

ELITE HI-FI COMPONENTS

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PIONEER ELITE SERIES — A NEW CLASS OF AUDIO AND VIDEO COMPONENTS







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REFERENCE AMPLIFIERS

C-90

Reference Control Amplifier

We've given the C-90 a twin-mono amp construction which features separate power supplies and chassis layouts for the left and right channels. This elaborate construction shuts out mutual interference between channels, thus dramatically reducing intermodulation distortion. There's also an independent power supply that uses an exclusive transformer for video circuits, displays, relays, microcomputers and electronic switches.

We've also isolated the circuits in the C-90 from the external world because we know that a preamplifier is as susceptible to external disturbances and vibration as any other component. Preamps handle very delicate signals measured in microvolts and millivolts. When subjected to vibration, parts vibrate in sympathy, resulting in a type of distortion called "microphonics." Though subtle, this effect is discernable, especially with the tremendously wide dynamic range possible with digital programs. So we constructed feet from polycarbonate (for optimum shock absorbing response), anchored circuit boards to the chassis with rubber dampers, used flexible copper screws to cushion shocks, and employed a massive solid-aluminum volume control knob.

In order to retain higher purity and integrity, we shortened signal paths as much as possible through the use of relays, electronic switches and other means of electronic control wherever applicable. This has resulted in a drastic reduction of signal loss and deterioration (noise, distortion, crosstalk, etc.).

To boost the delicate signals from moving-coil cartridges, Pioneer's exclusive "hybrid" booster combines a quality transformer and an optimum-gain phono equalizer. With one-half the normal number of turns of coil, the transformer's thicker wire reduces DC resistance and stray wire capacitance for better high-frequency response. The reduced gain in the transformer is compensated for by an equalizer specially designed for low-noise performance. All this ensures that our "hybrid" booster provides a flat response from lows to highs and well-damped sound, making your "analog" records sound better than ever.

Pioneer's policy of using only quality parts is expressed throughout the amplifier, from circuit boards to wiring, from capacitors to semiconductors. Copper plating is used for the chassis and screws, for instance, to reduce subtle magnetic distortion.

In addition to high-quality sound, the C-90 also provides tremendous convenience: it connects, switches and controls six video components — two play-only units (LD players, TV tuners, etc.), three record/playback VCRs, and one processor unit. Besides, it provides two monitor outputs, and a 5-pin RF converter output that accepts an optional RF modulator (JA-RF5) for connecting a conventional TV. Using the sharpness, detail and noise reduction controls, you can even enhance the video as you watch or dub.

And for added convenience, the C-90 comes with a remote control that lets you control volume and input selection, as well as handle other Pioneer audio/video equipment with the "SR" mark. Adding a touch of class to the amplifier is an aluminum front panel finished with a lacquer-like shine.



M-90

Reference Power Amplifier

NON SWITCHING AMP*

The demand for a reliable and high-output power amplifier has never been greater now with the wide dynamic range made possible by the Compact Disc. The M-90 Reference Power Amplifier was designed especially for this digital age.

Speaker systems can have rated impedances of, say, 6 or 8 ohms, but when they play music with wide dynamic variations, the actual impedance can go much lower, especially at low frequencies. With dynamic digital sound, an amplifier must be equipped with a power supply that performs reliably even under the heaviest load. And that's why we've created the M-90: its power supply features two outsize transformers, large electrolytic capacitors (for a total capacitance of 48,000 μ F) and four bridged rectifier circuits with fast-recovery diodes. And in the power amplifier, 16 high-power transistors (8 per channel) are used in an elaborate "four-in-parallel" configuration.

What this means is that the M-90 is ready to deliver a **continuous average power output of 200 watts*per channel, min., at 8 ohms from 20Hz to 20,000Hz with no more than 0.003% total harmonic distortion.** What's even more amazing is its dynamic power: 300 watts at 8 ohms, 550 watts at 4 ohms and 800 watts at 2 ohms (with EIA dynamic test signal).

We also have made signal paths as short as possible to ensure signal integrity. The volume control for CD input is located on the front panel, of course, but actual level adjustment is performed by a potentiometer located behind the input terminals and linked by a long shaft.

In addition to the input for a control amp, the M-90 has an input, with volume control, for direct connection of a Compact Disc player to allow you to enjoy purer-than-ever digital sound. Another line-level direct input is also provided that permits you to add other digital equipment in the future. The M-90 also has an output to allow you to return the signals to the preamp for equalization or recording on a tape deck.

We used our exclusive Non-Switching Circuit Type II for the power output stage, thus ending switching distortion. And we have elaborated on this design to reduce distortion further across a wide power output range. Thermal distortion is also drastically reduced by stabilizing the idling current supplied to power transistors from the moment power is turned on. Moreover, we've reduced non-linear distortion of power transistors to 1/30 that of our class-B amps.

To ensure quality sound, we used quality parts, such as gold-plated in/output jacks, OFC (Oxygen-Free Copper) wiring, and 70 μ m-thick copper-plated circuit boards. To reduce magnetic distortion, the entire chassis is copper-plated, and so are screws used throughout.

Sophisticated craftsmanship is evident from the exterior: the power amp's aluminum panel front glows with a traditional lacquer-like luster. The front panel also contains large fluorescent power output indicators.

*Measured pursuant to the Federal Trade Commission's Trade Regulation Rule on Power Output Claims for Amplifiers.

PIONEER FM/AM DIGITAL SYNTHESIZER TUNER F-91

FM 100.5 MHz 24ch



Active Real-Time Tracing System

Reference Digital Synthesizer Tuner

STATION CALL

71.0 71.5 72.0 72.5 73.0 73.5

74.0 74.5 75.0 75.5 76.0 76.5

TUNING DOWN UP 1-STOP/24 MEMORY FM-BAND-AM

TUNING MEMORY AUTO TUNE PRESET LEVEL CHECK

PIONEER STEREO AMPLIFIER A-91D

Reference Digital Stereo Amplifier

ULTIMATE QUALITY STEREO COMPONENT BY PIONEER

VOLUME CONTROL



DIGITAL-1 DIGITAL-2 DIGITAL-3 DAT-1 TAPE-1 LINE-1 LINE-2 TUNER CD PHONO

DIGITAL INPUT ANALOGUE INPUT

RECORDS

OFF

ON

A10

12

15

18

21

24

27

30

33

36

PRESET

1

2

3

4

5

6

7

8

9

10

11

12

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REFERENCE DIGITAL AMPLIFIER AND TUNER

A-91D

NON SWITCHING AMP*

Reference Digital Non-Switching Integrated Amplifier

Here's an amazing amplifier that's ready for digital reproduction: the A-91D. It even comes with a digital circuit for Compact Discs.

With the A-91D, program signals go through the shortest direct path from circuit to circuit, to minimize chances of noise pickup and to maintain musical purity. We've made this possible by having actual switching and control occur near circuits or input terminals. A "LINE DIRECT" switch lets you further trim the signal route; it runs the input selector direct to the power amp, bypassing all intervening circuits (except volume control) physically as well as electrically. It lets you enjoy unusually clear and clean reproduction from *any* program source.

Subtle vibrations can cause subtle sound degradation by microscopically moving parts and devices. So we've shut them out using a non-resonating frame chassis, insulators and a heat sink, all with a honeycomb construction. They also add to the rigidity of the entire chassis. Using separate circuit blocks contributes to clarity by keeping interference to a minimum.

Our new Non-Switching Circuit Type III features excellent low-impedance driving capability combined with low distortion. Our exclusive power-amp design offers more advantages. One, it puts an end to switching distortion to add clarity to the sound you hear. Two, it fully stabilizes idling current, so that distortion due to thermal fluctuation is reduced to zero. Three, distortion created by power transistors is reduced to 1/50th the original value. Four, load variations are suppressed, and dynamic response is improved when large currents are drawn at low impedances, thanks to separation of the voltage- and current-amplifying stages.

The A-91D is designed to drive low impedances of 6 or even 4 ohms with low distortion over a wide frequency range. Backing it up are two high-capacity power transformers. They are contained in finned die-cast iron cases, filled with a damping agent, which dissipate heat to prevent the increased resistance and impedance that high temperatures can cause. They are also solid and non-resonating, and magnetically shielded to prevent magnetic radiation from affecting delicate signals.

In the A-91D, we've extended the digital advantages by including independent digital conversion circuitry. There are two glitch-free D/A (Digital-to-Analog) converters (one for each channel), a digital filter which uses four times the normal sampling frequency (176.4kHz), and an analog low-pass filter built from quality discrete parts. Use the A-91D with a CD player with digital output such as the Pioneer PD-M90X, and you'll get digital sound in its purest form. There are six digital inputs and three digital outputs, of which two inputs and one output have optical interfaces to permit electrical isolation. An Optical Transfer Distortion Canceller is added to eliminate jitter for accurate optical transmission.

The A-91D delivers a **continuous average power output of 120 watts* per channel, min., at 8 ohms, from 20Hz to 20,000Hz with no more than 0.003% total harmonic distortion.**

*Measured pursuant to the Federal Trade Commission's Trade Regulation Rule on Power Output Claims for Amplifiers.

F-91

SR

Reference Digital Synthesizer Tuner

We've pushed the level of FM sound quality to record highs with the addition of two Pioneer exclusives to the F-91.

The first is the ARTS (Active Real-Time Tracing System) included in the IF section of the tuner. With some tuners, especially expensive ones, you have the choice of using a narrow or wide IF bandwidth. The first lets you avoid interference, but you have to settle for an increase in distortion. The second provides lower distortion and better sound, but interference may get in the way. Pioneer ARTS — it's simply the best of both worlds: its IF filter *actively* follows the desired signal while rejecting interference. Now you can enjoy both the low distortion of a wide bandpass *and* the high selectivity of a narrow bandpass. Sensitivity is improved, too.

The second Pioneer feature is the Digital Direct Decoder Type III. It takes the output from the ARTS IF circuitry and converts it into digital form before directly turning it into stereo analog signals. Thanks to digital operation, our DDD Type III is less prone to signal degradation. Moreover, in the Type III, we've simplified the circuitry using a new PLL detector, which has reduced noise even further.

Improvements extend to other circuits of the tuner as well. The front end, for instance, features an ID MOS FET to improve reception. Indeed, the front end is as highly sensitive and selective as an elaborate 4-ganged tuning capacitor.

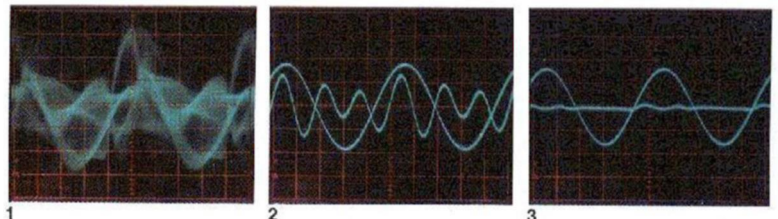
The F-91, like our amps and CD players, is designed based on our anti-vibration concept to damp harmful resonance and vibration for improved sound. We've turned circuits into modules and filled them with epoxy resin. And we've added honeycomb ribs to the chassis and used large insulators to shut out external vibration.

Then, of course, there are a wealth of features designed to improve convenience. You can preset up to 24 FM and AM stations in any combination. Up to three different stations can be programmed so that, when controlled by an optional timer, they are tuned in sequence — a convenient way to make unattended recording.

More features for convenience are an auto tuning mode, selectable muting level, recording level calibrator, and a fluorescent display.

Pioneer ARTS (Active Real-Time Tracing System)

A conventional wideband filter permits low-distortion reception but suffers when undesirable signals interfere (Photo 1). An alternate narrowband filter may cut interference, but can add distortion because of the limited bandwidth (Photo 2). Photo 3 shows the response of the F-91 with ARTS. As you can see, it delivers a low-distortion signal even when there's interference. The Pioneer ARTS simply combines the low-distortion performance of a wide bandwidth and the high selectivity of a narrow bandwidth.



REFERENCE MULTI-PLAY COMPACT DISC PLAYER

PD-M90X

Six-disc multi-play convenience

Class and convenience happily coexist in the PD-M90X, which combines classical elegance with computer-age features.

Our top-of-the-line multi-play CD player, the PD-M90X lets you enjoy beautiful, dynamic digital sound for hours and hours, uninterrupted. It accepts up to six CDs mounted inside a special magazine and plays the discs just the way you want them played. You can play each song on all six discs one by one, or jump to the song or disc you want instantly, using DISC NUMBER and TRACK NUMBER buttons provided both on the remote control and on the unit itself. For added convenience, you can also select up to 32 tracks from the six discs and program them for playback in any order! A single-disc loader is also standard for single-play convenience.

Remote control with "one-touch" program loading

The PD-M90X comes provided with a full-function "SR" remote control. It offers three extra conveniences: a numeric keypad, a multi-function LCD (Liquid Crystal Display) panel and the MPSS* (Magazine Program Selection System). The keypad gives you instant access to any track, a feature you'll also find useful when programming tracks. The LCD panel serves as a guide to programming, letting you preset tracks and the order away from the player while referring to labels of the discs.

The Magazine Program Selection System permits you to store up to 80 programmed "steps" (songs and pauses) from eight six-disc magazines. Using MPSS, you are saved from reprogramming tracks each time you mount a magazine: all you have to do is press the memory button for that specific magazine and the "transfer" button. The programmed songs are then automatically "loaded" from the remote into the player. Now loading programmed tracks has become as simple as touching a button.



4-way repeat, random play, fluorescent panel and other conveniences

The PD-M90X offers four-way repeat, including a single track, a single disc, all six discs and programmed tracks. The random play feature lets you leave track selection up to the player — touch the RANDOM PLAY button, and a built-in microcomputer randomly selects the songs for you from among the six loaded discs, without repeating tracks! ** Or, press this key in the programmed play mode, and the computer randomly selects songs from among those programmed. Programmable pauses, 2-speed manual search, track search, and timer start function with options of normal and random play — these are other conveniences of our multi-play CD player.

A multi-function 7-digit fluorescent display is provided to show you the operating status of the player. It shows the elapsed time and remaining time of a track in play, as well as the remaining time of an entire disc. In addition, the display shows the accumulated total time each time you program a track. A graphic indicator shows which disc is being played at any moment.

Anti-vibration concept

When it comes to hi-tech features for better digital sound, the PD-M90X has plenty. To damp vibration and resonance, which can cause muddy sound, we use a copper-plated honeycomb chassis; a Disc Stabilizer to firmly clamp the rotating disc; and large aluminum-ringed insulators made of vibration-absorbing polycarbonate.

Oversampling digital filter

An oversampling digital filter using twice the normal sampling frequency — 88.2kHz — ensures low noise and minimal phase distortion for extra clarity and razor-sharp sound definition.

Digital level control

A digital level control lets you attenuate the playback level from the remote. Since it adjusts the signal while still in digital form, our digital volume control adds a minimum of noise and distortion.

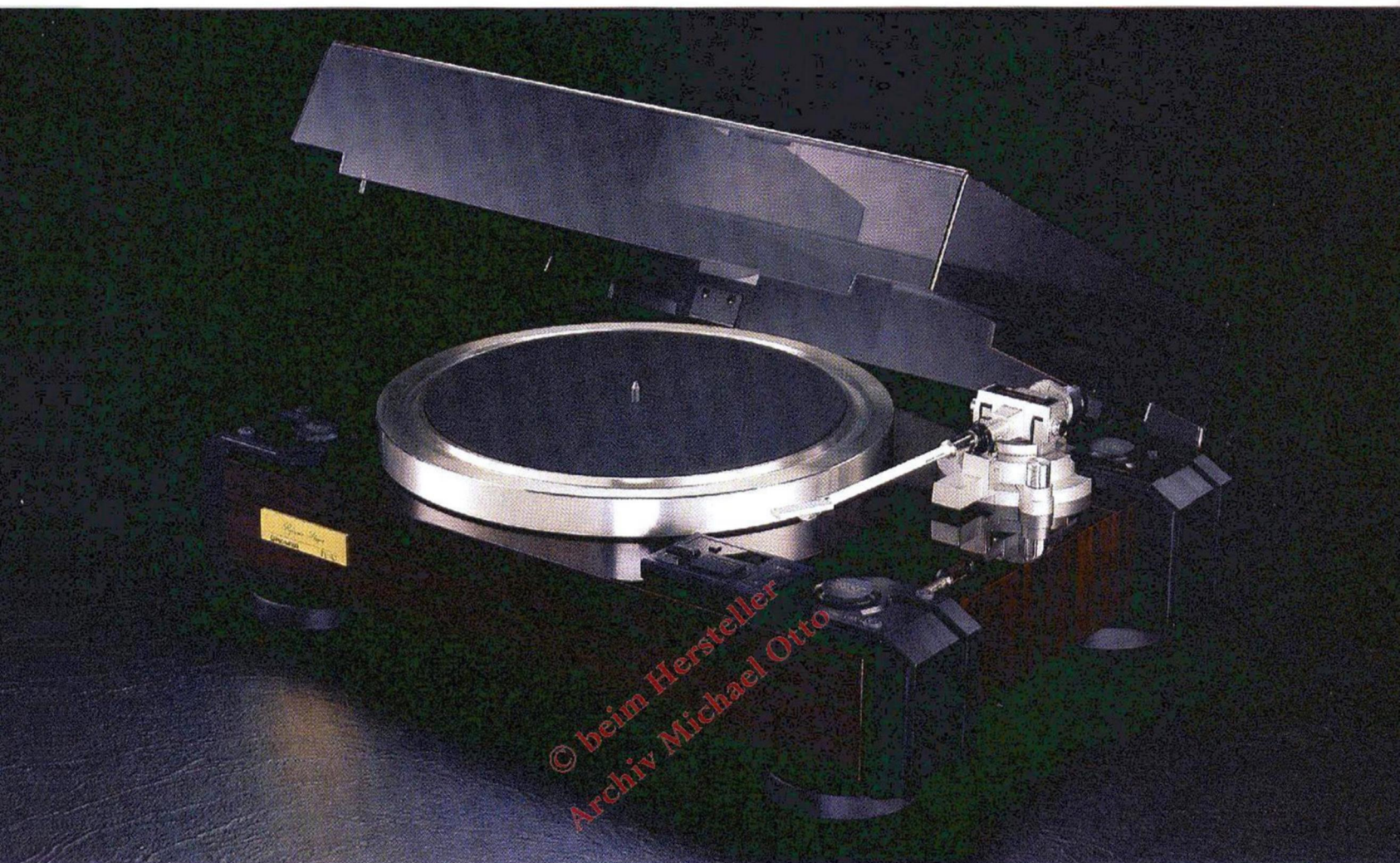
Digital output

There is a digital output for connection to an outboard DAC (Digital-to-Analog Converter) unit or an amplifier featuring a built-in DAC like the Pioneer A-91D, so that you'll enjoy better yet, purer yet digital sound.

* MPSS is a trademark of Pioneer Electronic Corporation.

** Some tracks may repeat when a disc contains more than 100 tracks.

Note: The PD-M90X comes with both a 6-disc magazine and a single-disc loader. Additional magazines (JD-M100) are available as options.



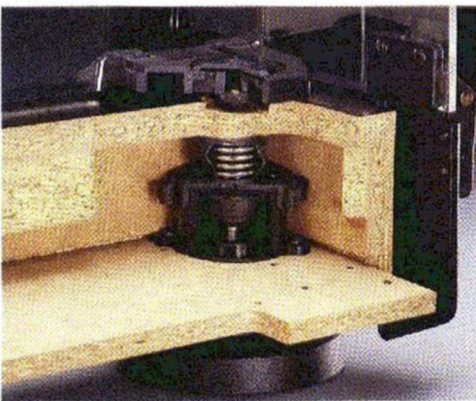
REFERENCE QUARTZ-PLL DIRECT-DRIVE TURNTABLE

PL-90

Think of it as the most advanced form in turntable technology. The PL-90 is designed to let you enjoy the maximum dynamic range and low distortion that today's best analog recordings can deliver.

To get the best performance out of today's sophisticated phono cartridges, we've fashioned its straight tone arm out of light yet rigid alumina-ceramics. Then we've fitted on it a Pioneer DRA (Dynamic Resonance Absorber), a combination of a viscous damper and weight, to eliminate resonance.

To ensure that your records are played with extremely low noise and wow and flutter, we use a coreless direct-drive DC-servo motor controlled



by a precise quartz-PLL servo system to provide cog-free and ripple-free smooth torque generation. The motor is fitted with a Stable Hanging Rotor to improve stability. The platter is large (14-3/16 inches across), heavy (7 lbs. 4 oz.) and has a high moment of inertia (655 kilograms per square centimeter), to smooth out rotation.

The important tone arm and motor are fully insulated from external influences through a Double Insulation System that shuts out vibration in both horizontal and vertical planes. The cabinet is made of high-density material to suppress resonance.

Ease of use is enhanced with the addition of automatic arm lift-up at the end of record play.



DIGITAL STANDARD SPEAKER SYSTEMS

DSS-E10/DSS-E6



Here's a pair of speaker systems specifically designed to serve as standards for accurate digital reproduction. A number of Pioneer exclusive designs has contributed to the making of our reference speaker systems.

One is the LDMC (Linear-Drive Magnetic Circuit) in the woofer. It creates a uniform magnetic field over a wide range within the voice coil gap. As a result, the voice coil is driven by the same uniform force, whether it is being pushed far outward to create very loud sounds, or is hardly moving to produce the faintest notes. The LDMC makes the sound you hear refreshingly transparent, powerful and exceptionally lifelike.

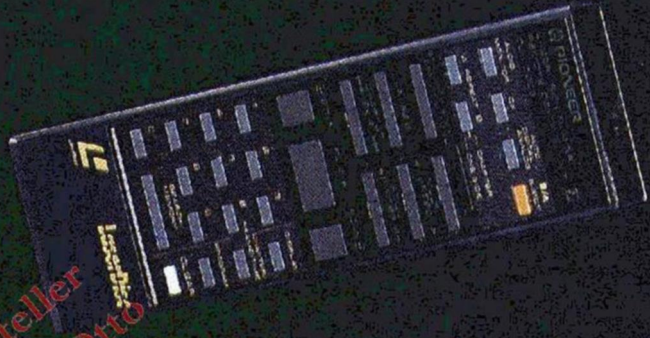
Our woofers also feature the EBD (Electronic Bass Drive). This design uses two voice coils wound on the bobbin, one on top of the other. Driven by two frequency-divided voice coils, the woofer pro-

duces double the amount of usable bass sound, extending the low-frequency response substantially.

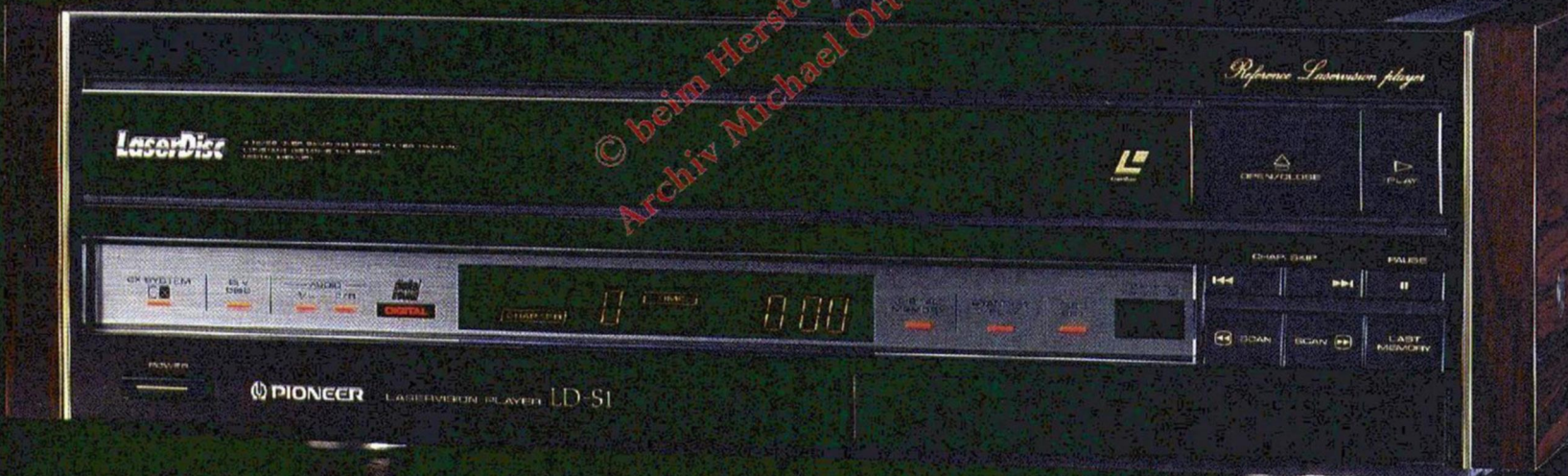
Our DRS (Dynamic Response Suspension) improves the linearity of the damper and surround of the woofer, so that the driver responds accurately to a wide range of inputs from the loudest to softest sounds. This adds to a wider dynamic range.

The diaphragm of the woofer is made of Pioneer's PG or Polymer Graphite* that's light and firm. It combines low distortion, smooth response and low coloration. The midranges are made of hard boron to improve sensitivity and assure natural response. Tweeters are lightweight and responsive beryllium ribbons combining better transient response and low distortion.

**Polymer Graphite is a trademark of Pioneer Electronic Corporation.*



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REFERENCE LD PLAYER

LD-S1

The best in picture and sound

Here's the finest LD player available to consumers anywhere in the world. Designed and engineered specifically for the videophile with an ear for excellent sound. Take a look at some of the LD-S1's standout specifications: 420-line horizontal resolution, 48dB video signal-to-noise ratio, 105dB audio signal-to-noise ratio and 97dB audio dynamic range.

Full-floating drive system

Subjected to vibration, the pickup of an LD player can cause jitter, patchy colors and streaks in solid colors. And vibrating PC boards can muddy the sound. So we've isolated the motor disc drive from the rest of the chassis, to reduce the amount of vibration passed from the motor to other parts of the player. The result is a drastic reduction of jitter and streaks. Specifically: Our new Dynamic Pressure Bearing has lessened the load applied to the metal bearing. As the shaft starts to rotate, liquid silicone collects under the shaft, cushioning it and supporting it to prevent direct contact with the bearing. Transmission of motor vibration is lessened and friction reduced for smoother motor rotation.

Our magnetic disc clamper uses a powerful magnet to hold the disc. The moment a disc is in place, the clamper arm is removed from the clamper, thus ending the transmission of the motor vibration to other parts of the player.

Accu-Focus System

The tracking beams reflected from the disc are added by the quadrant photodetector inside the pickup assembly. But there is a slight phase difference between the outputs from leading and trailing beams. In the LD-S1, however, the outputs from the leading beam are delayed so that they can be added to those from the trailing beam in time. This reduces distortion and improves frequency response, especially the highs, of the RF output. Both audio and video benefit.

4X oversampling digital filter and twin D/A converters

We've incorporated a digital filter using a sampling frequency 4 times higher than that used in conventional filters. Working with an analog low-pass filter, it reduces phase delay as well as distortion. To eliminate phase difference between channels, we use two independent glitch-free D/A (Digital-to-Analog) converters. LDs with digital sound have never sounded better.

Digital memory

Eight-bit digital memory brings you versatile and clean special effects — the LD-S1 is the first player ever to be equipped with this innovative feature. You can freeze and store a picture in memory for viewing anytime. You can enjoy still and multi-speed play even from CLV (Extended-Play) discs, not to mention CAV (Standard-Play) discs. You'll also enjoy "strobe motion" and still with sound, two exciting new additions. Pictures are exceptionally stable and free of noise. Scanned pictures are also free of noise bars.

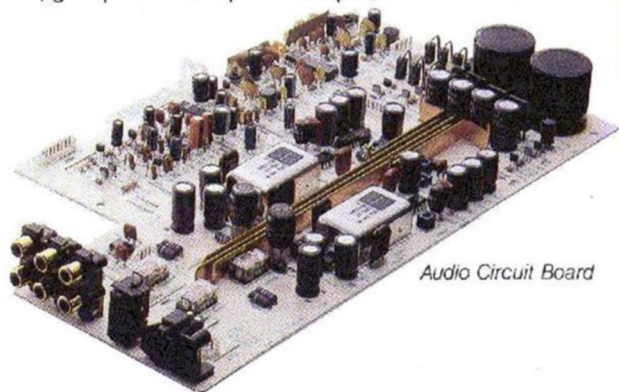
Elaborate power supply and quality parts

The LD-S1's power supply is elaborate, using two transformers, one for servo and digital circuits, and another for audio and video circuits. And to shut out interference between audio and video circuits, each has a separate power supply (independent coil windings on the transformer) and is laid out so that it is separated from the other. Quality parts are used for improved sound and picture, including a 1mm-thick OFC (Oxygen-Free Copper) ground bus plate, gold-plated terminals, copper-plated chassis, and OFC AC power cable.

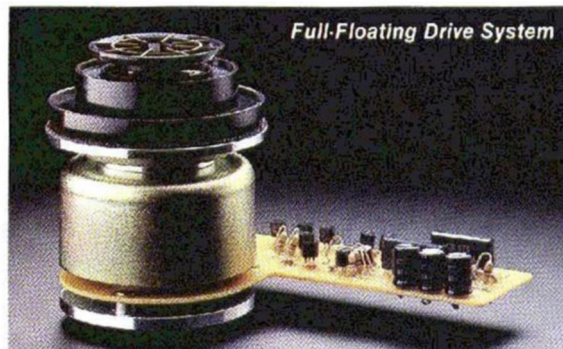
Superb operating conveniences

The LD-S1 is equipped with a number of features to make operations superbly easy. Any part of a disc can be accessed in one-half the normal time of conventional players. A large fluorescent panel serves as your guide to operation. A new addition is the "Last Memory" feature: press the "LAST MEMORY" button before shutting off the power, and at the next viewing play resumes with a scene a few seconds back from where you left off. The front panel has all the controls you need for operation. And the remote control is ergonomically designed for ease of use.

Available functions include Still/Step, Dual-Speed Scan, Frame/Time Search, Chapter Search, 9-Step Multi-Speed Play, 4-Mode Repeat, Chapter-Skip Search and Chapter Program. Other features include on-screen display, picture tone control, two video outputs, I/O port for computer interface, gold-plated headphone output, and an SR terminal.



Audio Circuit Board



Full-Floating Drive System

SR

L
LaserVision

digital
SOUND

LaserDisc™

SPECIFICATIONS

C-90

AUDIO SECTION

Rated Output:	8V (20 — 20,000Hz, 10k ohms, T.H.D. 0.001%)
Input Sensitivity/Impedance	
PHONO (MM):	2.5mV/50k ohms
PHONO (MC):	0.25mV/40 ohms or 0.125mV/3 ohms
CD, TUNER, AUX, TAPE:	150mV/50k ohms
Output Level/Impedance	
PRE OUT:	1V/600 ohms
TAPE REC:	150mV/1k ohms
Total Harmonic Distortion:	0.002% (20 — 20,000Hz, 10k ohms, output 1V)
Intermodulation Distortion:	0.002% (output 1V)
(50Hz: 7,000Hz = 4:1, 8 ohms)	
Frequency Response	
PHONO (RIAA Equalization):	20 — 20,000Hz ± 0.2dB
CD, TUNER, AUX, TAPE:	20 — 20,000Hz 0dB, — 1dB
Tone Control	
BASS:	± 9dB (100Hz)
TREBLE:	± 9dB (10kHz)
Muting:	— 20dB
Signal-to-Noise Ratio (IHF, A-network)	
PHONO:	95dB (MM), 86dB (MC)
CD, TUNER, AUX, TAPE:	109dB

VIDEO SECTION

Input Sensitivity/Impedance	
VCR, VCR, TV Tuner, Adaptor:	1Vp-p/75 ohms
Output Level/Impedance	
Monitor, Adaptor, REC Monitor:	1Vp-p/75 ohms
Frequency Range:	10Hz — 10MHz 0dB, — 3dB

MISCELLANEOUS

Power Requirements:	120V 60Hz
Power Consumption:	40W
Dimensions (W x H x D):	18 x 4-15/16 x 15-15/16 inches
(without package)	457 x 125 x 405 mm
Weight (without package):	21 lbs. 6 oz./9.7kg

M-90

POWER AMPLIFIER SECTION

Continuous average power output of 200 watts* per channel, min., at 8 ohms, from 20Hz to 20,000Hz with no more than 0.003% total harmonic distortion.

Total Harmonic Distortion:	0.003% (20 — 20,000Hz, 8 ohms, continuous rated power output)
Intermodulation Distortion:	0.002% (continuous rated power output)
(50Hz: 7,000Hz = 4:1, 8 ohms)	
Input Sensitivity/Impedance	
CONTROL AMP:	1V/50k ohms (fixed)
CD DIRECT, LINE DIRECT:	1V/50k ohms (variable)
Output	
SPEAKERS:	A, B, A+B, OFF
HEADPHONES:	Low impedance
Frequency Response (CD):	20 — 20,000Hz 0dB, — 0.1dB
Signal-to-Noise Ratio:	125dB (IHF, A-network)
MISCELLANEOUS	
Power Requirements:	120V 60Hz
Power Consumption:	430W (UL)
Dimensions (W x H x D):	18 x 6-1/16 x 16-15/16 inches
(without package)	457 x 154 x 430 mm
Weight (without package):	49 lbs. 13 oz./22.6kg

A-91D

AMPLIFIER SECTION

Continuous average power output of 120 watts* per channel, min., at 8 ohms from 20Hz to 20,000Hz with no more than 0.003% total harmonic distortion

Total Harmonic Distortion:	0.003% (20 — 20,000Hz, 8 ohms, continuous rated power output)
Input Sensitivity/Impedance	
PHONO (MM):	2.5mV/50k ohms
PHONO (MC):	0.25mV/40 ohms
CD, TUNER, AUX, TAPE:	150mV/50k ohms
PHONO Overload Level (1kHz)	
MM/MC:	200mV/20mV (T.H.D. 0.008%)
Output Level/Impedance	
TAPE REC:	150mV/0.8k ohms
SPEAKERS:	A, B, A+B, OFF
HEADPHONES:	Low impedance
Frequency Response	
PHONO (RIAA Equalization)	
MM:	20 — 20,000Hz ± 0.2dB
MC:	20 — 20,000Hz ± 0.3dB
CD, TUNER, AUX, TAPE:	1 — 150,000Hz 0dB, — 3dB
Tone Control	
BASS:	± 8dB (100Hz)
TREBLE:	± 8dB (10kHz)
Filter (Subsonic):	17Hz (— 12dB/oct.)
Loudness Control:	+ 5dB (100Hz), + 3dB (10kHz)
Volume at — 40dB position)	
Signal-to-Noise Ratio (IHF, short-circuited A-network)	
PHONO (MM/MC):	95dB/83dB
CD, TUNER, AUX, TAPE:	109dB
MISCELLANEOUS	
Power Requirements:	120V 60Hz
Power Consumption:	670W (UL)
Dimensions (W x H x D):	18 x 6-13/16 x 18-11/16 inches
(without package)	457 x 173 x 475 mm
Weight (without package):	65 lbs. 15 oz./29.9kg

F-91

FM TUNER SECTION

Usable Sensitivity (mono):	9.8cBf (0.85µV, 75 ohms)
50dB Quieting Sensitivity	
Mono:	12.8dBf (1.2µV, 75 ohms)
Stereo:	34.8dBf (15µV, 75 ohms)
Signal-to-Noise Ratio	
Mono/Stereo (IHF):	95dB/87dB
Distortion (at 80cBf)	
100Hz (mono/stereo):	0.015%/0.02%
1kHz (mono/stereo):	0.009%/0.02%
6kHz (mono/stereo):	0.02%/0.07%
Frequency Response:	20 — 15,000Hz + 0.2dB, — 0.8dB
Capture Ratio:	0.8cB
Alternate Channel Selectivity:	85dB (400kHz)
Spurious Response Ratio:	80dB
Image Response Ratio:	70dB
IF Response Ratio:	100dB
AM Suppression Ratio:	70dB
Subcarrier Product Ratio:	60dB
Muting Threshold:	25.2dBf (5µV, 75 ohms)
Stereo Separation	
1kHz:	65dB
20 — 10,000Hz:	55dB
Antenna Input:	75 ohms unbalanced

AM TUNER SECTION

Sensitivity	
IHF, Loop Antenna:	150µV/m
Selectivity:	18dB
Signal-to-Noise Ratio:	50dB
Image Response Ratio:	40dB
IF Response Ratio:	60dB
Antenna:	Loop antenna

AUDIO SECTION

Output (Level/Impedance)	
FM (100% Mod, Fixed):	650mV/800 ohms
AM (30% Mod, Fixed):	150mV/800 ohms

MISCELLANEOUS

Power Requirements:	120V 60Hz
Power Consumption:	25W
Dimensions (W x H x D):	18 x 3-5/16 x 12-7/16 inches
(without package)	457 x 84 x 316 mm
Weight (without package):	11 lbs. 7 oz./5.2kg

*Measured pursuant to the Federal Trade Commission's Trade Regulation Rule on Power Output Claims for Amplifiers.

PD-M90X

System:	Compact disc digital audio system
Frequency Response:	4 — 20,000Hz \pm 0.5dB
Signal-to-Noise Ratio (EIAJ):	100dB
Dynamic Range (EIAJ):	96dB
Channel Separation (EIAJ):	93dB
Wow and Flutter (EIAJ):	Unmeasurable (\pm 0.001%, weighted peak)
Distortion (EIAJ):	0.0035%
Output Voltage (EIAJ):	2V \pm 0.5V
Power Requirements:	120V 60Hz
Power Consumption:	23W
Dimensions (W x H x D):	18 x 4-1/8 x 12-3/8 inches
(without package)	457 x 104 x 315 mm
Weight (without package):	15 lbs./6.8kg

PL-90

MOTOR AND TURNTABLE

Drive System:	Direct Drive
Motor:	Coreless, Quartz-PLL DC-servo motor with Stable Hanging Rotor™
Turtable Platter:	14-3/16 inches (36cm)
Inertial Mass:	655kg/cm ²
Speed:	33-1/3 and 45 rpm
Wow and Flutter (WRMS):	0.018% (0.008%*)
Signal-to-Noise Ratio:	85dB (DIN B)

tone arm

Type:	Statically balanced, alumina-ceramics straight tone arm with DRA
Effective Arm Length:	11-1/8 inches (282mm)
Overhang:	9/16 inch (13.5mm)
Usable Cartridge Weight:	2.4g — 12g

MISCELLANEOUS

Power Requirements:	120V 60Hz
Power Consumption:	14W
Dimensions (W x H x D):	23-7/16 x 8-7/16 x 17-1/16 inches
(without package)	596 x 215 x 434 mm
Weight (without package):	38 lbs. 2 oz./17.3kg

*Measured directly from FG output.

DSS-E10

Enclosure:	Bass-reflex bookshelf type
Unit Layout:	Symmetrical
Speakers	
Woofer:	12-inch (30cm) PG™ cone type
Midrange:	4-3/4-inch (12cm) boron cone type
Tweeter:	Beryllium ribbon type
Impedance:	6 ohms
Frequency Range:	30 — 50,000Hz
Sensitivity:	91dB/W (1m)
Maximum Music Power:	240W
Rated Power:	80W
Crossover Frequencies:	650Hz (Low/Mid) 4,000Hz (Mid/High)
Dimensions (W x H x D):	15-3/8 x 26-3/4 x 13-7/8 inches
(without package)	390 x 680 x 353 mm
Weight (without package):	57 lbs. 5 oz./26kg

DSS-E6

Enclosure:	Bass-reflex bookshelf type
Unit Layout:	Symmetrical
Speakers	
Woofer:	8-inch (20cm) PG™ cone type
Midrange:	2-1/2-inch (6.6cm) boron cone type
Tweeter:	Beryllium ribbon type
Impedance:	6 ohms
Frequency Range:	40 — 50,000Hz
Sensitivity:	90dB/W (1m)
Maximum Music Power:	120W
Rated Power:	40W
Crossover Frequencies:	1,000Hz (Low/Mid) 5,000Hz (Mid/High)
Dimensions (W x H x D):	10-5/8 x 18-1/2 x 9-9/16 inches
(without package)	270 x 470 x 243 mm
Weight (without package):	23 lbs. 2 oz./10.5kg

LD-S1

TYPE:	LaserVision videodisc system
OUTPUTS	
VHF Output (NTSC)	
Channel:	Channel 3 or 4 (switchable)
Terminal:	F-type jack (75 ohms, unbalanced)
Video Output:	
Output Level:	1Vp-p (75 ohms, sync. negative)
Output Terminals:	RCA jack (75 ohms, unbalanced)
Audio Output:	
Channels:	Discrete 2 channels (1/L, 2/R, 1/L+2/R, switchable)
Output Level:	Digital sound: 200mV rms (1kHz, -20dB) Analog sound: 200mV rms (1kHz, 40%) RCA jacks
Output Terminals:	

DIGITAL AUDIO CHARACTERISTICS

Frequency Response:	4 — 20,000Hz (+0.5dB)
Signal-to-Noise Ratio:	105dB
Dynamic Range:	97dB
Channel Separation:	100dB
Total Harmonic Distortion:	0.0035%

ANALOG AUDIO CHARACTERISTICS

Frequency Response:	20 — 20,000Hz
Signal-to-Noise Ratio:	70dB (CX on)
Dynamic Range:	70dB (CX on)

MISCELLANEOUS

Power Requirements:	120V 60Hz
Power Consumption:	55W
Dimensions (W x H x D):	18 x 5-3/8 x 18-7/16 inches
(without package)	457 x 136 x 468 mm
Weight (without package):	36 lbs. 15 oz./16.8kg

LaserDisc™

LaserDisc is a trademark of Pioneer Electronic Corporation.



The LaserVision mark certifies compatibility with other laser optical video products bearing the mark.



This mark indicates the compatibility for the Pioneer system remote control.

Note: Specifications and design subject to modification without notice.



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