



HI-FI VIDEO 1985-86

INTRODUCTION

DIGITAL MONITORING

A revolution is underway. A revolution that will change our leisure time and enhance our lives.

Reproduced music has been with us for well over 100 years. In that time techniques of reproduction have developed from crude mechanical systems through electrical recording to high-fidelity amplification, stereo and the microgroove LP. The world-wide pop music explosion in the 60s ensured that by the 70s every home would have equipment capable of reproducing sounds unheard of outside professional studios only a decade before.

Since the advent of cinema, picture and sound quality have advanced hand-in-hand. Behind the scenes the audio and cinema worlds have been close, often sharing techniques and ideas. Today's cinema goers rightly expect both the high quality picture that 70 mm film can give and the "involvement" of a noise-free sound track presented not only in stereo but in surround sound.

A late-comer in the entertainment race has been Television. The fastest developer, video can now offer the quality and excitement of cinema sound tracks in the home.

MARANTZ has seen this crossroads in home entertainment and has engineered a range of related components which offer the highest quality home entertainment.

The Digital Monitoring range of hi-fi components provides the highest audio quality; the MARANTZ video recorders offer the excitement of VHS Hi-Fi, Stereo and now the possibility of Dolby Surround. Hi-Fi and Video at last come conveniently together through the application of digital technology.

A truly integrated home Audio-Visual system is now reality with the MARANTZ AV BUS system : an interactive digital communications link from hi-fi components to video, all with the possibility of true full-function remote control. The revolution is about to happen in your living room !

DIGITAL MONITORING PHILOSOPHY

MARANTZ never forgets that the audio world technology is the servant of music. Naturally in building our range of components we have used every trick and technique today's technology can provide. Each choice is determined not by mere technicalities but by what MARANTZ considers the ultimate test-listening.

If you talk today about hi-fi you cannot help but talk about "digital". Digital sound engineering can now capture and reproduce a sound far closer to the reality of the concert-hall or studio than ever before. Digital audio, Compact Disc in particular, has stimulated new ideas in audio technology. Conventional techniques have been found lacking.

To reproduce the ultra-wide dynamics of digital, its truly wide frequency response, its high information content and potential for superb stereo imagery, MARANTZ has produced a range of "Digital Monitoring" components designed to get the best from today's high quality digital material. Technology advances rapidly.

MARANTZ has ensured that you will not miss out on even tomorrow's developments — CD graphics, video surround sound, and satellite broadcasts.

AV BUS SYSTEM

Conventional remote linking systems require every component to be individually connected to the controller—you might just find enough sockets to connect up a disc/tape/radio/DC system but try to add video tape and discs and you'll soon run out of connections.

The MARANTZ solution is the AV BUS. The BUS is a data transfer system similar to those used in computers. Each component is connected to the last in line — only the signals for the tuner, for example, affect the tuner because the control signals are digitally coded.

The AV BUS means that you need never run out of sockets to connect a new piece of equipment. This gives you unlimited scope to expand and develop your home entertainment system at will. There is no interference between different units and one remote control handset will do for all the equipment you want to buy.

Whether you are attracted to the MARANTZ Midi Series or to the Digital Monitoring components the AV BUS technology is there for your use.

CONVENTIONAL AUDIO

MARANTZ has not forgotten the traditional values. In designing this range of new components our engineers have looked in the greatest detail at materials and techniques always with the aim of offering you a better quality product.

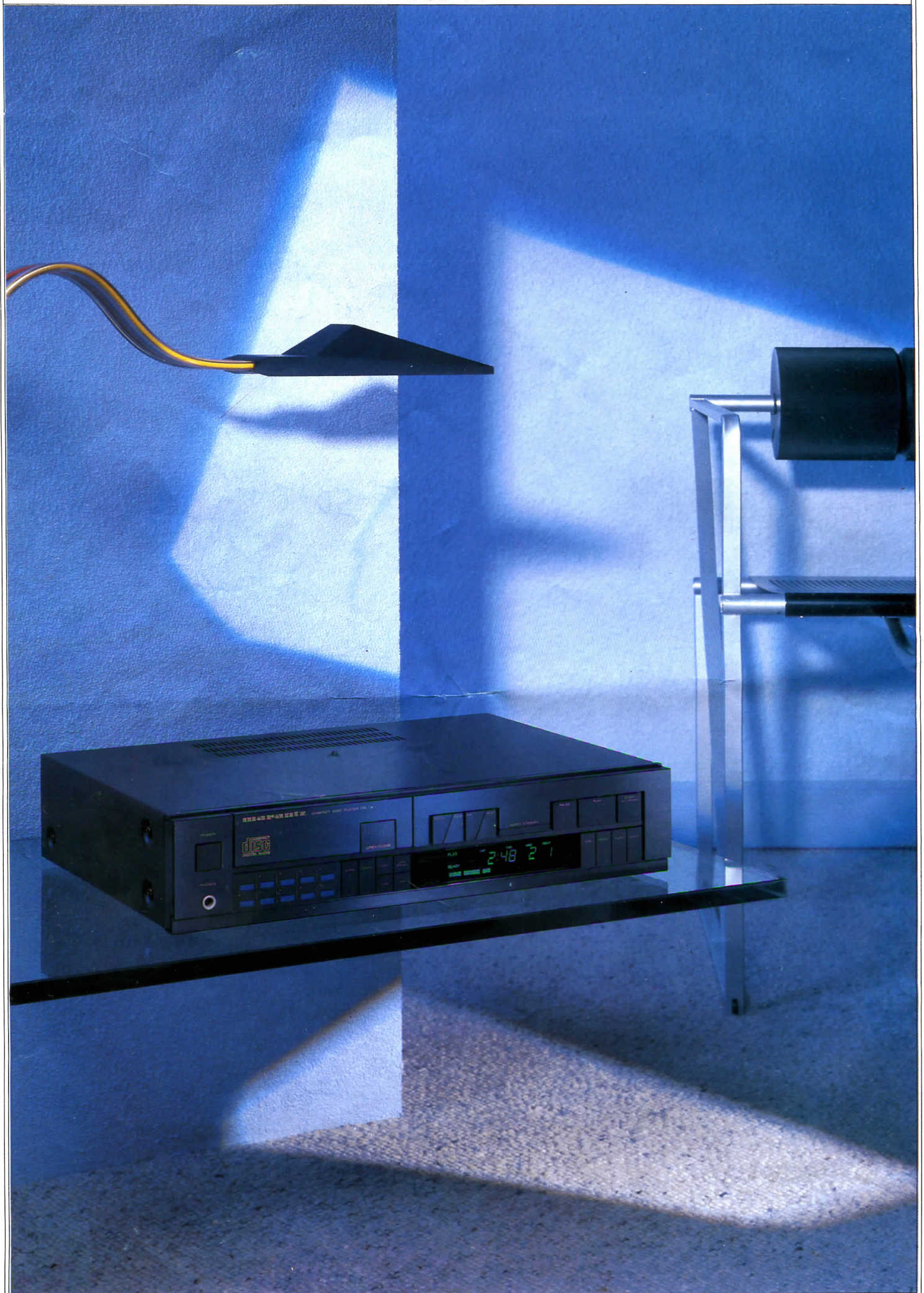
For example, not satisfied with the performance potential of the power chips used in the average budget amplifier when driving real loudspeakers, MARANTZ engineers have chosen to use discrete power transistors to give even the budget amps a 'real world' performance and not just a tidy specification on a test bench.

Every choice made between components or materials is made according to rigorous scientific principles — only then does the listening begin. Our engineers know that every component has its own sound quality character — the capacitors and resistors we use are chosen because of their sound quality. Our reference is master tape — the most neutral sound possible is the goal. A range of components is gathered and selection begins using the most stringent engineering standards.

Only components which measure-up get through to the listening tests where components are substituted in a working circuit until the right sound is revealed. It is not a quick job — after the circuit designs of the MARANTZ SC-11 preamp were completed it took nearly another year of listening to choose the right combination of components.

MARANTZ has developed techniques which would surprise even the hardened audiophile. Our listening tests revealed the importance of using the highest quality oxygen-free copper (OFC) cable to connect the output stage to the speaker terminals. For example, the PM-94 uses a cable of only 13.7 ohms per kilometre — chosen by listening.

MARANTZ



COMPACT DISC

COMPACT DISC

Compact Disc is the most exciting development in audio since the advent of the stereo LP. The players combine superior sound quality (wide dynamic range and frequency response, low distortion on peak signals and wide stereo separation) with the convenience of track selection and automatic search/play. The discs themselves carry the digital information inside a protective layer of acrylic. Error correction circuits inside the player can correct for disc manufacturing faults or for subsequent damage giving you a sound free from snaps, crackles or pops.

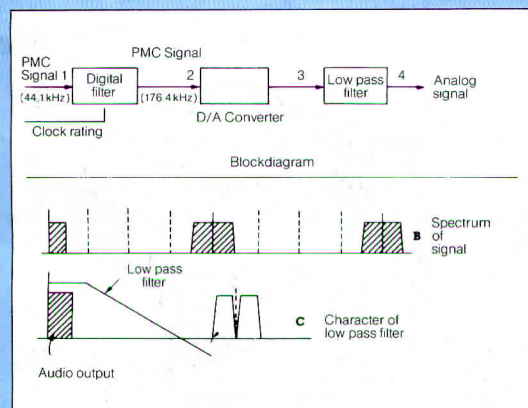
"Z" FILTER TECHNOLOGY

The digital signal from the disc is converted into an audio signal in the last stages of the player in the digital-to-analogue (D/A) convertor. The critical part of the D/A convertor is the low-pass filter — MARANTZ players use an all-digital filter unlike many other players which use complex and problematic analogue filter circuits.

In the filter the sampling frequency of 44.1 kHz is quadrupled to 176.4 kHz. The convertor is therefore going to produce harmonics (distortion) of this tone instead of the original frequency, this helps reduce the audible "in-band" distortion. Distortion is moved upwards in frequency and so a filter with a far less steep slope can be used — which means less filter "ringing". This technique is known as "oversampling" and is used in all MARANTZ CD players.

NEW 16-BIT DIGITAL-TO-ANALOGUE CONVERTOR

Previously MARANTZ has successfully been using the TDA-1450 chip which offers full 16-bit resolution when used with the combined digital filter/3rd order Bessel filter described above even though it is a 14-bit chip.



"Z" filter diagram.

The recognizable quality of MARANTZ CD players has stemmed from this combination of digital filtering and noise shaping based on the TDA-1450. A new generation of full 16-bit chips will be used in the new generation of MARANTZ CD players.

Unlike conventional 16-bit models which have been on sale from Day One the new D/A convertor will be used with all the oversampling and filtration techniques which have marked MARANTZ CD players out from the rest of the field. This combination will give the players a wider dynamic range than is ever recorded in the studio! MARANTZ original 14-bit with oversampling technology received unanimous critic approval for superior sound quality compared to the conventional 16-bit models.

Comparison of the old LSI (Large Scale Integrated) with the new 16-bit LSI shows even tighter channel balance, deviations in frequency response held to one-fifth of the previous specification, at least 5 dB more dynamic range and improvements in all distortion parameters.

MARANTZ CD players have always incorporated a light-weight laser pickup mounted on a swing arm in a heavy chassis. This combination helps in tracking disc eccentricities and reduces the work done by the tracking servo which all improves sound quality.

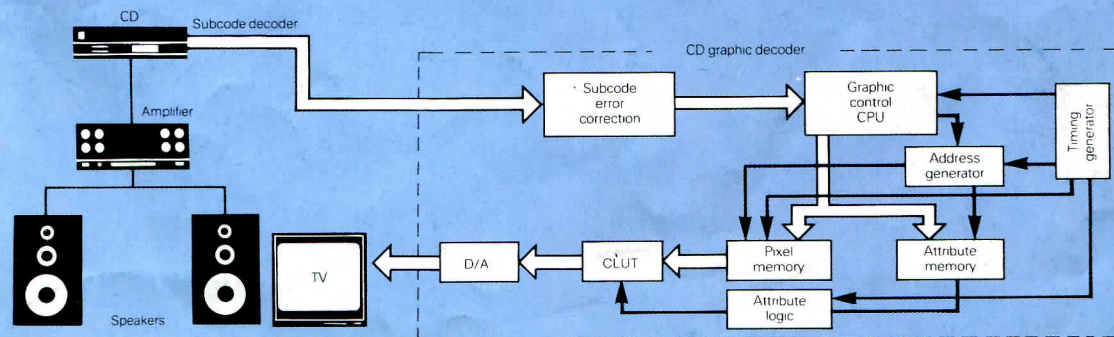
Following the same design philosophy, the optical pickup is as simple as possible and uses specially developed laser diodes. The simple lens and reflector assembly ensure low-mass, reliability and precision.

CD IN THE FUTURE

The technology behind CD makes the format ready for future data storage applications. Today's Compact Discs carry sub-codes written in 8-bit code. These codes are called P, Q, R, S, T, U, V and W. As yet only the P and Q channels are used to store track time and index information. The remaining channels can be used to store graphics. With a suitable demodulator between the CD player and TV still pictures of medium resolution with a shade card of over 40,000 hues can be presented once every 15 seconds. An international standard will soon be agreed. For the moment MARANTZ is making certain that anyone investing in a MARANTZ CD player has an appropriate output for such future uses.



16 BIT D/A Converter



CD graphics block diagram.

DIGITAL
MONITORING
Z FILTER



2/16 Bit DAC
Digital Filter
Digital Output
Multifunction Display
Time and Index
Programmable
Remote Controlled

BUS

CD-84 II



Full 16-bit oversampling CD player with Infra-red remote control (PLAY, STOP, PAUSE, REPEAT, MUSIC STANDBY, BACK TRACK, NEXT TRACK and MUSIC SCAN) and separate power supplies for digital and analogue circuits.

Features

- Z filter with twin 16-bit D/A convertor for flatter frequency response, wide dynamic range, low distortion and no phase error.
- Die-cast sub-chassis with fully floating laser pickup on swing arm for tracking stability.
- Total tracks and total time readout as disc is loaded.
- Display of remaining and elapsed time.
- Keypad allows direct Track entry for quick Track selection
- Random access memory for up to 24 tracks allows replay of your own selection of tracks and replay order.
- Programming can be by Track, Index or by Time, with or without Track, Program or A to B repeat.
- Auto music scan (AMS) plays the first 10 seconds of each track for quick searching.

- Forward and backward track skip for searching.
- Fast forward and backward search.
- Music Standby sets the player to pause at the beginning of a track after search or at the start of a chosen track.
- Repeat for all or selected tracks or between two programmed times.
- Clear display of program and operational status.
- Synchro start for synchronized tape recording.
- Digital output for CD graphics and future developments.
- Two-way remote control; CD-84 II is supplied with its own IR remote yet can be used with BUS.
- Available in black or gold finish.

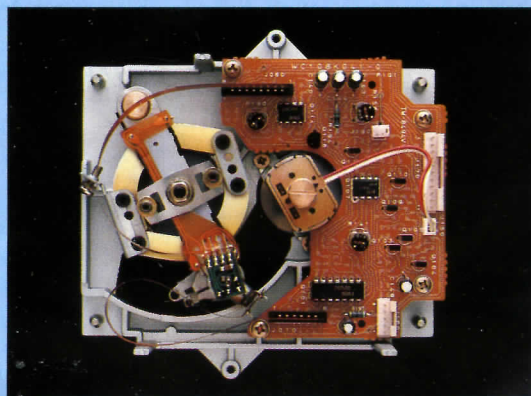


Available early 1986

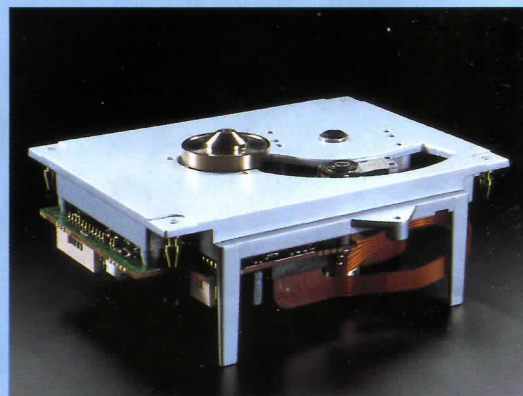
CD players are not affected in the same way as turntables by vibrations in the environment. While their servos can keep the laser tracking the disc even under difficult conditions it is not advisable from the point of view of highest possible sound quality to run a CD player in this way. A correlation between good shock-resistance, feedback isolation and sound quality has been noted by audiophiles the world over.

MARANTZ engineers have investigated the effects vibrations have on the servos and have come up with a shock absorbing 'floating' sub-chassis to increase the effectiveness of the servo circuits. Taking into account the disc

compliance a frequency of 10Hz has been chosen for the floating sub-chassis resonance; the Q damping of the system has been carefully adjusted using springs and isolating rubber washers. Improved sound quality results from a simple yet effective engineering technique. Fully aware of the various modifications made to standard CD players by respected audiophile companies MARANTZ has decided to offer separate power supplies in the CD-84 II and CD-65. Servo circuits demand a lot of current and to prevent intermodulation distortion in the audio circuits it has been decided to separate the high current circuits and give them their own power supply.



Laser pick-up subchassis (rear view).



Laser pick-up chassis.

CD-65



The CD player for the discerning listener with twin 16-bit DACs and oversampling improved acoustic isolation and separate power supplies.

Features

- Z filter with twin 16-bit D/A convertor with oversampling for flatter frequency response, wide dynamic range, low distortion and no phase error.
- Fully floating sub-chassis to neutralize acoustic feedback; laser pickup on swing arm for tracking stability.
- Separate power supply for digital and analogue circuits to reduce distortion.
- Display of remaining and elapsed time.
- Direct access to 99 tracks for quick Track selection.
- Random access memory for up to 20 tracks allows replay of your own selection of tracks and replay order.

- Forward and backward track skip for searching.
- Music Standby sets the player to pause at the beginning of a track after search or at the start of a chosen track.
- Repeat for all or selected tracks or between two programmed times.
- Variable speed forward and backward search with sound.
- Clear display of program and operational status.
- Synchro start for synchronized tape recording.
- Digital output for CD graphics and future developments.
- Headphone output with variable level.
- BUS capability.
- Available in black or gold finish.

2/16 Bit DAC
Digital Filter
Digital Output
20 Track programming
Floating Mechanism.

BUS

CD-45



High value for money full function compact size component CD player, including connectors for the unique BUS remote control system. 320 mm wide.

Features

- Z filter with twin 14-bit D/A convertor with oversampling for flatter frequency response, wide dynamic range, low distortion and no phase error.
- Fully floating sub-chassis to neutralize acoustic feedback; laser pickup on swing arm for tracking stability.
- Display of remaining and elapsed time.

- Direct access to 99 tracks for quick Track selection.
- Random access memory for up to 20 tracks allows replay of your own selection of tracks and replay order.
- Forward and backward track skip for searching.
- Variable speed forward and backward search with sound.
- Repeat for all or selected track(s).
- Clear digital display of time and track selection.
- Synchro start for synchronized tape recording.
- BUS capability.
- Available in black finish.

2/14 Bit DAC
Digital Filter
20 Track programming
Floating Mechanism.

BUS



AMPLIFIERS

The PM-94 is a new top-flight integrated amplifier (=amp) from MARANTZ which incorporates many of the advanced techniques pioneered by our engineers in the Esoteric Technology Amplification components. The chassis for instance is fully shielded from induced electromagnetic currents by being made of thick copper-plated sheet. The highest quality components are used throughout. Facilities like sophisticated tape dubbing are offered yet their convenience does not jeopardize ultimate sound quality as these facilities can be by-passed.

MOSFET (Metal Oxide Semiconductor Field Effect Transistors) have been chosen as the power devices for the PM-94 as they are far more linear than conventional transistors showing lower distortion and a wider, flatter frequency response. Because of the inherent linearity of these devices little negative feedback is required to achieve a flat wide-band response and this in turn means better transient performance—these FETs can switch an astonishing 1 Amp in one ten millionth of a second!

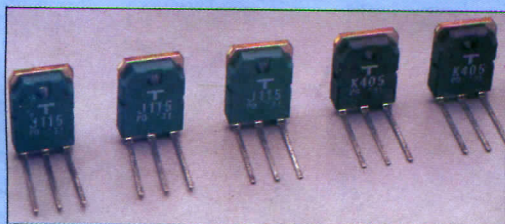
The PM-94 has effectively two independent power supplies, in Class A the amplifier can draw on a massive reservoir of 27,000 μ F of capacitance.

140W per channel into 8 ohms load across full audio bandwidth for only 0.01% Total Harmonic Distortion. 280W per channel dynamic power (IHF) into 4 ohms.

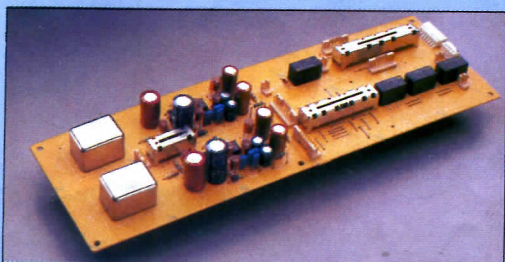
Features

- Quarter A technology offer high dynamic power coupled with pure Class A sound.
- Uses power MOSFETs for even lower distortion, wider frequency response and better transient response.
- Low impedance drive capability to give the best possible reproduction with a wide range of loudspeakers.
- Thick copper-plated chassis eliminates distortion from electromagnetic coupling in metalwork; lower noise.
- CD Direct and Tone Defeat positions for Compact Disc monitoring to the very highest "straight path" standards.
- Custom-built oversize power supply capacitors for higher resolution and wide dynamic range.
- Torroidal power transformer for high efficiency with low stray radiation.
- Independent ground lines for left and right channels for improved stereo separation (over 70 dB at 10 kHz).
- Connections for Video Tape recorder allow high quality monitoring of video sources.
- Moving coil transformer input for better signal to noise performance.
- Special low impedance RIAA circuitry improves phono signal-to-noise ratio.
- All sockets are gold-plated for longevity and good electrical contact.
- Preamp-out, Power amp-in sockets for versatility.
- Full tape monitoring on three tape circuits (Tape 1, Tape 2, and VTR).
- Relay controlled speaker switching between two pairs of speakers - substantial binding posts.
- Available in black finish.

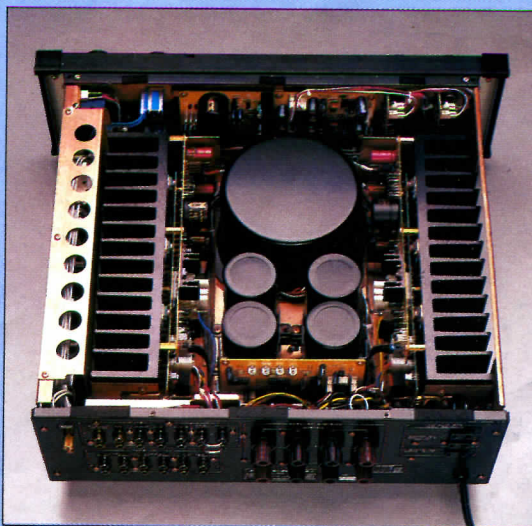
**2x140W 8 ohms FTC
MOSFET POWER STAGE
QUARTER A
Low impedance Drive
MC transformer
Copper plated chassis**



Mosfet's



MC Transformer



PM-94 Inside view

**DIGITAL
MONITORING**

Quarter A



TECHNOLOGIES IN THE PM RANGE

QUARTER A

Quarter A allows pure Class A operation up to one quarter the maximum amplifier output power. Above this limit the amplifier shifts to conventional AB amplification. This combination offers all the subtlety and sweetness of Class A amplification for low level signals yet allows a headroom potential for the spectacular dynamic peaks found in well-recorded digital material.

The high temperature running commonly associated with Class A is avoided by careful control of the bias current which is dependent on the power output demand and switches in three stages from 0 to 5, from 5 to 30 and above 30 Watts.

AVSS (Automatic Voltage Shift Supply)

Models in the PM range use this innovative circuit to enable them to respond instantaneously to the power demands of wide dynamic range typical of digital recordings. AVSS controls the output voltage of the power supply and provides an appropriate voltage for the output circuitry corresponding to the output of the power transistors.

COMPONENT SELECTION AND CIRCUIT DESIGN

MARANTZ understands that every component has not only a loss factor associated with it but an additional factor corresponding to its sound quality characteristics. From the outset components are screened by our engineers so a range of components of minimum information loss can be auditioned for their sound quality.

MARANTZ power supply capacitors for example are made to the company's own specification to optimize the speed of charging and discharging which is directly related to the energy delivery potential which can have a fundamental bearing on the "tightness" of bass from the finished amp.

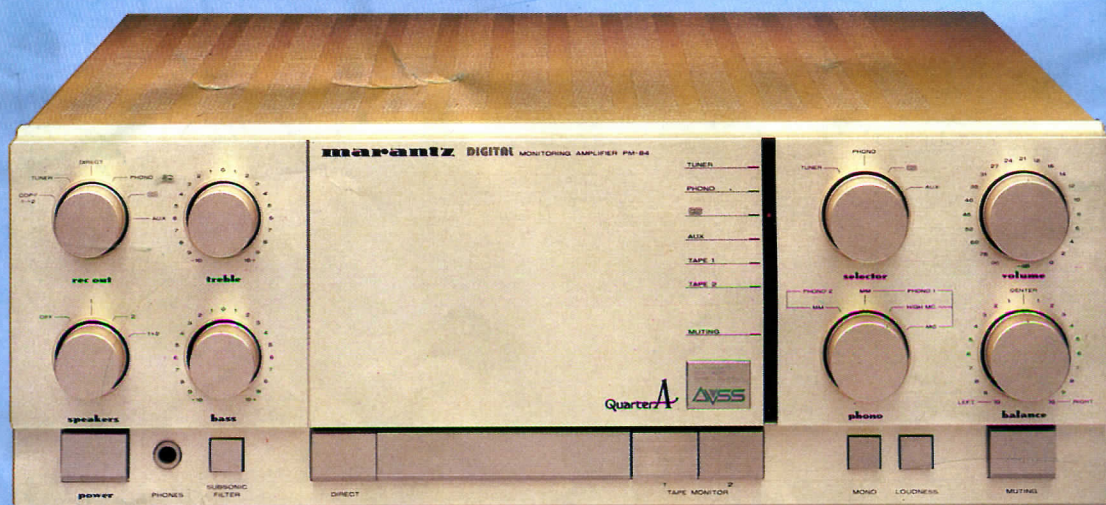
It is now well known that different components have their own best operating temperatures and MARANTZ engineers design their circuits to enable power supply capacitors to be near other 'hot' components - such attention to detail produces an amplifier that gives its best irrespective of ambient temperature and which shows no modulation distortion with the cyclic heating of components under music drive.

In the circuit layout great care is taken over the arrangement of grounds to check unwanted current flows which otherwise can produce a type of intermodulation distortion. Computer designed PCBs with varying track widths are now in use in MARANTZ amplifiers to selectively control the current flows. The choice of impedance of the copper tracks of the circuit board for instance can be used to 'deflect' the back EMF signal from the speaker - a 'return' signal from the loudspeaker voice coil which can have a dramatic and deleterious effect on sound quality in less well-designed amplifiers.

PM-84

DIGITAL
MONITORING

Quarter A
AVSS



2x302W IHF 4 ohms
Dynamic Power
2x120W 8 ohms FTC
Quarter A
AVSS
Low Impedance Drive
2 MC positions
Plastic Volume pot.
Direct Switch
Record Selector.

A high power integrated amplifier with flexible and comprehensive input/output options yet retaining the Direct position which allows direct connection of sources to the power amp via only the volume control.

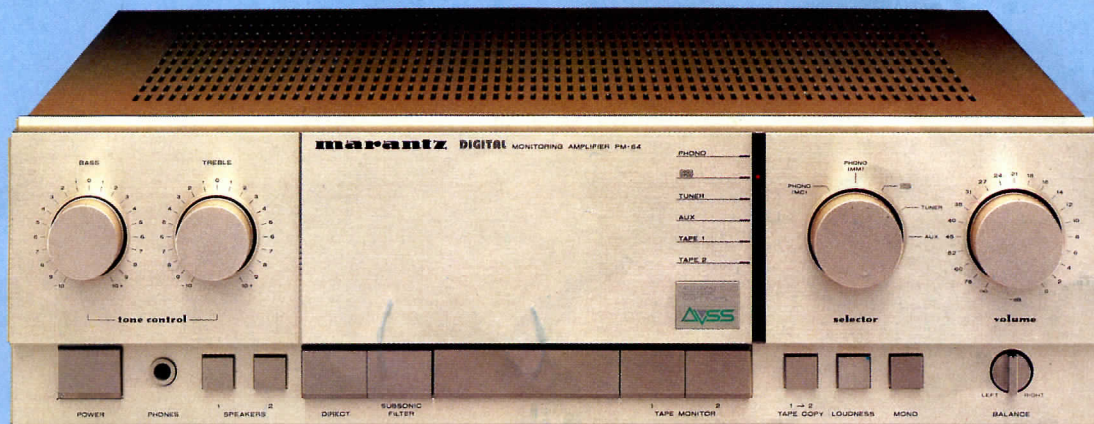
120W per channel into 8 ohms load across the full audio bandwidth for only 0.015% Total Harmonic Distortion. 302W per channel dynamic power (IHF) into 4 ohms.

Features

- Quarter A and AVSS technologies offer high dynamic power coupled with pure Class A sound.
- FET phono section for low noise, low distortion and low colouration - gold-plated connectors. (Frequency response to IEC spec.)
- Moving coil input offers two sensitivities.
- Copper-plated chassis reduces distortion from electromagnetic coupling in metalwork; lower noise.

- Direct switch bypasses all controls other than volume to allow input directly to power amp circuitry for the very highest standard of reproduction.
- Custom-made components reflecting MARANTZ dedication to the best sound possible. Conductive plastic volume control offers highest possible sound quality in Direct mode.
- Low impedance drive capability to give the best possible reproduction with a wide range of loudspeakers.
- High-speed power amp design for performance on demanding dynamic swings in digitally reproduced material.
- Two tape monitoring circuits with Record Output Selector to listen to one source while recording another.
- Switchable audio muting and subsonic filtering.
- Relay controlled speaker switching between two pairs of speakers - substantial binding posts.
- Available in black or gold finish.

PM-64



An integrated amplifier of well above average power for its place in the market. Incorporates the copper-plate shielding and AVSS techniques of the PM-94 and PM-84. 100W per channel into 8 ohms load across the full audio bandwidth for only 0.03% Total Harmonic Distortion. 229W per channel dynamic power (IHF) into 4 ohms.

Features

- AVSS technology improves the dynamic power delivery for the demands of CD reproduction.
- Low impedance drive capability to give the best possible reproduction with a wide range of loudspeakers.
- FET phono section for magnetic and moving coil car-

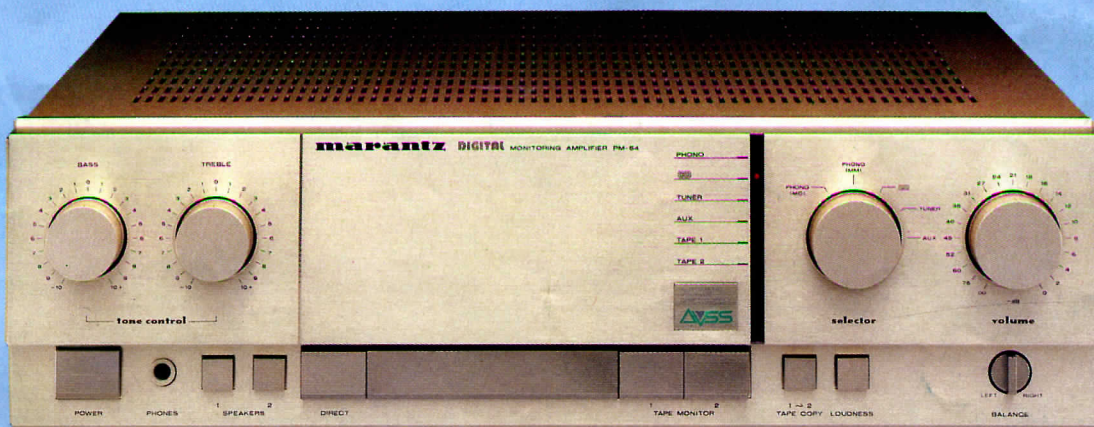
tridges offers low noise, low distortion and low colouration — gold-plated connectors.

- Direct switch bypasses all controls other than high-quality volume control to allow input directly to power amp — eliminates the colouration inherent in tone control and filter circuits.
- Custom-made components for the best sound possible.
- Six audio inputs for convenience and flexibility.
- Tape monitoring and dubbing for two tape decks.
- Relay controlled speaker switching between two pairs of speakers.
- Mono switch (PM-64 only).
- Available in black or gold finish.

**2x 229W IHF 4 ohms
Dynamic Power
2x 100W 8 ohms FTC
AVSS
Low impedance Drive
MC/MM FET Inputs
Direct Switch**

**DIGITAL
MONITORING
AVSS**

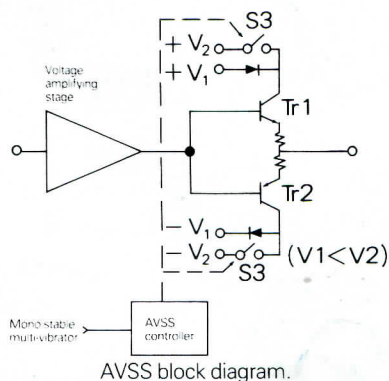
PM-54

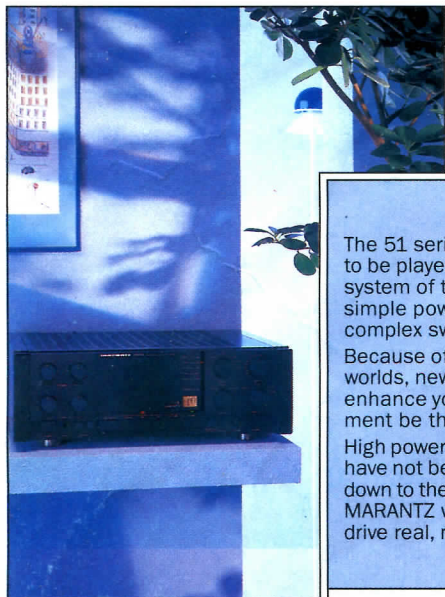


60W per channel into 8 ohms load across the full audio bandwidth for only 0.03% Total Harmonic Distortion. 180W per channel dynamic power (IHF) into 4 ohms. All the qualities and features of the PM 64 in a less power-full package. Available in black or gold finish.

**2x 180W IHF 4 ohms
Dynamic Power
2x 60W 8 ohms FTC
AVSS
Low impedance Drive
MC/MM FET Inputs
Direct Switch**

**DIGITAL
MONITORING
AVSS**





The 51 series takes a fundamentally new look at the role to be played by amplifiers in the integrated audio/visual system of tomorrow. No longer can an amp be seen as a simple power amplifying device, it has now to fulfill complex switching functions for audio and video signals. Because of the growing together of the audio and video worlds, new features are provided on these amplifiers to enhance your enjoyment of high quality home entertainment be that through Hi-Fi Video or Compact Disc. High power output and audiophile inspired circuit design have not been left out - discrete transistors are used right down to the least expensive amplifier in the range because MARANTZ will not compromise the ability of an amp to drive real, not just test, loads.

This equipment is designed to be at home dubbing your own sound track onto video tape from video disc or TV sources as it is happy to be the centre of a true high-quality audio system handling the dramatic and exciting sound from Compact Disc.

Special features for the combined Audio-Visual role amplifiers will have to play in the future are offered in this range now. Spatial stereo, featured on the PM-551 and PM-451 amplifiers, allows mono TV sound to be enhanced for replay through the stereo loudspeakers of a quality hi-fi system. Sound injection lets sound effects or music be transferred from any source onto video tape.

PM-551 / (PM-451)



PM-551

2x205 IHF 4 ohms
Dynamic Power
2x110 W DIN 8 ohms
AV/BUS Remote Control
7 Audio 3 Video Inputs
AV Surround IN/OUT
5 Band EQ
Electronic Volume
Low impedance Drive.

PM-451

2x125 W IHF 4 ohms
Dynamic Power
2x70 W DIN 8 ohms
AV/BUS Remote Control
7 Audio 3 Video Inputs
AV Surround IN/OUT
5 Band EQ
Electronic Volume
Low impedance Drive.

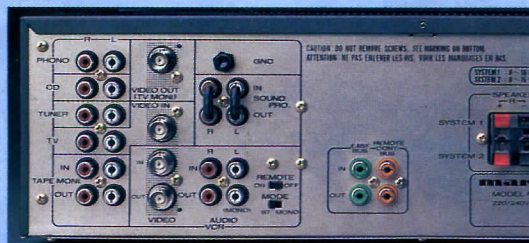
High power audio/video amplifier with sophisticated switching for up to ten sources. With graphic equalizer and AV BUS capability.

110 W per channel into 8 ohms load across full bandwidth for only 0.05% Total Harmonic Distortion. 205 W per channel dynamic power (IHF) into 4 ohms.

Features

- High dynamic power capability for reproduction of wide range CD dynamics.
- Remote control capability with the AV BUS.
- Enough inputs to operate a complete audio/video system (7 audio sources and 3 video).
- Video Monitor switch to monitor sound and pictures while recording onto video tape.

- Independent video selection to record sound and pictures from TV, Video Disc onto video tape.
- Tape/VCR copy switch allows transfer of sound track from VCR to tape and back.
- Extra AV input on the front panel for convenient hook-up of external video.
- Spatial stereo features to enhance mono TV sound.
- Sound Injection allows sound effects for music to be transferred from any source to video tape.
- Five-band graphic equalizer to modify the sound balance of any source.
- Electronic volume control with muting and two memory presets for convenience.
- Twin speaker system switching also offers special effects from 4 speakers.
- AV Surround In/Out sockets can be used for creating surround sound effects in conjunction with the RV-55 Digital Sound Processor.
- Available in black or gold finish.



PM-551 rear view

PM-451: 70 W per channel into 8 ohms load across full audio bandwidth for only 0.05% Total Harmonic Distortion. 125 W per channel dynamic power (IHF) into 4 ohms. The PM-451 has the qualities and features of PM-551 in a less powerful package.

DISCRETE TRANSISTORS

Rather than use the Integrated Circuit power amplifier blocks chosen on price grounds by its many competitors MARANTZ has stuck firmly by discrete power transistor designs. This is to comply with our engineering standards which determine that even budget amplifiers shall be capable of driving low impedance loads — how else will an amp cope with a real loudspeaker?

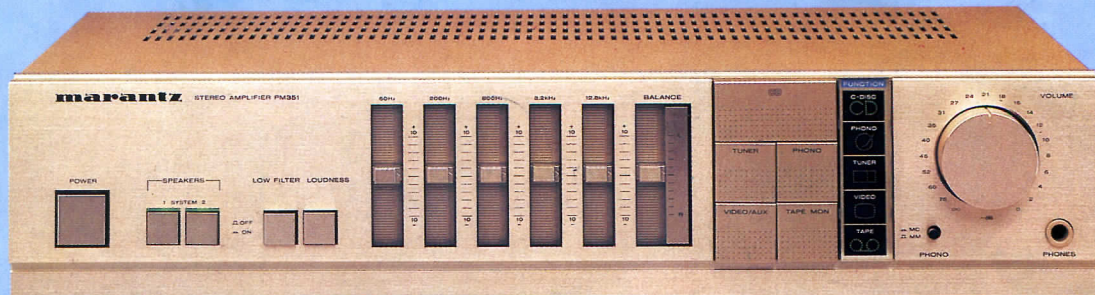
ICs of the type used in competing amplifiers contain internal current limiters which prevent the power ICs from

overloading yet also prevent them from adequately driving real-world loudspeaker loads! These ICs often contain safety circuitry which sacrifices the audio specification of the final amplifier. Additionally the high negative feedback required in using these ICs is alien to the MARANTZ way of thinking.

All amplifiers from the PM-551 down to the PM-151 use discrete power transistors which gives them robustness and high power capability into even difficult loads.

AVES

PM-351



High dynamic power amplifier with graphic equalization and comprehensive input options. Low impedance drive capability gives smooth, powerful sound and matches any speaker on the market.

60W per channel into 8 ohms load across full audio bandwidth for only 0.05% Total Harmonic Distortion. 120W per channel dynamic power (IHF) into 4 ohms.

Features

- High dynamic power capability for reproduction of wide range CD dynamics.
- Low impedance drive capability to give the best possible reproduction with a wide range of loudspeakers.

- Five-band graphic equalizer to modify the sound balance of any source.
- Discrete output transistors mean less aggressive, glare-free sound.
- Inputs for five sources including CD and video.
- Moving coil input for high quality mc cartridges.
- Twin speaker system switching also offers special effects from four speakers.
- Available in gold finish.

2x120W IHF 4 ohms
Dynamic Power
2x60W DIN 8 ohms
Low impedance Drive
5 Band EQ
5 Audio Inputs
Discrete power Outputs.

PM-251

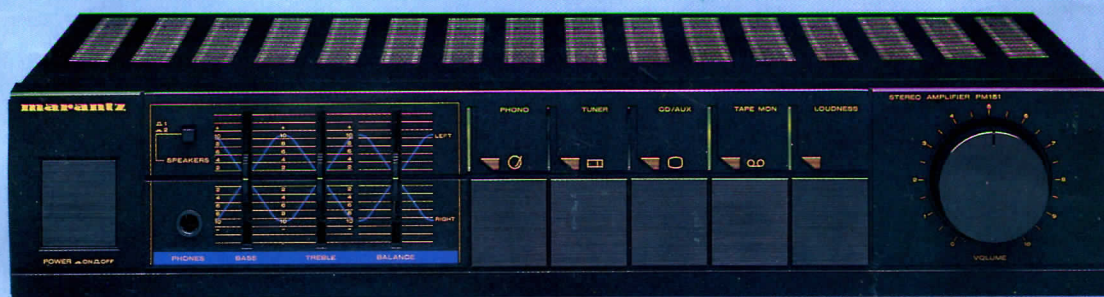


Offers all the features and facilities of the more expensive PM-351 for circumstances where highest power output is not essential. Available in gold finish.

50W per channel into 8 ohms load across full audio bandwidth for only 0.05% Total Harmonic Distortion. 84W per channel dynamic power (IHF) into 4 ohms.

2x84W IHF 4 ohms
Dynamic Power
2x50W DIN 8 ohms
Low impedance Drive
5 Band EQ
5 Audio Inputs
Discrete power Outputs.

PM-151



Budget amplifier using discrete output transistors capable of driving low impedance loads and delivering high dynamic power.

40W per channel into 8 ohms load across full audio bandwidth for 0.1% Total Harmonic Distortion. 69W per channel dynamic power (IHF) into 4 ohms.

Features

- High dynamic power capability for reproduction of wide range CD dynamics.

- Low impedance drive capability to give the best possible reproduction with a wide range of loudspeakers.
- Discrete output transistors mean less aggressive, glare-free sound.
- Inputs for four sources including CD.
- Two switchable speaker systems.
- Available in black finish.

2x69W IHF 4 ohms
Dynamic Power
2x40W DIN 8 ohms
Low impedance Drive
Discrete power Outputs.



ESOTERIC TECHNOLOGY

SC-11: Stereo preamplifier designed to complement the finest audio sources today. The entire amplification chain uses ultra-linear push-pull Class A circuits.

Crucial in obtaining flat, colouration-free sound from the finest stereo cartridges is a completely accurate RIAA equalization circuit in the phono stage to IEC specification. MARANTZ engineers have decided to adopt a dual active/passive equalization circuit to minimize the use of negative feedback and therefore improve transient performance.

The treble equalization on the pickup is achieved using a capacitor and resistor filter on the input — a totally passive "cut" applied to the input signal boosted during disc cutting.

Bass equalization is supplied by a negative feedback circuit which is in no danger of disc overload at these frequencies as would be a high negative feedback wide bandwidth design. Great demands are made of the signal-to-noise ratio of accompanying circuitry by the use of this technique but the stringent choice of components specifically for low noise ensures a superior RIAA section with low noise, low distortion, flat response and zero colouration.

The finest quality moving coil cartridges can be accommodated; there are connections for six sources including a "straight path" CD input and connections for two tape decks. The rear panel carries an output for an oscilloscope. Of course all sockets are gold-plated for least contact resistance and longevity.

Components have been carefully selected for low noise and low distortion performance. Low noise carbon film resistors are used on account of their neutrality but in critical circuits like the mc head amp of the SC-11 metalized film resistors of tight tolerance and of very low noise (1/10th that of a comparable carbon type) are used.

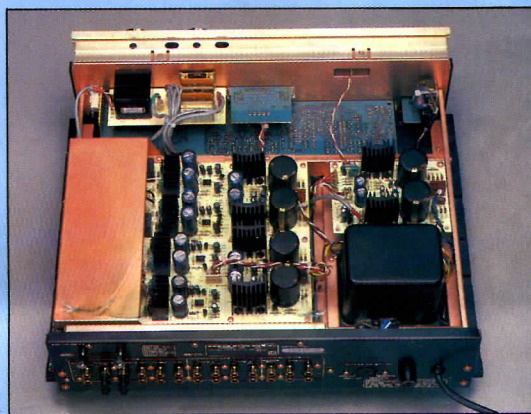
The Direct switch used in MARANTZ integrated amplifiers is featured in this preamp. This prevents the distortion and information loss which occurs routing a signal through unnecessary circuitry. The preamp source is connected

directly to the high quality conductive plastic potentiometer volume control which is itself connected directly to the power amplifier input.

Tone control circuitry follows the low negative feedback ideal to give accurate cut and boost and low noise.

Frequency response held to the tightest ± 0.25 dB limits from 20 Hz to 100 kHz for an incredibly low 0.002 % Total Harmonic Distortion. Signal-to-noise ratio of the phono mc stage is 92 dB and that of the CD input an unprecedented 115 dB.

ESOTERIC Pre-Amplifier
Super-Fi MC Amplifier
Push-Pull Class A Amps.
Professional Plastic
Potentiometers
Copper Plated Chassis
Full Gold Connectors.



SC-11 Inside view

SM-11: This 200W per channel amplifier is built to the highest possible standards. The output circuits use eight selected high-linearity transistors in parallel pairs to obtain reliability and a flat frequency response.

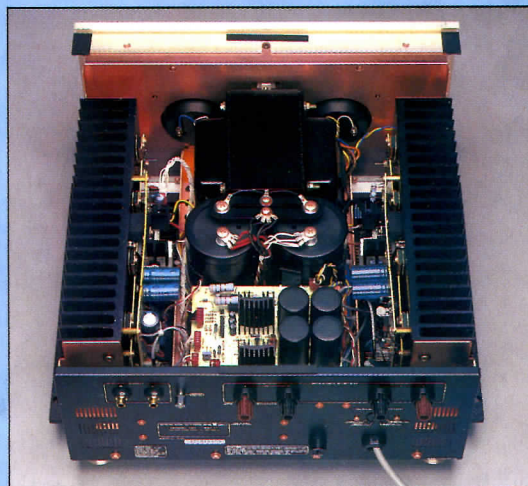
The power supply is an over-specified high-regulation type using specially developed ceramic-cored electrolytic capacitors.

Listening tests led MARANTZ engineers to even use solid brass or copper-plated screws in the construction to ensure that there was no electromagnetic induced distortion in unshielded components.

The changing flux around the massive transformer in such an amplifier causes a current to be induced in any magnetic material which is cut by the flux. This unwanted signal can cause intermodulation distortion and is eliminated by the use of impervious non-magnetic materials such as copper for the chassis, brass or copper-plated components. The effect is quite measurable in the improved high frequency noise performance of the copper chassis amplifiers.

In their choice of components MARANTZ engineers have even respecified the leg material of the transistors used in the Esoteric Technology range as in high current flow conditions even the material of this pin-sized structure is important — remember it may have to carry up to 10 Amps. 200W per channel into an 8 ohms load across full audio

bandwidth for only 0.008 % Total Harmonic Distortion. 392 W per channel dynamic power (IHF) into 4 ohms.



SM-11 Inside view

ESOTERIC Power Amplifier.
2x 392 W IHF 4 ohms
Dynamic Power
2x 200 W 8 ohms FTC
16 High Speed Power
Transistors
L/R Independent Power
Supply
Full Custom Made
components
Copper Plated Chassis.

The importance of a good tuner cannot be overestimated. Tuners are often the most frequently used hi-fi source. The quality of FM Stereo broadcasts is steadily improving, particularly with the advent of CD as a broadcast medium. Demands on tuner dynamic range and distortion performance are becoming greater and with digital station-to-station relays and satellite broadcasts becoming more common, tuners will be able to capture a quality of signal never before achieved.

The tuner must be able to capture and process the broadcast signal without distortion as it changes the information from a radio frequency to an audio signal which can be fed to a stereo amplifier.

Tuner front-end design is a difficult and complex area. The top-of-the-range ST-64 uses a front-end section comprising MOSFET coupled with twin varactor tuned stages. This has the advantage of high gain with low noise and has high sensitivity yet is resistant to saturation. This is especially

important in view of the very wide dynamic range of digitally sourced broadcasts.

As reception conditions vary widely from one location to another the ST-64 has a switchable IF bandwidth which allows you to isolate one station which is broadcasting close to another by using the NARROW setting yet you can enjoy the full modulation of more widely spaced stations and benefit from optimum stereo separation and even lower distortion when switched to WIDE.

A 1kHz Fine Tuning feature allows the very lowest distortion reception as the tuner can be selectively detuned to reduce cross-modulation distortion from another channel - a particularly useful feature for cable installations.

The IF filters used in the ST-64 are used throughout the range of MARANTZ tuners. These are specially designed, custom built ceramic filters which strike the correct balance between selectivity and distortion.



ST-64/16 (L)

**Quartz Synthesizer
Dual Gate MOSFET Front-
End
WIDE/NARROW IF Selector
Linear Phase IF Filters
16 FM/8 AM Presets.**

**DIGITAL
MONITORING**

BUS

A state-of-the-art digitally synthesized tuner with preset convenience and connections for BUS remote control. FM sensitivity 0.7 μ V, signal-to-noise-ratio 80dB, selectivity 70 dB (Narrow IF), 40 dB (Wide).

Features

- Quartz synthesized tuning for drift-free reception with preset and auto tune convenience.
- High sensitivity front end yet with low noise and low distortion to make the best out of high quality broadcasts.
- Switchable IF bandwidth to pick out stations under difficult

reception conditions or to achieve the best possible stereo separation and lowest distortion on less crowded bands.

- 16 FM and 8 AM presets for convenient, quick tuning — also memorize IF bandwidth setting.
- Fine tuning for reception of "out of standard" broadcasts from cable or crowded bands.
- Last station memory — tuner switches on with your favourite station.
- Memory backup in case of power failure.
- Program Record allows the tuner to switch between 6 stations for unattended recording.
- BUS remote control capability.
- Available in black or gold finish.

TUNERS

ST-551 (L)



High performance tuner with the emphasis on ease of operation.
FM sensitivity $0.9\mu\text{V}$, signal-to-noise ratio 78 dB, selectivity 60 dB.

Features

- Quartz synthesized tuning for drift-free reception with preset and auto tune convenience.
- High sensitivity front end yet with low noise and low distortion.
- Linear phase IF filters for high sensitivity yet with precise phase linearity and low distortion.

- 16 FM and 8 AM presets with indicators for convenient, quick tuning.
- Last station memory — tuner switches on with your favourite station.
- Memory backup in case of power failure.
- BUS remote control Infra red receiver and AV BUS command generator built in.
- Available in black or gold finish.

Quartz Synthesizer
16 FM/8 AM Presets
MOS FET Front-End
BUS/IR Receiver
Linear Phase IF Filters.

BUS

ST-251 (L)



High value for money tuner with many of the refinements of the top of the range models.
FM sensitivity $0.9\mu\text{V}$, signal-to-noise ratio 75 dB, selectivity 60 dB.

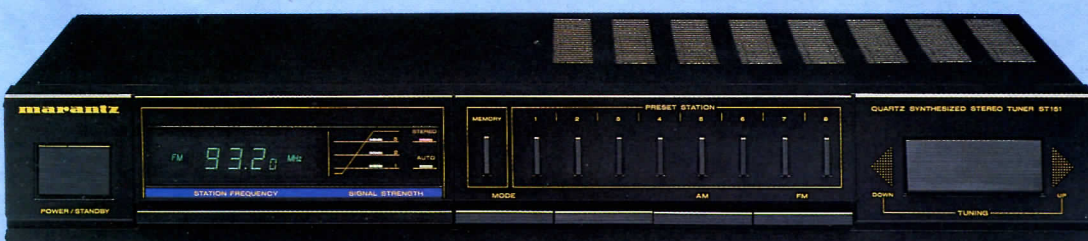
Features

- Quartz synthesized tuning for drift-free reception with 8 FM and 8 AM presets and auto tune convenience.
- High sensitivity front end yet with low noise and low distortion.

- Linear phase IF filters for high sensitivity yet with precise phase linearity and low distortion.
- Last station memory — tuner switches on with your favourite station.
- Memory backup in case of power failure.
- Available in gold finish.

Quartz Synthesizer
MOS FET Front-End
8 FM/AM Presets
Linear Phase IF Filters.

ST-151 (L)



Budget tuner with FET front end uses the same custom built IF filters as the most expensive model in the range. Features and functions are the same as the ST-251. Available in black finish.

FM sensitivity $1.0\mu\text{V}$, signal-to-noise ratio 70 dB, selectivity 60 dB.

Quartz Synthesizer
8 FM/AM Presets
Linear Phase IF Filters.



CASSETTE DECK TECHNOLOGY

Design techniques pioneered in the Esoteric Technology component range and work on Compact Disc player and amplifier power supplies have all been fed back into the new cassette deck range.

To reduce intermodulation distortion the high current circuits are provided with their own power supply in the top-of-the-range MARANTZ amplifiers and Compact Disc players. The same design philosophy has led MARANTZ engineers to adopt separate power supplies for the transport and audio circuitry in its up-market cassette decks — the low noise and distortion figures for these models show the advantages of this technique.

Auto reverse mechanism of cassette decks can improve usability but one of the major problems in providing auto reverse is in controlling the stability of the tape in forward and reverse directions. The superiority of the rotary head approach (rather than separate heads for forward and reverse) ensures that the same head gap is used in both directions and no variation in sound quality or alignment will result.

The rotating head mechanisms are produced from specially hardened materials to avoid deterioration due to wear. Head turn round is performed in an instant under the control of an optical sensor. Auto reverse operates during both record and replay which gives up to a full hour and a half recording or playback time with a C90 cassette. Great care is taken to design the tape path for balanced tension in both directions — for instance in the two-head SD-64 a dummy head is used to "balance" the drag on the tape in both forward and reverse directions. A Dynamic Stability Tension System guarantees constant back tension to ensure good tape to head contact and therefore an extended frequency response.

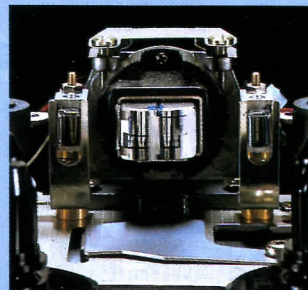
Three noise reduction systems are fitted to the top-of-the-range models. dbx is the only noise reduction system

which can offer 30 dB of noise reduction and the extra headroom necessary to appreciate digital's superior dynamic range and low noise.

dbx acts as a compressor during recording to bring the dynamic range within the capability of the tape. On replay the circuitry acts as an expander restoring the original dynamics but pushing the noise out of critical audible range.



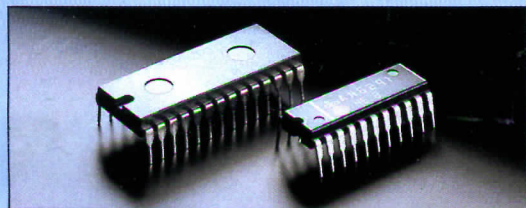
Flywheel Assembly



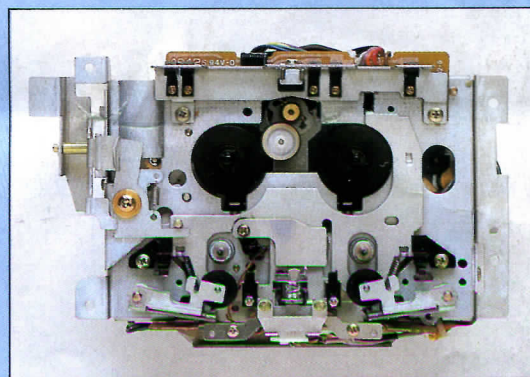
Rotary head assembly with 3 head configuration

DIGITAL
MONITORING

BUS



DOLBY IC and DBX IC



High precision mechanism

£ 2.89

SD-74

A full feature cassette deck with true tape monitoring and super fast auto reverse on both record and replay. Independent power supplies and careful component choice maintain MARANTZ tradition for marrying audio-ophile quality with convenience features.

Frequency response is 20Hz to 21kHz with metal tape. Signal-to-noise ratio 80 dB with Dolby C, 90 dB with dbx. Wow and flutter $\pm 0.05\%$.

Features

- Three motor logic controlled drive for low wow and flutter.
- Four head configuration for true monitoring in both forward and reverse modes.
- Opto-electronic super fast auto reverse mechanism with rotary heads on both record and replay for stable performance and maximum utilisation of tape.
- Independent bias circuit to optimize metal tape performance.

- dbx, Dolby B and C noise reduction systems for wide dynamic range recordings.
- Super hard metal alloy (SHMA) dedicated heads with carefully chosen gap widths for best record and playback response. Long life with metal tape.
- Dual gap erase heads for deep erasure of metal tapes.
- Peak hold fluorescent meter.
- Electronic real-time tape counter with remaining and elapsed tape time.
- Auto tape selection ensures best bias and equalisation is set every time.
- Synchro record input automatically starts recording at beginning of record.
- Equipped for BUS remote control.
- Timer standby and output level control from the front panel.
- Available in black or gold finish.

3 Motor Logic Mechanism
Quick Auto Reverse
Peak Hold FL Meter
Dynamic Back Tension Stabilizer
DBX/DOLBY B® + C®
Electronic Counter
BUS
4 head for true monitoring

239

SD-64



3 Motor Logic Mechanism
Quick Auto Reverse
Peak Hold FL Meter
Dynamic Back Tension
Stabilizer
DBX/DOLBY B^c + C^c
Electronic Counter
BUS.

DIGITAL
MONITORING

BUS

Based on the SD-74, the SD-64 offers all features and facilities of the more expensive machine in the two-head format.

Frequency response is 20 Hz to 20 kHz with metal tape. Signal-to-noise ratio 80 dB with Dolby C, 90 dB with dbx. Wow and flutter $\pm 0.05\%$.

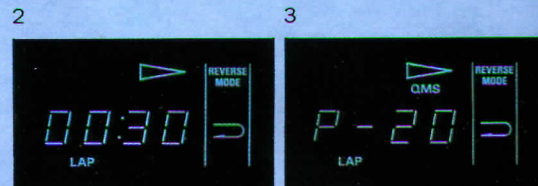
Features

- Three motor logic controlled drive for low wow and flutter.
- Opto-electronic super fast auto reverse mechanism with rotary heads on both record and replay for stable performance and maximum utilisation of tape.
- Independent bias circuit to optimize metal tape performance.
- dbx, Dolby B and C noise reduction systems for wide dynamic range recordings.

- Super Hard Metal Alloy (SHMA) head-long life with metal tape.
- Dual gap erase heads for deep erasure of metal tapes.
- Peak hold fluorescent meter.
- Electronic real-time tape counter with remaining and elapsed tape time.
- Auto tape selection ensures best bias and equalisation is set every time.
- Synchro record input automatically starts recording at beginning of record.
- Equipped for BUS remote control.
- Timer standby and output level control from the front panel.
- Available in black or gold finish.

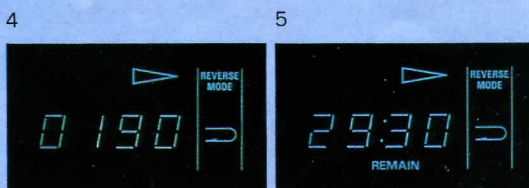


SD-74/SD-64 Multifunction display



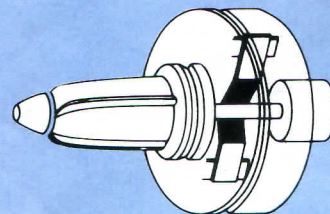
Counter display

Lap time display



Remaining time display

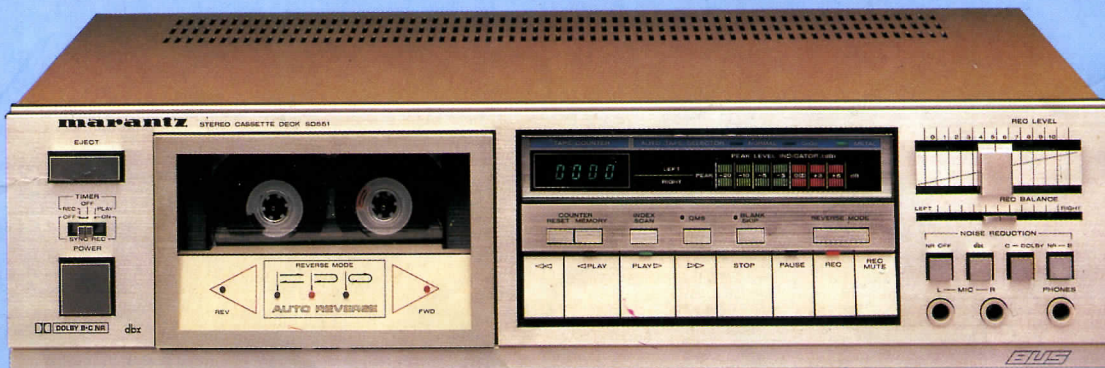
Music search display



Dynamic back tension shaft

E189

SD-551 / SD-451



High value deck with major features of the top-flight models — quick auto reverse on record and replay, micro-processor control of transport and three noise reduction systems.

Frequency response is 20Hz to 19kHz with metal tape. Signal-to-noise ratio 73 dB with Dolby C, 80 dB with dbx. Wow and flutter $\pm 0.07\%$.

Features

- Microprocessor logic controlled low wow and flutter mechanism.
- Super fast auto reverse mechanism with rotary heads on both record and replay for stable performance and maximum utilisation of tape.
- dbx, Dolby B and C noise reduction systems for wide dynamic range recordings.

- Quick acting LED level meter.
- Electronic four digit tape counter with memory stop.
- Super Hard Metal Alloy (SHMA) head-long life with metal tape.
- Dual gap erase heads for deep erasure of metal tapes.
- Computer controlled track skip, auto space and music search.
- Auto tape selection ensures best bias and equalisation set every time.
- Synchro record input automatically starts recording at beginning of record.
- Equipped for BUS remote control and timer standby.
- Available in black or gold finish.

The SD-451 has the qualities of SD-551 without dbx noise reduction and simple auto reverse.

SD-551

CPU Logic Mechanism
Auto Reverse
REC/PBDBX/DOLBY B® + C®
Electronic Counter
QMS
BUS.

SD-451

CPU Logic Mechanism
Auto Reverse REC/PB
DOLBY B® + C®
Electronic Counter
QMS
BUS.

BUS

SD-351

E144



A high value deck with the same features and functions as the SD-451 excepting the tape counter which is mechanical on this model. Equipped for BUS remote control the SD-351 is available in gold finish.

Frequency response is 25 Hz to 18 kHz with metal tape. Signal-to-noise ratio 73 dB with Dolby C. Wow and flutter $\pm 0.07\%$.

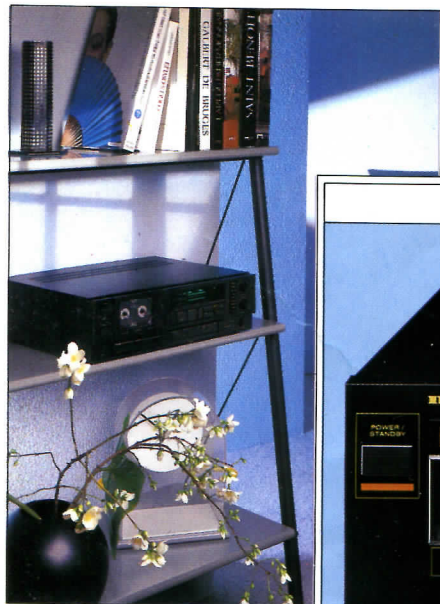
Features

- Microprocessor logic controlled low wow and flutter mechanism.
- Auto reverse mechanism (with display) on record and playback for stable performance and maximum utilisation of tape.
- Dolby B and C noise reduction systems for wide dynamic range recordings.

- Quick acting LED level meter.
- Super Hard Metal Alloy (SHMA) head-long life with metal tape.
- Dual gap erase heads for deep erasure of metal tapes.
- Computer controlled track skip, auto space and music search.
- Auto tape selection ensures best bias and equalisation set every time.
- Synchro record input automatically starts recording at beginning of record.
- Equipped for BUS remote control and timer standby.
- Available in gold finish.

CPU Logic Mechanism
Auto Reverse REC/PB
DOLBY B® + C®
QMS
BUS.

BUS



High Speed Dubbing
QMS
DOLBY B®

SD-155



A twin-deck machine with many convenience features including single touch dubbing and sequential play through both tapes.
Frequency response is 30 Hz to 17 kHz with metal tape. Signal-to-noise ratio 65 dB with Dolby B. Wow and flutter $\pm 0.08\%$.

Features

- Twin soft touch mechanisms for ease of operation.
- High speed dubbing to reduce dubbing time.
- Synchronized one-touch dubbing simplifies tape copying.
- Sequential play offers increased playing time.

- Quick Music Search (QMS) for rapid track identification.
- Auto tape selection ensures correct bias and EQ set automatically.
- Dolby B for improved noise performance.
- Timer standby for timer controlled operation.
- Available in black finish.

NOTE: Radio and T.V. broadcasts and commercially produced records and pre-recorded tapes are subject to copyright protection and to record such materials without the permission/approval of the copyright holder is illegal/ may be illegal.

SD-152 / SD-151



SD-152
DOLBY B® + C®
Timer Stand By.

SD-151
DOLBY B®
Timer Stand By.

The emphasis here is on engineering quality — the SD-152 has an unusually high quality transport made entirely in metal for stability, longevity and improved sound quality.

Frequency response is 30 Hz to 17 kHz with metal tape. Signal-to-noise ratio 70 dB with Dolby C. Wow and flutter $\pm 0.08\%$.

Features

- Soft touch operation of low wow and flutter transport.
- Transport mechanism made of metal throughout with

oversized flywheel for high reliability and improved consistency.

- Super Hard Metal Alloy (SHMA) head-long life with metal tape.
- Dual gap erase head for deep erasure of metal tapes.
- Dolby B and C noise reduction systems for improved dynamic range and flatter, more extended frequency response.
- Timer standby for timer controlled operation.
- Available in black finish.

The SD-151 offers the same benefits as SD-152 except Dolby C noise reduction.



High Speed Dubbing
QMS
DOLBY B®

SD-155



A twin-deck machine with many convenience features including single touch dubbing and sequential play through both tapes.
Frequency response is 30Hz to 17 kHz with metal tape. Signal-to-noise ratio 65 dB with Dolby B. Wow and flutter $\pm 0.08\%$.

Features

- Twin soft touch mechanisms for ease of operation.
- High speed dubbing to reduce dubbing time.
- Synchronized one-touch dubbing simplifies tape copying.
- Sequential play offers increased playing time.

- Quick Music Search (QMS) for rapid track identification.
- Auto tape selection ensures correct bias and EQ set automatically.
- Dolby B for improved noise performance.
- Timer standby for timer controlled operation.
- Available in black finish.

NOTE: Radio and T.V. broadcasts and commercially produced records and pre-recorded tapes are subject to copyright protection and to record such materials without the permission/approval of the copyright holder is illegal/ may be illegal.

SD-152 / SD-151



SD-152
DOLBY B® + C®
Timer Stand By.

SD-151
DOLBY B®
Timer Stand By.

The emphasis here is on engineering quality — the SD-152 has an unusually high quality transport made entirely in metal for stability, longevity and improved sound quality.

Frequency response is 30Hz to 17 kHz with metal tape. Signal-to-noise ratio 70 dB with Dolby C. Wow and flutter $\pm 0.08\%$.

Features

- Soft touch operation of low wow and flutter transport.
- Transport mechanism made of metal throughout with

oversized flywheel for high reliability and improved consistency.

- Super Hard Metal Alloy (SHMA) head-long life with metal tape.
- Dual gap erase head for deep erasure of metal tapes.
- Dolby B and C noise reduction systems for improved dynamic range and flatter, more extended frequency response.
- Timer standby for timer controlled operation.
- Available in black finish.

The SD-151 offers the same benefits as SD-152 except Dolby C noise reduction.

CP-430/CP-230



PORTABLE TAPE RECORDING

The original MARANTZ CD320 and CD330 portable stereo recorders have seen use all over the world in the hands of professionals and amateur tape recordists alike. Technology has advanced and MARANTZ is proud to have two high-performance replacements for two such popular machines.

Both models feature a balanced transport mechanism with a second anti-roll flywheel which ensures that even in rough field conditions the players will achieve high performance wow and flutter figures.

The new models both feature Dolby B noise reduction while the top model, the three-head CP-430, also features dbx. dbx is an ideal noise reduction system for location recording of very wide dynamic range sounds yet it also improves hiss performance in recordings of very low level sounds.

MARANTZ talked to professional users in designing the new portables and decided to make the mains adaptors separate units. This means the CP230 and CP-430 are now lighter than ever while the separate mains unit actually improves noise performance. The two models are light and easily managed on location as the controls have been designed for blind operation at speed.

Though the portables have a long battery life this has been further extended by the incorporation of an economizer circuit on the current-hungry meter illumination which now switches off after a few seconds yet the meters can be lit up again with the tap of a button.

Comprehensive inputs and outputs enable these machines to be equally suited to location work and to use

as conventional home recorders. Both machines come with robust good looking carrying cases.

Features

- Anti-roll tape transport for smooth recording quality.
- dbx (CP-430) and Dolby B noise reduction for high quality location recording.
- (CP-430) Three heads for real off-tape monitoring.
- Cue and review with sound.
- Normal, Chrome and Metal tape selector with fine bias to match the widest possible choice of tapes.
- Auto replay; three digit counter with memory.
- Pitch control for variable speed replay.
- Three-position microphone attenuation and switchable recording limiter to avoid tape saturation.
- Switchable mpx filter for recording from radio.
- Large illuminated VU meters with peak reading LED for accurate level adjustment.
- Built-in speaker with defeat switch and channel selector convenient for location monitoring without headphones.
- Comprehensive microphone inputs for two mono, one stereo mic or for one mono mic to record on both stereo channels simultaneously.
- Phono and DIN input/output options.
- Separate headphone level control.
- Battery checker.

CP-430

Professional Standard
3 Head Monitor
DBX+DOLBY B®
Anti-Rolling Mechanism
VU meter with peak LED
Fine Bias
Pitch Control (P.B.).

CP-230

Professional Standard
2 Head
DOLBY B®
Anti-Rolling Mechanism
VU meter with peak LED
Fine Bias
Pitch Control (P.B.).

PORTABLE ACCESSORIES

The EM-8 one-point stereo microphone is the ideal partner for the CP-230 and 430 portables. It is a uni-directional design with a wide frequency response of 100 Hz to 17 kHz. Plugged into the left channel mic input of either portable the EM8 can be used to record simultaneously on both stereo channels.

The RB-430 rechargeable battery pack will save its own cost time and again in batteries. Automatically recharging from the mains when the portable is connected to the mains adaptor the battery pack replaces the three HP2 battery complement.

