER.

Pure, Perfect Sound - Forever.

MARKANTS TL CD63Z 298 [348]

Philips Compact Disc Players

SONY CDP-101 £399 [459]

THE BENEFITS OF PHILIPS COMPACT DISC DIGITAL AUDIO

The System.

- ★ The ultimate in sound reproduction.
- ★ Effective protection against dirt and scratches.
- ★ No wear on disc or pick-up.
- ★ Simple, versatile and convenient to use.
- ★ Compatible with existing HiFi equipment.
- ★ Uninterrupted playing time of max. 60 minutes stereo sound.

The Sound

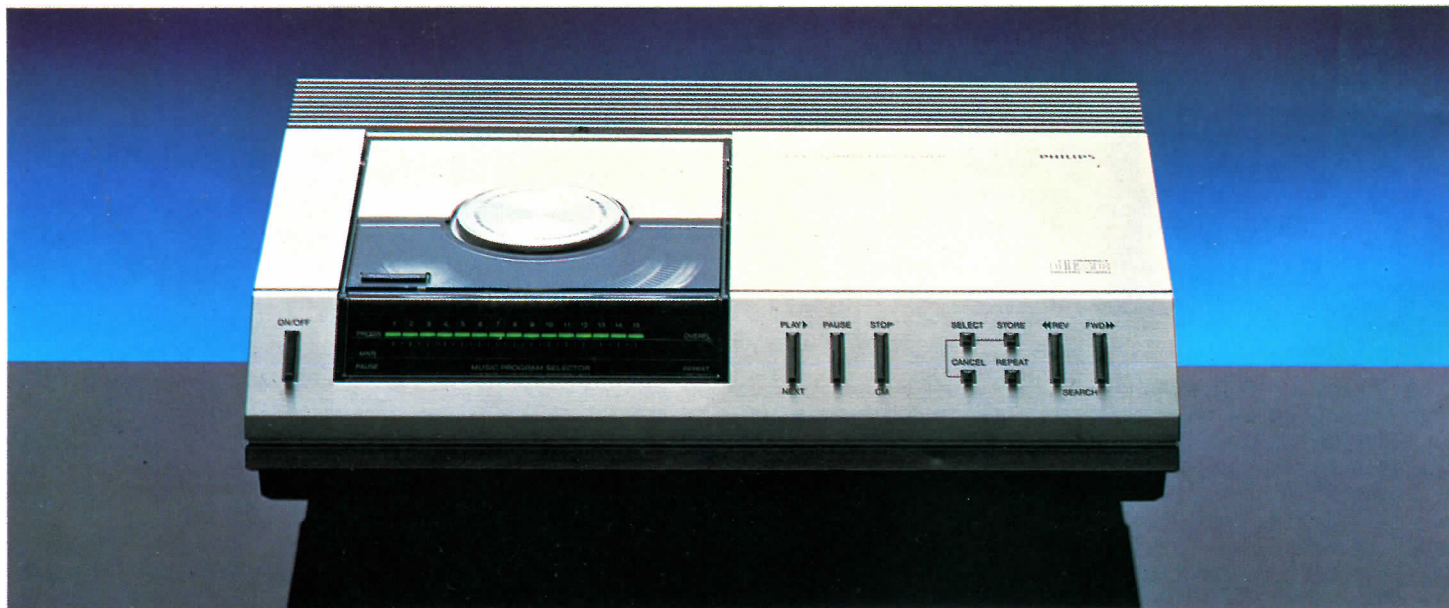
- ★ Greatly improved signal-to-noise ratio.
- ★ Full audio frequency range.
- ★ Negligible distortion.
- ★ Complete channel separation.
- ★ Complete absence of disturbing sounds.
- ★ Insensitive to microphony, shock and vibration.
- ★ No degradation in time.



GENERAL SPECIFICATIONS FOR CD 100, 202 & 303

Frequency response: - 20Hz-20kHz (± 0.3 dB)
 Phase linearity: - $\pm 0.5^\circ$
 Signal-to-noise ratio (dynamic range): - > 90 dB

Channel separation: - > 86 dB
 separation: - > 90 dB (at 1 kHz)
 T.H.D. (incl. noise): - $< 0.005\%$
 noise): - $< 0.004\%$ (at 1 kHz)
 Intermodulation distortion measured at max. output level: - < -86 dB
 Wow & Flutter: - Quartz Crystal Precision
 Max. Output Level (at MSB): - 2 V rms, typical
 Min. load Impedance: - 10 k ohms,



CD 100

STAND ALONE, SUPER COMPACT CD PLAYER

This is the world's smallest Compact Disc player. Designed as a stand-alone machine, the CD 100 is further proof of Philips giant lead in Compact Disc technology. Small, compact, but fully featured, the CD 100's performance is equal to the larger models in the Philips range.

The CD 100 is equipped with all the operational features that make Philips Compact Disc such a

highly versatile playback system: pre-programming of up to 15 tracks in any sequence required, forward and reverse location of specific music passages, repeat, next track and pause. A superb machine with outstanding performance figures to match in frequency range, dynamic response, channel separation, signal-to-noise and wow and flutter.

The CD 100 connects directly to the CD/TV, AUX or TAPE inputs of your HiFi (pre)amplifier. Switch on, insert the disc and you are enjoying the unique, pure and perfect sound of Philips Compact Disc.

Dimensions: - 320 x 73 x 267 mm (with lid closed)
 320 x 175 x 267 mm (with lid open)
 Weight: - 5kg approx.
 Power consumption: - 20 W approx.

£298
6 [348]



CD 202

**STAND ALONE,
TOP LOADING,
SLIM-LINE
COMPACT DISC
PLAYER**

Just 86 mm high, the CD 202 fits perfectly on top of a standard 420 mm wide HiFi rack as the crown of any HiFi installation. Top loading with front operated push button controls, the CD 202 delivers the pure, perfect sound of Compact Disc at the touch of a button.

The CD 202 is pre-programmable to play up to 15 tracks in any sequence – skipping those you don't want to hear and repeating your selection as often as you wish. Each preselection you

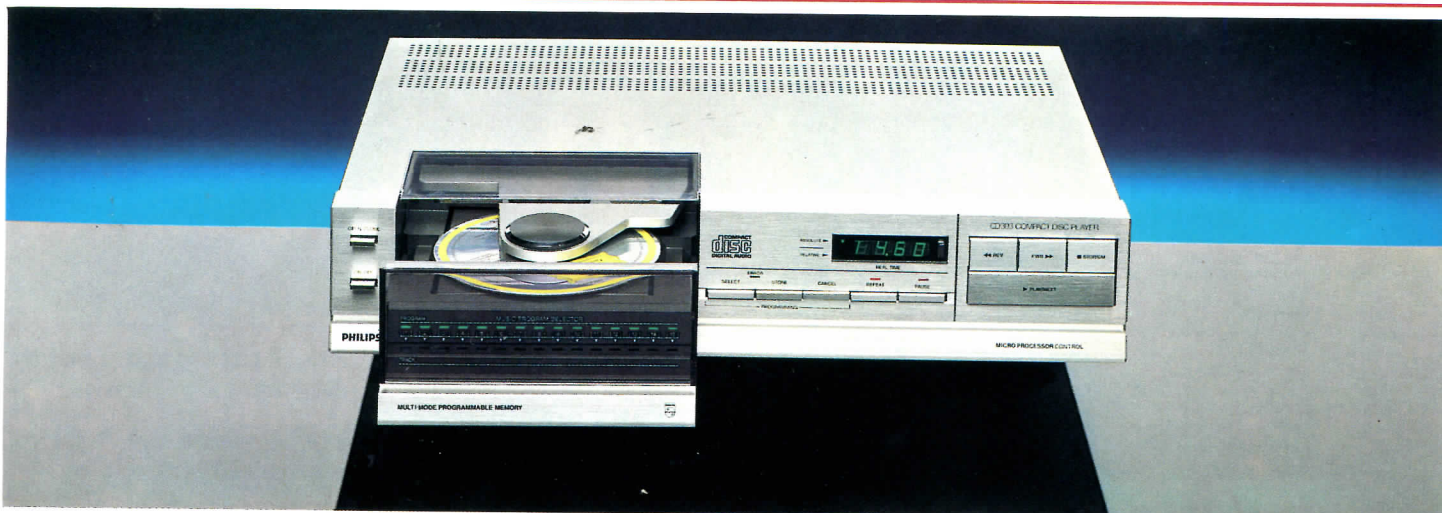
make is indicated by a LED which extinguishes once the track has been played. Location of a piece of music forwards or backwards, pause, repeat and selection of the next track are all operated by the touch of a button. No cueing, no danger of scratching your valuable discs. The CD 202 gives you precision control.

4 digit display time in minutes and seconds with push button for absolute elapsed time.

The CD 202 connects directly to the CD/TV, AUX or TAPE inputs of your HiFi(pre)amplifier. It comes complete with the Philips CD information pack containing complete operating instructions, demonstration disc, disc duster and full colour brochures about digital and laser technologies.

Dimensions: – 420 x 192 x 300 mm
(w x h x d)
 – 420 x 86 x 300 mm
 – (with lid closed)

Weight: – 6kg approx.
Power consumption: – 27 W approx.



CD 303

**FRONT LOADING
COMPACT DISC
PLAYER WITH
MOTORISED
DRAWER SYSTEM**

The CD 303, the third Compact Disc player in the Philips range, provides conclusive proof of Philips enormous lead in Compact Disc technology.

Just 86 mm high and 420 mm wide, this beautiful slim-line machine fits perfectly in or on top of a standard HiFi rack. The motorised front drawer makes loading and removing discs from the player absolutely effortless. And again, the controls are well laid out for simple, straightforward operation of the CD 303's versatile features.

The CD 303 features pre-programming capacity for up to 15 tracks in any sequence. The programmed tracks are indicated by LED's which extinguish once the track has been played. Play, next track; location of any point on a track – forwards or backwards, pause and repeat are all featured and all operated by single push button controls.

4 digit display time in minutes and seconds with push button for absolute elapsed time.

The CD 303 connects to your HiFi amplifier in exactly the same way as the CD 100 and CD 202 and comes complete with the same detailed information, demonstration disc and cleaning duster.

Dimensions: – 420 x 86 x 467 mm
(w x h x d)
 – 420 x 86 x 315 mm
 – (with drawer closed)

Weight: – 8kg approx.
Power consumption: – 30 W approx.

System 516

Specifications

F 7511 RECORD PLAYER

- Drive System: - Direct control with Quartz lock
- Turntable speeds: - 33 1/3 and 45 r.p.m.
- Wow and Flutter: - 0.05% (DIN) 0.03% (WRMS)
- Rumble: - 70 dB weighted (DIN B)
- Tracking error: - $\leq 0^{\circ} 9'/\text{cm}$
- Arm resonance frequency: - 10.5 Hz (with GP 401 Mk3)
- Headshell: - detachable mounting distance 12.7 mm acc to IEC
- Stylus force: - 7.5-30mN (0.75-3 gf) adjustable
- Anti-skating: - adjustable
- Pick-Up lift: - hydraulically damped
- Pick-Up cartridge: - GP 401 Mk3
- System: - Moving Magnet (MM)
- Frequency Response: - 20-20,000 Hz (± 2 dB)

F 2516 TUNER

- Wave ranges: - LW 146-263 k Hz
MW 513-1611 k Hz
FM 87.5-108 MHz
- Sensitivity: - AM 90 μ V for 26 dB S/N
FM mono 0.8 μ V for 26 dB S/N
FM stereo 20 μ V for 46 dB S/N
- Frequency Response FM: - 20-15000 Hz \pm 0.8 dB
- Stereo separation: - 46 dB (1 k Hz)
- Selectivity: - AM 60 dB at 9 k Hz
FM 65 dB at 300 k Hz
- Aerial Input: - 75 ohm coax and 300 ohm balanced

F 4516 AMPLIFIER

- Output Power: - 65W continuous sine wave per channel (IEC)
- Distortion: - 0.003% THD at 60W
0.01% IM at 60W
- Damping factor: - 55 x at 8 ohm
- Inputs: - Phono MD 1 & 2 2.5mV at 47 k ohm
Phono MC 0.1mV at 0.1 k ohm
Tape 1 & 2 150mV at 100 k ohm
Compact Disc/Aux 150mV at 100 k ohm
Tuner 150mV at 100 k ohm
Microphone 2mV at 47 k ohm
- Outputs: - Tape 1 & 2 150mV at 2.5 k ohm
Speakers 2 x 2 @ 8 ohm
MFB 1V at 1 k ohm
Headphones 8-600 ohm

F 6622 CASSETTE DECK

- Tape transport: - Solenoid
- Frequency Response (IEC): - Normal 30-16,000 Hz
Cr0230-17000 Hz
Metal 30-18000 Hz
- SN ratio (DIN/IEC): - Normal 56 dB
Cr0257 dB
Metal 60 dB
- Improvement: - 10 dB at 5 k Hz Dolby B
20 dB at 1 k Hz Dolby C
- Wow and Flutter: - 0.14% DIN, 0.045% WRMS
- Heads: - FSX recording/playback ferrite double gap erase

F 9414 LOUDSPEAKERS

- Volume: - 30 Litres
- Woofer: - 7 inch
- Mid-range: - 2 inch
- Tweeter: - 1 inch dome
- Power Handling: - 65 watt
- Frequency Response: - 38-20,000 Hz
- Sensitivity: - 89.5 dB (1W at 1m)
- Impedance: - 8 ohm



- Fully automatic operation (start run-in, stop and return) Direct Control, closed loop, belt drive system with Quartz P/LL speed lock for exceptionally low wow and flutter figures and very high long-term speed stability. Integrated floating suspension system protects turntable and tone arm from shock and vibration. Detachable, lightweight headshell with GP 401 Super M Mk 3 cartridge.

- Microprocessor control with Direct access to 29 memory pre-sets on any waveband. Up/Down automatic or variable-speed manual search on all wavebands. Non volatile (more than 10 year) station memory. Quartz/PLL frequency synthesis tuning system for ultraprecise

tuning with no frequency drift. FTD fluorescent Tube Display of tuned frequency and (when selected) preset channel number. 5-LED signal strength indicator. SNC Stereo Noise Cancellation cuts noise on weak stereo signals. SISC filter suppresses interference on stereo broadcasts. Ceramic filters with acoustic wave filter ensure high selectivity with very low distortion on FM.

- 65W continuous sine wave power per channel, both channels simultaneously driven into 8 ohm loads, according to IEC. Separate source-to-amplifier/source-to-tape selection for all functions. Connections for MD (2) and MC (1) pick-ups. Separate pre amp and power amp

circuitry provides for connection of equaliser. A,B, or A & B selection for two pairs of loudspeakers.

- Dolby* C noise reduction pushes tape noise down to undetectable levels, Dolby B noise reduction for existing recordings. Tip-touch logic-interlocked tape handling under microcomputer control. ALD automatic location device for fast, precise refind in record or playback models. 'Next Track' button skips any unwanted track.

- 4 element DRC loudspeaker. 30 litre closed cabinet. Dynamic bass processor, 7-inch woofer, 2-inch mid-range and 1-inch tweeter. 110 watt music power for high quality sound reproduction.

* Trade Mark of Dolby laboratories.

System 235

Specifications

F 7235 RECORD PLAYER

- Drive System: — Direct control with Quartz lock
- Motor Type: — DC
- Speeds: — 33 1/3 & 45 r.p.m.
- Wow & Flutter: — 0.07% DIN; 0.04% WRMS
- Rumble: — 68dB (DIN Bweighted)
- Tracking Error: — $\leq 0^{\circ} 9'$ /cm.
- Arm resonance: — 10 Hz (with GP331)
- Stylus force: — 1-3 gf adjustable
- Cartridge: — GP331 Moving Magnet (MM)
- Frequency Response: — 20-20,000Hz (± 3 dB)
- Stylus: — 7 x 18 μ m elliptical (diamond)
- Recomm. Force: — 2 gf

F 2235 TUNER

- Wave range: — LW 146-263 kHz
MW 513-1611 kHz
FM 87.5-108 MHz
- Sensitivity: — AM 150 μ V for 26 dB S/N (600 kHz)
FM mono 0.85 μ V for 26dB S/N
FM stereo 20 μ V for 46dB S/N
- Freq. Response FM: — 30-15000 Hz ± 1 dB
- Stereo separation: — 45dB (1kHz)
- Selectivity: — AM 55dB at 9 kHz
FM 65dB at 300 KHz
- Aerial Input: — 75 ohm co-ax and 300 ohm balanced.

F 4235 AMPLIFIER

- Output power: — 50W per channel (IEC)
- Distortion: — 0.005% THD at 45W 1 kHz
0.01% IM at 45W
- Damping Factor: — 45 x at 8 ohms
- Inputs: — Phono 2.5 mV at 47k ohm
Tape 1 & 2 150 mV at 47k ohm
Compact Disc 150 mV at 47k ohm
TV/Aux. 150 mV at 47k ohm
Tuner 150 mV at 47k ohm
- Outputs: — Tape 1 & 2 150 mV at 2.5k ohm
Speakers 2 x 2 @ 8 ohm
Headphone 8 - 1000 ohm

F 6335 CASSETTE DECK

- Tape Transport: — 2 motor servo solenoid
- Freq. Resp. (IEC): — normal 30-16000 Hz
CrO2 30-18000 Hz
Metal 30-18000 Hz
- S/N ratio (IEC): — normal 56dB
CrO2 59dB
Metal 59 dB
- Improvement: — 10dB at 5KHz Dolby B
20dB at 4KHz Dolby C.
- Wow & Flutter: — 0.12% DIN, 0.04% WRMS
- Heads: — FSX record/Playback
Ferrite double-gap erase

F 9430 LOUSPEAKERS

- Volume: — 27 Litres
- Woofer: — 8 inch plane disc
- Tweeter: — 1 inch isodome
- Filter: — 2L + 2C + R.
- Nominal Power: — 50 Watts
- Music Power: — 90 Watts
- Freq. Response: — 38-20000Hz
- Sensitivity: — 86 dB (1W at 1m)
- Impedance: — 8 ohm



- New 'Glide-Path' Tone Arm with integral pick-up head (GP 331) achieves 40% reduction in effective mass for better tracking, lower distortion and less wear. Quartz-locked direct control closed loop belt drive system with instantaneous error correction for exceptional speed stability. Fully automatic operation with front located controls.

- LW MW FM stereo quartz-lock digital tuner providing pre-selection of up to 47 stations, Non-volatile memory retains stations independently of power supply. Computer-standard tuning accuracy with clear fluorescent tube display of frequency or channel number. Slide-out memo drawer for logging stations.

- Full 50 watts continuous sine wave output per channel with DC

loudspeaker protection and protection against power amplifier overload. Connections for two pairs of loudspeakers with A, B, or A + B selection and LED indicator. Retractable flush fitting bass, treble and balance controls prevent accidental mis-adjustment. Connections for two tape recorders with full dubbing facility.

- Servo solenoid, feather touch tape transport with long life FSX record/playback head and double gap ferrite erase head. New and unique Azimuth Tape Error Correction (AZTEC) automatically adjusts head for optimum alignment providing azimuth error of 4' maximum. Fitted with both Dolby* B and C noise reduction systems and switching for normal, chromium and metal cassettes.

- New Plane Membrane loudspeaker design prevents cone break-up and distortion effects found in conventional loudspeaker designs. Isodome tweeter provides exceptionally smooth high frequency dispersion.

Very linear phase behaviour, because the movement of the radiation surface is coherent, phase shifts are extremely small.

All frequencies are reproduced by the entire radiating surface.

Linear radiation pattern, because the membrane distributes sound energy broadly and evenly from the entire surface.

- Speakers and rack finished in rich pallisander, smoked glass door and lid, fully adjustable shelving. The rack measures 895mm high, 459mm wide and 390mm deep.

System 231

Specifications

F 7230 RECORD PLAYER

- Drive System: — Belt Drive
- Motor Type: — synchronous, 24 pole
- Turntable speeds: — 33 $\frac{1}{3}$ and 45 r.p.m.
- Wow and Flutter: — 0.09% (DIN) 0.04% (WRMS)
- Rumble: — 65 dB weighted (DIN B)
- Effective arm length: — 215mm
- Tracking error: — $\leq 0^{\circ} 9'$ /cm
- Arm resonance frequency: — 10 Hz (with GP 330)
- Stylus force: — 10-30 mN (1-3 gf) adjustable
- Anti-skating: — adjustable
- Pick-Up lift: — viscosity damped
- Channel separation: — ≥ 24 dB (at 1 kHz)
- Stylus tip: — spherical 15 μ m (diamond)
- Recomm. stylus force: — 20 mN (2 gf)
- Pick-Up Cartridge: — GP 330 ELM Extra Low Mass System: — Moving Magnet (MM)
- Frequency Response: — 20-20,000 Hz (± 3 dB)

F 2233 TUNER

- Wave ranges: — LW 146-263 k Hz
MW 513-1611 k Hz
FM 87.5-108 MHz
- Sensitivity: — AM 150 μ V for 26 dB S/N (600 kHz)
FM mono 0.9 μ V for 26 dB S/N
FM stereo 20 μ V for 46 dB S/N
- Frequency Response: — 30-15000 Hz ± 1 dB
- Stereo separation: — 35 dB (1 kHz)
- Selectivity: — AM 55 dB at 9 k Hz
FM 50 dB at 300 k Hz
- Aerial Input: — 75 ohm coax and 300 ohm balanced

F 4234 AMPLIFIER

- Output Power: — 40W continuous sine wave per channel (IEC)
- Distortion: — 0.005% THD at 35W 1 kHz
0.02% 1M at 35W
- Damping factor: — 45 x at 8 ohm
- Inputs: — Phono 2.5m V at 47 k ohm
Tape 1 & 2 150mV at 47 k ohm
Compact Disc 150m V at 47 k ohm
TV/Aux 150m V at 47 k ohm
Tuner 150mV at 47 k ohm
- Outputs: — Tape 1 & 2 150mV at 2.5 k ohm
Speakers 2 x 2 @ 8 ohm
Headphones 8-1000 ohm

F 6233 CASSETTE DECK

- Tape transport: — Servo soft touch
- Frequency Response IEC: — Normal 30-15,000 Hz
CrO2 30-17000 Hz
Metal 30-17000 Hz
- SN ratio (IEC): — Normal 56 dB
CrO2 58 dB
Metal 58 dB
- Improvement: — 10 dB at 5 k Hz Dolby NR
- Wow & Flutter: — 0.16 % DIN, 0.06% WRMS
- Heads: — FSX recording/playback
Ferrite double gap erase

F 9237 LOUDSPEAKERS

- Type of enclosure: — Closed cabinet, 3 way system with 6 dB/Octave filtering
- Nominal Power: — 45W
- Music Power: — 80W
- Min. input power: — 5W
- Sensitivity: — 1W input produces 89 dB SPL at 1 metre
- System impedance: — 8 ohm
- Loudspeakers: — 8" woofer 3" squawker
1" dome tweeter
- Frequency characteristic: — 48-20,000 Hz
- System resonance: — 90 Hz



- New design "Glide Path" Tone Arm design with integral pick-up head achieves about 40% reduction in effective mass: gives better tracking, lower distortion and less wear.

New design GP330 MD Pick-Up Head with extra low mass of less than 3 gm.

- "Synchro Control" high-stability belt drive from low speed multipole synchronous motor.

- LW MW FM stereo quartz-lock digital tuner providing pre-selection of up to 47 stations, non-volatile memory retains stations independently of power supply. Computer standard tuning accuracy with clear fluorescent tube display of frequency or channel number. Slide-out memo drawer for logging stations.

- 40 Watts (IEC) continuous sine wave power per channel with DC loudspeaker protection and amplifier overload protection. Connections for two pairs of loudspeakers with A, B or A & B selection and LED indicator. Retractable flush fitting bass, treble and balance controls prevent accidental mis-adjustment. Connections for two tape recorders with dubbing facility.

- Servo soft-touch (motor assisted) tape keys for light yet positive operation. MSM modular-design tape transport, free-running and very reliable. Long-life heads: high-permeability FSX for record/play-back. Dolby B noise reduction.* Dual LED-bar display with 'over-modulation' segment for accurate record level monitoring. MPX filter

switch to stop pilot tone interference on recordings from FM. Time Standby Facility.

- 3-way closed box unit designed for superb sound reproduction. 80W music power rating ensures super quality sound, right up to full, big-power output. 8 inch woofer, 3 inch mid-range and 1 inch low distortion dome tweeter with full electrical filtering for smoothly balanced sound from 48-20,000Hz. Closed-box (acoustic suspension) system ensures high-accuracy bass response. Independently mounted drivers with stylish graphics behind detachable grille.

- Speakers and rack in rich pallisander with smoked glass door and lid and fully adjustable shelving.

System 433

Specifications

F 7430 RECORD PLAYER – WITH TANGENTIAL ARM

Drive System:	– Direct control
Motor Type:	– DC
Speeds:	– 33 $\frac{1}{3}$ and 45 r.p.m.
Wow and Flutter:	– 0.07% (DIN) 0.04% (WRMS)
Rumble:	– 68 dB (DIN B) weighted
Tracking Error:	– within $\pm 0.02^\circ$
Arm Resonance:	– 14 Hz (with GP 330)
Stylus:	– 2 gf
Cartridge:	– GP 330 Moving Magnet (MM)
Frequency Response:	– 20-20,000 Hz (± 3 dB)
Stylus:	– Spherical 15 μ m (diamond)
Recomm. Force:	– 2 gf

F 2434 TUNER

Wave Ranges:	– LW 146–263 kHz MW 513–1611 kHz FM 87.5–108 MHz
Sensitivity:	– AM 120 μ V for 26 dB S/N (600 kHz) FM mono 0.9 μ V at 75 kHz deviation for 26 dB S/N FM stereo 20 μ V at 75 kHz deviation for 46 dB S/N
Frequency Response FM:	– 20-15,000 Hz ± 1.5 dB
Stereo Separation:	– 35 dB (1 kHz)
Selectivity:	– AM 35 dB for 9 kHz FM 50 dB for 300 kHz
Aerial Input:	– 75 ohm coax and 300 ohm balanced

F 4433 AMPLIFIER

Output power:	– 30W per channel (IEC)
Distortion:	– 0.09%
Damping Factor:	– 42 at 1 kHz
Inputs:	– Phono 2.5mV at 47 k ohm Tape 150mV at 47 k ohm Compact Disc 150mV at 47 k ohm Aux 150mV at 47 k ohm
Outputs:	– Tape 150mV at 2.5 k ohm Speakers 2 x 2 @ 8 ohm Headphone 8-1000 ohm

F 6430 CASSETTE DECK

Tape Transport:	– Servo soft touch
Frequency Response (IEC):	– Normal 30-15,000 Hz CrO2 30-17,000 Hz Metal 30-17,000 Hz
S/N Ratio (IEC):	– Normal 56 dB CrO2 58 dB Metal 58 dB
Improvement:	– 10 dB at 5 kHz Dolby B
Wow and Flutter:	– 0.16% (DIN) 0.06% (WRMS)
Heads:	– FSX Record/Playback Ferrite Double Gap Erase

F 9236 LOUDSPEAKERS

Type of enclosure:	– Closed cabinet, 3 way system with 6 dB/Octave filtering
Nominal Power:	– 40W
Min. input power:	– 7W
Sensitivity:	– 1W input produces 89 dB SPL at 1 metre
System impedance:	– 8 ohm
Loudspeakers:	– 7" woofer 3" squawker 1" dome tweeter
Crossover frequencies:	– 3000 and 7800 Hz
Frequency characteristic:	– 48-20,000 Hz
System resonance:	– 100 Hz



- New 'Linear Tracking' Tone Arm with low mass integral pick up head (GP 330) achieves better tracking, lower distortion and less wear.

Motorised drawer loading, automatic stylus cleaning, repeat key for disc replay or memo selection. Direct control servo continuously controls turntable motor speed. Microcomputer control, maximum operating convenience using seven touch keys at the front of the unit.

- LW MW FM stereo Quartz lock tuning system providing pre-selection of up to 12 stations. Retains memory independently of power supply. At a glance fluorescent tube display (FTD) showing tuned frequency 'stereo reception' preset channel number.

- 30 watts continuous sine wave output per channel connections for two pairs of loudspeakers. Five function switching including Aux and CD sources. Function display by LED's.

- Servo Soft Touch (Motor Assisted) tape keys for light yet positive operation. Long life FSX record/playback head and double-gap ferrite erase head. Tape selector switch (Normal/Chrome/Metal) cassettes. Dolby B* noise reduction.

- 3 way closed box units designed to deliver hi-fi music performance. 70 watt music power rating for high quality sound even at full output. 7 inch woofer, 3 inch mid range and 1 inch low distortion dome tweeter with electrical filtering.

- Speakers and rack (not illustrated) in rich pallsander. Rack is self standing with facility for CD100 to be used with rack.

System 134

Specifications

F 7230 RECORD PLAYER

Drive System:	- Belt Drive
Motor:	- Synchronous, 24 pole
Turntable speeds:	- 33 $\frac{1}{3}$ and 45 r.p.m.
Wow and Flutter:	- 0.09% (DIN) 0.04% (WRMS)
Rumble:	- 65 dB weighted (DIN B)
Effective arm length:	- 215mm
Tracking error:	- $\leq 0^{\circ} 9'/\text{cm}$
Arm resonance frequency:	- 10 Hz (with GP 330)
Stylus force:	- 10-30 mN (1-3 gf) adjustable
Anti-skating:	- adjustable
Pick-Up lift:	- viscosity damped
Channel separation:	- $\geq 24\text{dB}$ (at 1 kHz)
Stylus tip:	- spherical 15 μm (diamond)
Recomm. stylus force:	- 20 mN (2 gf)
Pick-Up Cartridge:	- GP 330 ELM Extra Low Mass
System:	- Moving Magnet (MM)
Frequency Response:	- 20-20,000 Hz ($\pm 3\text{dB}$)

F 2133 TUNER

Wave ranges:	- LW 146-263 k Hz MW 513-1611 k Hz FM 87.5-108 MHz
Sensitivity:	- AM 120 μV for 26 dB S/N (600 kHz) FM mono 0.9 μV for 26 dB S/N FM stereo 20 μV for 46 dB S/N
Frequency Response FM:	- 20-15000 Hz $\pm 1.5\text{dB}$
Stereo Separation:	- 35 dB (1 k Hz)
Selectivity:	- AM 35 dB at 9 k Hz FM 50 dB at 300 k Hz
Aerial Input:	- 75 ohm coax and 300 ohm balanced

F 4132 AMPLIFIER

Output Power:	- 30W continuous sine wave per channel (IEC)
Distortion:	- 0.008% THD at 25W 1 kHz 0.02% 1M at 25W
Damping factor:	- 45 x at 8 ohm
Inputs:	- Phono MD 2.5m V at 47k ohm Tape 150mV at 47k ohm Compact Disc 150m V at 47k ohm TV/Aux 150m V at 47k ohm Tuner 150m V at 47k ohm
Outputs:	- Tape 150mV at 2.5k ohm Speakers 2 x 2 @ 8 ohm Headphones 8-1000 ohm

F 6133 CASSETTE DECK

Tape transport:	- Servo soft touch
Frequency Response (IEC):	- Normal 30-15,000 Hz Cr02 30-17000 Hz Metal 30-17000 Hz
SN ratio (IEC):	- Normal 56 dB Cr02 58 dB Metal 58 dB
Improvement:	- 10 dB at 5 k Hz Dolby NR
Wow & Flutter:	- 0.16% DIN, 0.06% WRMS
Heads:	- FSX recording/playback Ferrite double gap erase

F 9236 LOUDSPEAKERS

Type of enclosure:	- Closed cabinet, 3 way system with 6 dB/Octave filtering
Nominal Power:	- 40W
Min. input power:	- 7W
Sensitivity:	- 1W input produces 89 dB SPL at 1 metre
System impedance:	- 8 ohm
Loudspeakers:	- 7" woofer 3" squawker 1" dome tweeter
Crossover frequencies:	- 3000 and 7800 Hz
Frequency characteristic:	- 48-20,000 Hz
System resonance:	- 100 Hz



- New design "Glide Path" Tone Arm design with integral pick-up head achieves about 40% reduction in effective mass: gives better tracking, lower distortion and less wear.

New design GP 330 MD Pick-Up Head with extra low mass of less than 3 gm.

"Synchro Control" high-stability belt drive from low speed multipole synchronous motor. Fully automatic operation.

- Microprocessor-controlled digital (frequency synthesis) tuning offering choice of:

- 8 FM, 3 MW and 1 LW memory presets with up/down variable speed scanning for sequential selection.

- Up/down automatic search tuning on FM.

- Up/down step-or-run manual tuning on all wavebands. Automatic FM Mute to cut out interstation tuning noise.

Sliding Stereo decoder maintains

full channel separation on strong signals, changing gradually to mono for fullest noise suppression on weak signals.

- Full 30W (IEC) continuous sine wave per channel. Low total harmonic distortion and high signal-to-noise ratio ensure excellent sound quality at all levels. Connections for two pairs of loudspeakers.

Electronic protection against loudspeaker short-circuit and power amplifier overload. Light-touch push buttons. Connection for Compact Disc player. Dubbing facility with monitoring, from second recorder.

- Servo soft-touch (motor assisted) tape keys for light yet positive operation. MSM modular-design tape transport, free-running and very reliable. Long-life heads. Push button bias and equalisation selection.

Dolby * B noise reduction.

Dual LED-bar display with "over-modulation" segment for accurate record level monitoring. "Draw-pot" for single-hand level and balance setting. MPX filter switch to stop pilot tone interference on recordings from FM. Timer Standby facility. Soft cassette eject. Stereo microphone and headphone sockets. Phono type and DIN type Line in/Line out connection facilities.

- 3-way closed box units designed to deliver high-fidelity music performance. 70W music power rating for high quality sound, even at full sound output.

7 inch woofer, 3 inch mid-range and 1 inch low distortion dome tweeter with electrical filtering.

- Speakers and rack finished in rich pallisander, smoked glass door and lid, fully adjustable shelving. The rack measures 895mm high, 459mm wide and 390mm deep.

System 131

Specifications

F 7130 RECORD PLAYER

- Drive System: - Belt Drive
- Motor Type: - synchronous, 24 pole
- Turntable speeds: - 33 $\frac{1}{3}$ and 45 r.p.m.
- Wow and Flutter: - 0.09% (DIN) 0.04% (WRMS) 65 dB weighted (DIN B)
- Tracking error: - $\leq 0^{\circ} 9'$ /cm
- Arm resonance frequency: - 10 Hz (with GP 330)
- Stylus force: - 20 mN (2 gf) adjustable
- Anti-skating: - Compensated
- Pick-Up Cartridge: - GP 330 ELM Extra Low Mass
- System: - Moving Magnet (MM)
- Frequency Response: - 20-20,000 Hz (± 3 dB)

F 2131 TUNER

- Wave ranges: - LW 150-255 k Hz
MW 520-1605 k Hz -
FM 87.5-108 MHz
- Sensitivity: - AM 100 μ V for 26 dB S/N (600 kHz)
FM mono 1 μ V for 26 dB S/N
FM stereo 22 μ V for 46 dB S/N
- Frequency Response: - 30-15000 Hz ± 1.5 dB
- Stereo separation: - 35 dB (1 k Hz)
- Selectivity: - AM 35 dB at 9 k Hz
FM 50 dB at 300 k Hz
- Aerial Input: - 75 ohm coax and 300 ohm balanced

F 4130 AMPLIFIER

- Output Power: - 25W continuous sine wave per channel (IEC)
- Distortion: - 0.008% THD at 20W 1 kHz
0.02% IM at 20 W
- Inputs: - Phono 2.5m V at 47 k ohm
Tape 150mV at 47 k ohm
Compact Disc/Aux 150m V at 47 k ohm
Tuner 150m V at 47 k ohm
- Outputs: - Tape 150mV at 2.5 k ohm
Speakers 8 ohm
Headphones 8 - 1000 ohm

F 6133 CASSETTE DECK

- Tape transport: - Servo soft touch
- Frequency Response (IEC): - Normal 30-15,000 Hz
Cr02 30-17000 Hz
Metal 30-17000 Hz
- SN ratio (IEC): - Normal 56 dB
Cr02 58 dB
Metal 58 dB
- Improvement: - 10 dB Dolby NR at 5 kHz

F 9235 LOUDSPEAKERS

- Type of enclosure: - Bas-reflex cabinet, 2 way system with 6 dB/Octave filtering
- Nominal Power: - 30W
- Music Power: - 50W
- Min. input power: - 7W
- Sensitivity: - 1W input produces 88 dB SPL at 1 metre
- System impedance: - 8 ohm
- Loudspeakers: - 7" woofer 2" tweeter
- Crossover frequency: - 3600 Hz



- New design 'Glide Path' Tone Arm design with integral pick-up head achieves about 40% reduction in effective mass: gives better tracking lower distortion and less wear.

New design GP 330 MD pick-up head with extra-low mass of less than 3 gm.

Synchro Control high-stability belt drive from low-speed multipole synchronous motor.

- Smooth flywheel tuning, long tuning scale and bi-coloured LED 'on-tune' indicator for easy station finding and sharp tuning. Automatic FM mute to cut out interstation tuning noise. Automatic Tuning Lock for stable FM reception. 'Sliding Stereo' decoder (with LED) maintains full channel separation on strong signals, gradually changing to mono for full noise suppression on weak signals.

- Full 25W (IEC) continuous sine wave per channel. Low total harmonic distortion and high signal-to-noise ratio ensure excellent sound quality at all levels.

Light touch push-buttons featuring Phono, Tape, Tuner and CD/TV/Aux selection with LED indicators. Loudness button for gentle bass emphasis at low volumes. Stereo/mono mode selection. Connection for Compact Disc Digital Audio player. Dubbing facility with monitoring, from second recorder.

- Servo soft-touch (motor assisted) tape keys for light yet positive operation. MSM modular-design tape transport, free-running and very reliable. Push button bias and equalisation selection. Dolby * B noise reduction. Dual LED bar display with 'over-

modulation' segment for accurate record level monitoring. 'Draw-pot' for single-hand level and balance. MPX filter switch to stop pilot tone interference on recordings from FM. Timer Standby facility.

- 2-way bass-reflex units designed to deliver full music performance 50W music power rating ensures quality sound, right up to top volume. 7 inch woofer and 2 inch tweeter. Tuned bass-reflex port extends bass response without loss of accuracy.

- Speakers and rack finished in rich pallisander, smoked glass door and lid, fully adjustable shelving. The rack measures 895mm high, 459mm wide and 390mm deep.

System 1530

Specifications

RECORD PLAYER

- Turntable
Speeds: - 33 $\frac{1}{3}$ and 45 r.p.m.
Wow and Flutter: - 0.15% (DIN); 0.09% (WRMS)
Rumble: - 60 dB weighted (DIN B)
Stylus Force: - 22 mN (2.2 gf) fixed
Anti-skating: - Fixed
Pick-up cartridge supplied GP 330
System: - Moving Magnet (MM)
Frequency Response: - 20-20,000 Hz (\pm 3 dB)
Sensitivity: - 0.8mV/cm/sec. (at 1 kHz)

TUNER

- Wave Range: - LW 150-255 kHz
MW 520-1605 kHz
FM 87.5-108 MHz
Sensitivity: - AM 100 μ V for 26 dB S/N
(600 kHz)
FM mono 1 μ V 26 dB S/N
FM stereo 40 μ V 46 dB S/N
Frequency Response: - FM 50 - 12500 Hz \pm 1.5 dB
Stereo Separation: - 31 dB (1 kHz)
Selectivity: - AM 32 dB @ 9 kHz
FM 55 dB @ 300 kHz
Aerial Input: - 75 ohm coax and 300 ohm balanced

AMPLIFIER

- Output Power: - 2 x 15 W Continuous sine wave per channel (IEC)
Distortion: - D \leq 10% @ 2 x 15 W
THD: - D \leq 0.3% @ 2 x 1 W
Inputs: - Microphone 1.5mV @ 1.5 k ohm
Auxiliary 150 mV @ 47 k ohm
Outputs: - Speakers 8 ohm
Headphone 8-600 ohm

CASSETTE DECK

- Tape transport: - Soft-touch RTS
Frequency Response (IEC): - Normal 40-12500 Hz
CrO2 40-13000 Hz
Metal 40-14000 Hz
SN ratio (IEC): - Normal 52 dB
CrO2 54 dB
Metal 54 dB
Improvement: - Dolby NR @ 5 kHz 10 dB
Wow and Flutter: - 0.2% DIN 0.1% WRMS
Heads: - Longlife recording/playback
Ferrite double gap erase

F 9234 LOUDSPEAKERS

- Type of Enclosure: - bass reflex
Nominal Power: - 20W
Sensitivity: - 1 W Input Produces 87 dB SPL at 1m
System impedance: - 8 ohm
Loudspeakers: - 7" Woofer & 2" Tweeter
Frequency characteristic: - 55 - 18,000 Hz



INTEGRATED STEREO SYSTEM

- 2 speeds, Automatic stop with tone arm lift and return. Electronic motor control with low rumble and wow and flutter. Straight tone arm with GP 330 MD cartridge and low-friction bearings.

- Full-width tuning dial featuring bi-colour 'on-tune' LED indicator. FM, MW and LW bands. FM stereo reception with automatic stereo/mono selection and LED stereo indicator.

AFC for high stability FM reception.

- 2 x 25 Watts music power/solid state output stage with safety protection against loudspeaker short circuit and overheating. 5-LED power indication. Rotary source selector. (FM/MW/LW/Phono/Tape and CD/TV).

- Soft touch keys, Bias and equalisation selection for Metal (Type IV) CrO2 (type II) and Normal (Type I) cassettes. Dolby B noise reduction. Automatic record level control.

Full autostop. Tape counter.

- Single unit design in smart dark brown, housed in rich pallisander rack with smoked glass door and lid.

Flat Membrane Loudspeakers

DRC Mk11 SERIES

The conventional loudspeaker cone has been used very successfully now for many years.

Now, with the introduction of Compact Disc, a very large improvement in domestic performance capability has been achieved and the need to rethink loudspeaker design has produced a concept to overcome the known deficiencies of the existing models.

The flat membrane principle still employs a cone-type drive but

the cone is coupled to a rigid plane membrane mounted perpendicular to the drive coil. The membrane is coupled to the cone at its nodal radius (the point of zero displacement under any resonant condition) and this ensures that the entire surface of the membrane responds uniformly to the drive at all frequencies and amplitudes.

- New, lower mass, precision balanced dynamic bass processors for even better range and lower distortion at low frequency.

- 8-inch nodally-driven plane disc woofers and 3-inch direct-coupled disc mid-range speakers, with extra large magnets. For resonance-free, phase linear sound with no cavity (tunnel) or break-up effects, and very linear radiation pattern.
- 1-inch isodome tweeter with extended horizontal radiation pattern or new Isophase unit with minimal-mass membrane for phase linear sound with brilliant transient response, extended high-

frequency response, high power-handling and extremely low distortion.

- Column-style floor standing cabinets with acoustically transparent detachable grilles and rich pallisander finish.



F 9430

Dynamic bass processor, 8-inch woofer, 1-inch isodome tweeter. 35 litre cabinet. Music power 90W.

System:	- DRC
Woofer (Size):	- 8" Plane Disc
Midrange (Size):	-
Tweeter (Type):	- 1" Isodome
Nominal Power in Watts:	- 50
Music Power in Watts:	- 90
Impedance (Ohms):	- 8
Sensitivity at 1W at 1m (dB):	- 86
Frequency Response (Hz):	- 38-20,000



F 9432

Dynamic bass processor, 8-inch plane disc woofer, 3-inch plane disc mid-range. 1-inch isodome tweeter. 45 litre cabinet. Music power 120W.

System:	- DRC
Woofer (Size):	- 8" Plane Disc
Midrange (Size):	- 3" Plane Disc
Tweeter (Type):	- 1" Isodome
Nominal Power in Watts:	- 60
Music Power in Watts:	- 120
Impedance (Ohms):	- 8
Sensitivity at 1W at 1m (dB):	- 87.5
Frequency Response (Hz):	- 33-20,000



F 9434

Dynamic bass processor, 8-inch plane disc woofer, 3-inch plane disc mid-range, isophase tweeter. 55 litre cabinet. Music power 140W.

System:	- DRC
Woofer (Size):	- 8" Plane Disc
Midrange (Size):	- 3" Plane Disc
Tweeter (Type):	- Isophase
Nominal Power in Watts:	- 80
Music Power in Watts:	- 140
Impedance (Ohms):	- 8
Sensitivity at 1W at 1m (dB):	- 88
Frequency Response (Hz):	- 30-40,000



Hi-Fi Loudspeakers

F9236

3-way closed box units designed to deliver high fidelity music performance.

70W music power rating for high quality sound, even at full sound output.

7 inch woofer, 3 inch mid-range and 1 inch low distortion dome tweeter with electrical filtering.

System:	- Closed
Woofer (Size):	- 7"
Midrange (Size):	- 3"
Tweeter (Type):	- 1" Dome
Nominal Power in Watts:	- 40
Music Power in Watts:	- 70
Impedance (Ohms):	- 8
Sensitivity at 1W at 1m (dB):	- 89
Frequency Response (Hz):	- 48-20,000

Separates

F 3235 EQUALIZER

10 slider controls to ensure high precision frequency compensation anywhere in the audio band. Level adjustment range ± 10 dB.

'Defeat' key for direct comparison. Adapts sound balance to suit room acoustics and different types of music.

Tape In and Tape Out sockets for direct cassette deck connection. Line/Tape selector key. Source Tape/Monitor key.

CIRCUITRY

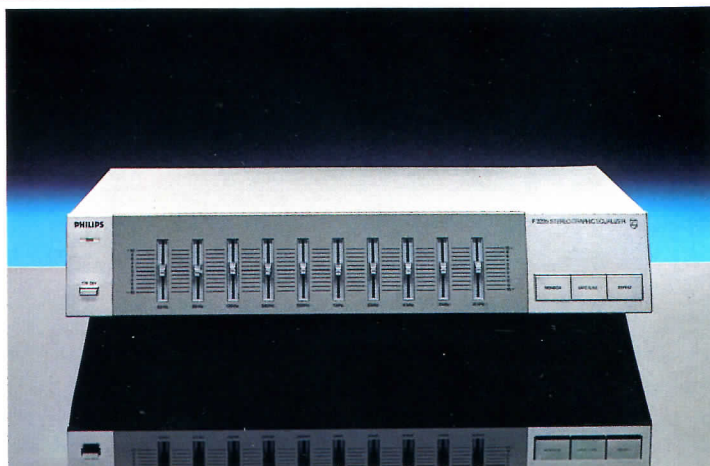
Total harmonic Distortion:	- 0.01% for 20,000 Hz
Frequency Response:	- 10-30,000 Hz ± 1 dB
S/N Ratio:	- 86 dB weighted 86 dB unweighted
Stereo separation:	- 60 dB at 1 kHz 40 dB at 250 - 10,000 Hz

CONTROLS

Frequency equalizer:	- ± 10 dB at 30, 60, 120, 240, 500, 1000, 2000, 4000, 8000 and 16,000 Hz
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INPUTS / OUTPUTS

Line In:	- 1.1V at 10 k ohm
Tape In:	- 1.1 V at 100 k ohm
Line Out:	- 1V at 3.8 k ohm
Tape Out:	- 1V at 3.8 k ohm



F 3538 SOUND PROCESSOR

Ambience adjustment magnifies the stereo image much beyond the actual loudspeaker spacing to create 3-dimensional sound.

Echo adjustment introduces controlled reverberation; creates authentic live performance conditions. Separate 5 band equalizers (switchable).

Switchable sound field display.

Connects directly between Line Out and Line In terminals of an integrated amplifier.

CIRCUITRY

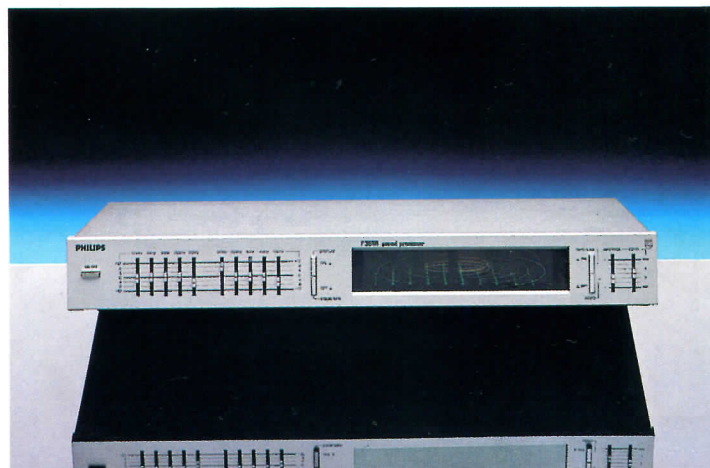
Frequency Response:	- 20-20,000 Hz ± 1 dB
S/N Ratio:	- 85 dB weighted 70 dB unweighted
Stereo separation:	- 60 dB at 1 kHz 50 dB at 250 - 10,000 Hz

CONTROLS

Frequency equalizer:	- ± 10 dB at 60, 250, 1000, 4000 and 12000 Hz
Echo time:	- 80 msec
Ambience radiation:	- up to 240°

INPUTS / OUTPUTS

Line In:	- 150 mV at 47 k ohm
Tape In:	- 150 mV at 47 k ohm
Line Out:	- 150 mV at 1 k ohm
Tape Out:	- 150 mV at 1 k ohm



F 7230 RECORD PLAYER

New design "Glide Path" Tone Arm design with integral pick-up head achieves about 40% reduction in effective mass: gives better tracking, lower distortion and less wear.

New design GP330 MD Pick-Up Head with extra low mass of less than 3 gm.

"Synchro Control" high-stability belt drive from low speed multipole synchronous motor.

Drive System:	- Belt Drive
Motor Type:	- synchronous, 24 pole
Turntable speeds:	- 33 1/3 and 45 r.p.m.
Wow & Flutter:	- 0.09% (DIN), 0.04% (WRMS)
Rumble:	- 65 dB weighted (DIN B)
Tracking error:	- $\leq 0^\circ 9'$ /cm
Arm Resonance Frequency:	- 10 HZ (with GP 330)
Stylus Force:	- 10-30 mN (1-3 gf), adjustable
Anti-Skating:	- Adjustable
Pick-up Lift:	- Viscosity Damped
Channel Separation:	- ≥ 24 dB (at 1 kHz)
Stylus Tip:	- Spherical 15 μ m (Diamond)
Recomm. Stylus Force:	- 20mN (2 gf)
Pick-Up Cartridge:	- GP 330 ELM Extra Low Mass System:
Frequency Response:	- 20-20,000 Hz (± 3 dB)

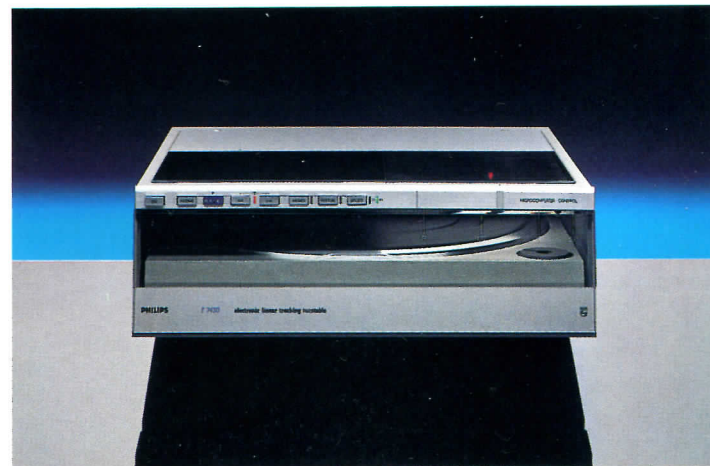


F 7430 RECORD PLAYER

New 'Linear Tracking' Tone Arm with low mass integral pick up head (GP 330) achieves better tracking, lower distortion and less wear.

Motorised drawer loading, automatic stylus cleaning, repeat key for disc replay or memo selection. Direct control servo continuously controls turntable motor speed. Microcomputer control, maximum operating convenience using seven touch keys at the front of the unit.

Drive System:	- Direct Control
Motor Type:	- DC
Speeds:	- 33 1/3 and 45 r.p.m.
Wow and Flutter:	- 0.07% (DIN) 0.04% (WRMS)
Rumble:	- 68 dB (DIN B) weighted
Tracking Error:	- Within $\pm 0.02^\circ$
Arm Resonance:	- 14 Hz (with GP 330)
Stylus:	- 2 gf
Cartridge:	- GP 330 Moving Magnet (MM)
Frequency Response:	- 20-20,000 Hz (± 3 dB)
Stylus:	- Spherical 15 μ m (diamond)
Recomm. Force:	- 2 gf



Separates



F 4132 AMPLIFIER

Low total harmonic distortion and high signal-to-noise ratio ensure excellent sound quality at all levels. Connections for two pairs of loudspeakers.

Electronic protection against loudspeaker short-circuit and power amplifier overload.

Light-touch push buttons.

Connection for Compact Disc Digital Audio player. Dubbing facility with monitoring, from second recorder.

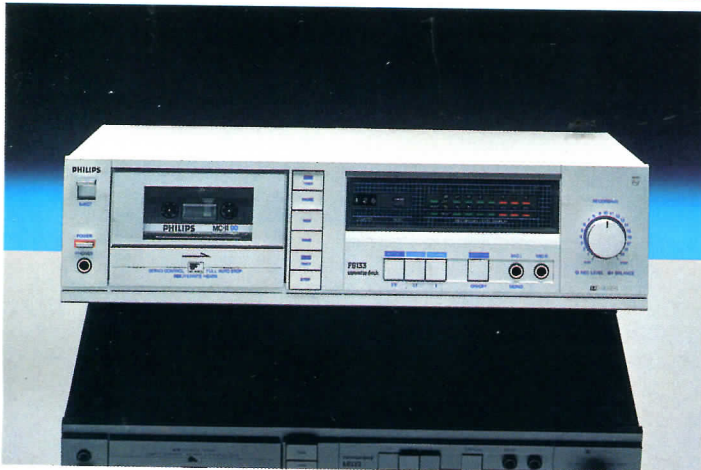
- Output Power: - 30W continuous sine wave per channel (IEC)
- Distortion: - 0.008% THD at 25W 1 kHz
0.02% IM at 25W
- Damping Factor: - 45 x at 8 ohm
- Inputs: - Phono MD 2.5mV at 47k ohm
Tape 150 mV at 47 k ohm
Compact Disc 150mV at 47 k ohm
TV/Aux 150 mV at 47 k ohm
Tuner 150 mV at 47 k ohm
- Outputs: - Tape 150mV at 2.5 k ohm
Speakers 2 x 2 @ 8 ohm
Headphones 8-1000 ohm



F 4235 AMPLIFIER

Full 50 watts continuous sine wave output per channel with DC loudspeaker protection and protection against power amplifier overload. Connections for two pairs of loudspeakers with A,B, or A & B selection and LED indicator. Retractable flush fitting bass, treble and balance controls prevent accidental mis-adjustment. Connections for two tape recorders with full dubbing facility.

- Output Power: - 50W per channel (IEC)
- Distortion: - 0.005% THD at 45W 1 kHz
0.01% IM at 45W
- Damping Factor: - 45 x at 8 ohms
- Inputs: - Phono 2.5 mV at 47-k ohm
Tape 1 & 2 150 mV at 47 k ohm
Compact Disc 150 mV at 47 k ohm
TV/Aux. 150 mV at 47 k ohm
Tuner 150 mV at 47 k ohm
- Outputs: - Tape 1 & 2 150 mV at 2.5 k ohm
Speakers 2 x 2 @ 8 ohm
Headphone 8-1000 ohm



F 6133 CASSETTE DECK

Servo soft-touch (motor assisted) tape keys for light yet positive operation. MSM modular-design tape transport, free-running and very reliable. Push button bias and equalisation selection. Dolby* B noise reduction.

Dual LED bar display with 'over-modulation' segment for accurate record level monitoring. 'Draw-pot' for single-hand level and balance. MPX filter switch to stop pilot tone interference on recordings from FM. Timer Standby facility.

- Tape transport: - Servo soft-touch
- Frequency response (IEC): - Normal 30-15000 Hz
CrO2 30-17000 Hz
Metal 30-17000 Hz
- SN ratio (IEC): - Normal 56 dB
CrO2 58 dB
Metal 58 dB
- Improvement: - 10 dB Dolby NR at 5 kHz
- Wow and Flutter: - 0.16% DIN 0.06% WRMS
- Heads: - FSX recording/playback
Ferrite double-gap erase



F 6335 CASSETTE DECK

Servo solenoid, feather touch tape transport with long life FSX record/playback head and double gap ferrite erase head. New and unique Azimuth Tape Error Correction (AZTEC) automatically adjusts head for optimum alignment providing azimuth error of 4' maximum. Fitted with both Dolby* B and C noise reduction systems and switching for normal, chromium and metal cassettes.

- Tape Transport: - 2 motor servo solenoid
- Frequency response (IEC): - Normal 30-16000 Hz
CrO2 30-18000 Hz
Metal 30-18000 Hz
- S/N Ratio (IEC): - Normal 56dB
CrO2 59dB
Metal 59 dB
- Improvement: - 10dB at 5 kHz Dolby B
20dB at 4 kHz Dolby C
- Wow and Flutter: - 0.12% DIN, 0.04% WRMS
- Heads: - FSX Record/Playback
Ferrite double-gap erase

Accessories

Microphones

EM8411 Stereo electret condenser microphone with metal mesh windscreen.

EM8111 Unidirectional electret condenser microphone for use with all recording equipment

EM8711 High quality unidirectional electret condenser microphone suitable for voice and music recording. Tapered housing with metal mesh windscreen.



Headphones

EM6421 Electrodynamic stereo headphones with fully adjustable slimline earshells. Excellent sound quality over a 20-20,000 Hz frequency range. Supplied with a standard 6.3mm jack plug.

EM6126 Electrodynamic stereo headphone with mono/stereo switch and volume controls. Supplied with a standard 6.3mm jack plug.

EM6122 Lightweight stereo headphone ideal for use with portable audio equipment. It is supplied with a mini 3.5mm stereo jack plug and an adaptor for connection to 6.3mm sockets.

EM 6721 Balanced electret Hi-Fi stereo headphone designed for high quality audio equipment. Fitted with 6.3mm stereo jack plug.



Cassettes

A new range of C60 and C90 Cassettes from the inventors of the Compact Cassette – a range designed to give maximum performance across all types of equipment.

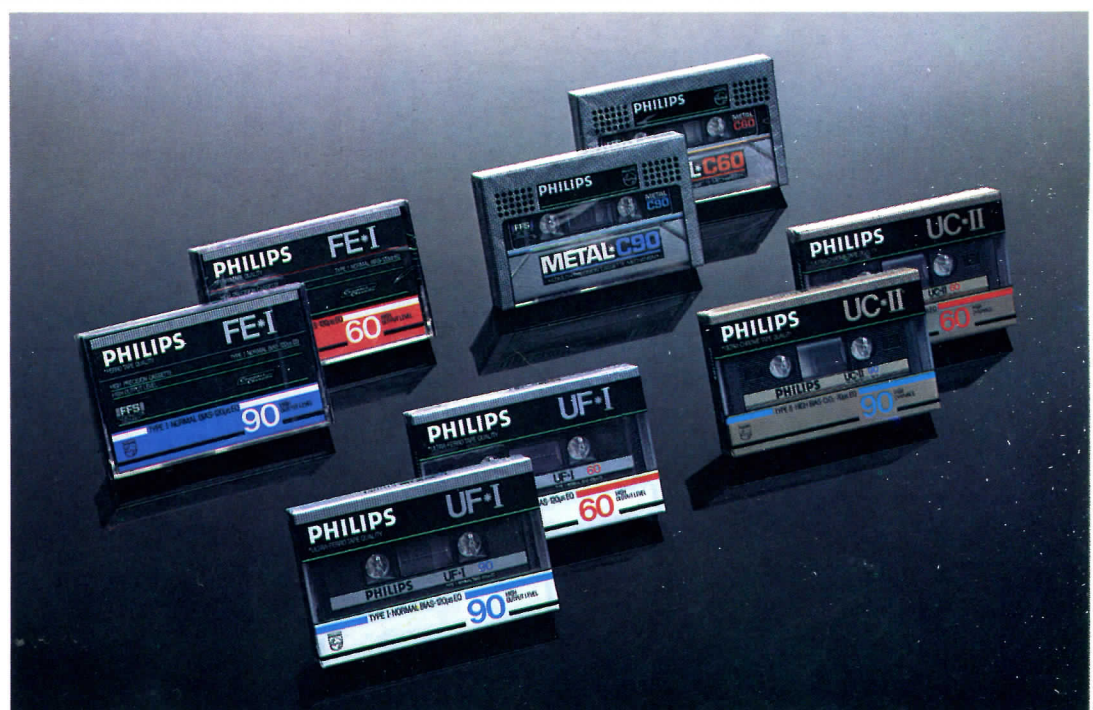
FE: A Type 1 cassette with high output and low noise ideal for use with the average cassette recorder.

UF: An outstanding Type 1 cassette which gives excellent results in radio recorders, in-car equipment and most music centres.

UC: A superior Type 11 cassette using "Crolyn" chromium dioxide crystals to stretch high frequency performance even further.

Metal: The cassette designed for the hi-fi professional. Coated with pure iron it brings the cassette deck into the reel-to-reel class. For perfectionists only.

A Masterchrome cassette offering exceptionally low noise levels with negligible azimuth error will be available from June. A brochure containing fuller specifications on the whole range of Philips cassettes is available from the address on the back page.



Component Guide

System	516	235	231	433	134	131	1530
PAGE NUMBER	8	9	10	11	12	13	14
AMPLIFIER	F4516	F4235 †	F4234	F4433	F4132 †	F4130	
OUTPUT POWER (IEC)	2x65W	2x50W	2x40W	2x30W	2x30W	2x25W	2x15W
LOUDNESS CONTROL	✓	✓	✓	✓	✓	✓	✓
HIGH FILTER	✓	✓					
LOW FILTER	✓	✓					
2 TAPE SOCKETS	✓	✓	✓	✓			
SWITCHING FOR TWO SETS OF SPEAKERS	✓	✓	✓	✓			
MICROPHONE INPUT	✓						
MC PICK-UP INPUT	✓						
RECORD PLAYER	F7511	F7235	F7230 †	F7430 †	F7230 †	F7130	
BELT DRIVE	✓	✓	✓		✓	✓	
QUARTZ SPEED LOCK	✓	✓					
FULLY AUTOMATIC	✓	✓	✓	✓	✓		
CARTRIDGE	GP401	GP331	GP330	GP330	GP330	GP330	GP330
ELLIPTICAL STYLUS	✓	✓					
INTERCHANGEABLE HEADSHELL	✓						
TANGENTIAL				✓			
TUNER	F2516	F2235	F2233	F2434	F2133	F2131	
DIGITAL TUNING	✓	✓	✓	✓	✓		
SLIDING STEREO DECODER		✓	✓		✓	✓	
SIGNAL STRENGTH IND.	✓	✓					
PRE-SET STATIONS	29	47	47	12	12		
NON-VOLATILE MEMORY	✓	✓	✓	✓			
CASSETTE RECORDER	F6622	F6335 †	F6233	F6430	F6133 †	F6133 †	
SOLENOID OPERATED	✓	✓					
FSX REC/PB HEAD	✓	✓	✓	✓	✓	✓	
AZTEC AZIMUTH SYSTEM		✓					
DOLBY* B	✓	✓	✓	✓	✓	✓	✓
DOLBY* C	✓	✓					
NEXT TRACK BUTTON	✓						

† AVAILABLE AS A SEPARATE COMPONENT *TRADE MARK OF DOLBY LABORATORIES

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