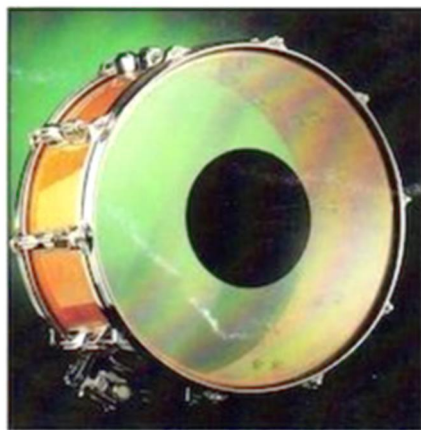


*Masterpieces... from the leader in digital audio™*



*ES SERIES*

*It starts with the press of a key – a moment filled with anticipation and expectation. Then, from a background of total silence emerges sound so pure, so life-like, that in those brief moments before you become totally immersed in the music, you realize you're about to partake in one of those rare, magical listening experiences.*

**SONY®**

# *A quest for perfection.*

*The ES Series comprises extraordinary audio components, each an expression of Sony's relentless quest for flawless music reproduction. Designed by engineers whose dedication to advancing the state of the audio art is equaled only by their intense love of music. Sony ES Series components represent a significant achievement in the history of sound reproduction.*

*Sony's many contributions to the art and science of music reproduction over the years have often been hailed as revolutionary breakthroughs. And today, as we venture further into the age of digital audio, Sony innovations are playing an ever-widening role in improving the quality of the music we enjoy.*

*Even if you do not currently own a single Sony audio component, chances are you've been enjoying the benefits of the latest Sony technology. As more of today's music is being recorded and mastered digitally, more recording and production facilities are turning to Sony professional digital audio products. The Sony PCM-3324 system, for example, has become the world's best-selling digital multitrack recorder. And Sony's PCM-1610/1630 digital mastering systems have become the CD industry's *de facto* standard.*

*But Sony's reputation as THE LEADER IN DIGITAL AUDIO™ has been earned not only in the recording studio, but in the home, as well. As the inventor of the CD format, Sony's experience in the design and manufacture of compact disc players is unsurpassed. From the Sony*

*CDP-101, the world's first CD player, to the present state-of-the-art ES Series, Sony components have been instrumental in making digital audio's promise of vastly superior quality and convenience a reality for the music lover.*

*Today, the Sony ES Series is a complete line of masterfully crafted audio components, including not only the world's finest CD players, but also superb analog components that do full justice to Sony's exceedingly high standards of digital audio excellence. Each ES Series component is truly a masterpiece, engineered without compromise to bring you closer than ever to perfection in music reproduction.*



#### *THE SONY ES SERIES*

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Sony ES Series CD players incorporate the latest generation of digital audio technologies that address all critical areas of disc tracking and signal processing to bring you all the power, breadth, nuance, and detail of the finest CD recordings. They also provide the most advanced programming and operating features to ensure pleasurable, convenient CD listening.

Among the extraordinary technical achievements is the Sony CXD-1144, the industry's first 8X oversampling digital filter IC. This entirely new 18-bit, 8X Oversampling Digital Filter, is employed in the CDP-707ESD, CDP-507ESD and CDP-C15ESD. It results in the virtual elimination of "ripple" effects that degrade the sound in typical digital filters. The improvement in clarity is particularly noticeable with transient musical signals, such as a single note from a piano.

The use of this 352.8kHz oversampling filter design permits the use of an extremely gentle analog low pass filter with superior group delay characteristics. The result is a marked reduction in digital quantization noise and improved purity of the music signal, especially at high frequencies.



New 3" CD software opens the door to an expanded world of compact disc entertainment. This economical format provides a convenient way to enjoy shorter albums while maintaining the full digital audio quality of the full-size discs. All ES Series single CD players and 5-disc carousel changers let you play the 3" CD software without the use of adaptor rings.

## Great sound starts with a great source.

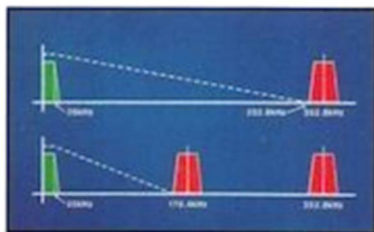
To handle the 18-bit output of the new digital filter the CDP-707ESD employs Dual 18-bit Linear Digital-to-Analog (D/A) Converters. They bring the D/A conversion process closer to the theoretical limits of resolution than any previous design. This advanced converter also provides greater low-level signal resolution capability for improved overall linearity. You'll enjoy the full dynamic range capability of your CDs with more faithful reproduction of fine detail and acoustic depth. And because there is an independent D/A converter for each channel, you're assured optimum separation with no interchannel time delay. The stereo image is recreated with pinpoint accuracy.

Sony ES Series CD players deliver not only state-of-the-art sonic performance, but also the highest level of playback versatility. All players, except the CDP-C15ESD 10-disc changer, let you play the new 3" CD software providing up to 20 minutes of music without the need for adaptor rings.

A sophisticated, new Custom File feature lets you program and store special data to facilitate disc identification and increase your playback options. Custom File includes Disc Memo, Program Bank, and Custom Index functions for up to 226 separate compact discs in your library. And a memory backup system protects your programming during power interruptions.

For superior disc tracking performance, Sony has developed an improved Error Prediction Logic™ II (EPL II) system. This microprocessor circuit is able to predict the location and duration of disc errors with response time as fast as 1/10,000 second. Tracking and focus servos make adjustments before errors re-occur to dramatically reduce the amount of servo compensation required. Combined with Sony's Linear Motor Tracking Mechanism, which replaces conventional motors and gears with a simpler, much more precise, linear-torque motor, EPL II circuitry assures stable, responsive tracking with an impressive ability to handle even badly defective discs.

Advanced digital audio technology for matchless musical reproduction... Sophisticated operating features for the ultimate in flexibility and convenience... The Sony ES Series CD players provide the foundation on which to build the music system of your dreams.



Sony's proprietary 18-bit 8X Oversampling Digital Filter employs a 352.8kHz sampling frequency — 8 times higher than the standard 44.1kHz rate. Noise bands are shifted to a much higher frequency so that a final stage analog filter with an extremely gentle slope can be used — even gentler than would be possible with 4X oversampling. It ensures cleaner transients and smoother, untiring CD reproduction.





Custom File includes Disc Memo, which displays a 10-character "message" of your choice, such as disc title, artist's name, catalog number, etc., each time a disc is loaded.

Program Bank stores a particular track selection and playback sequence for each disc. It eliminates manually re-entry of track programming each time a disc is played.

Custom Index lets you "mark" and quickly locate up to 6 points on a disc.

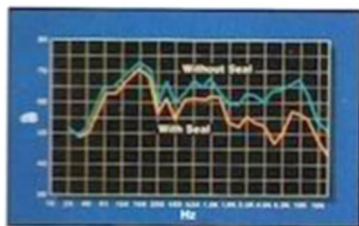


The new reference standard. Featuring the latest Sony digital audio technology and the most sophisticated programming and convenience controls yet devised, the CDP-707ESD delivers unprecedented sonic purity and sheer CD listening enjoyment. It is the CD player to which all others will ultimately be compared.

## CPD-707ESD Compact Disc Player



Full-function 20-key wireless Remote Commander<sup>®</sup> unit (supplied) provides total control of all operating and programming features, including variable line output.



The CDP-707ESD's Acoustically Sealed Construction includes a special rubber around the disc drawer opening. When the drawer is closed, airborne vibrations are effectively damped and prevented from affecting playback performance. Graph shows difference in vibration damping with and without seal.

Sony's proprietary 18-bit, 8X oversampling digital filter design virtually eliminates "ripple" effects. High-frequency smoothness and detail are significantly improved.

Dual 18-bit linear D/A converters provide up to 4 times the resolution of conventional 16-bit designs. The music's full dynamic range is reproduced with superior accuracy and acoustic depth.

Optical and Coaxial Direct Digital Outputs permit direct connection to digital inputs of present (such as DAS-703ES and TA-E 77ESD) and future peripheral components.

Error Prediction Logic<sup>™</sup> II (EPL II) provides exceptional tracking response and servo stability for greatly improved handling of disc defects.

Aluminum die-cast optical transport base with multi-layer G-Chassis<sup>™</sup> and W-chassis construction eliminates mechanical vibrations and resonances that can color the reproduced sound.

Left/Right Twin Mono circuit configuration ensures optimum channel separation and extremely low cross-channel interference.

14-stage Multiple Power Supply design with two independent power transformers ensures extremely stable performance and helps eliminate noise leakage between stages.

Custom file provides Disc Memo, Program Bank, and Custom Index features. They let you program disc ID, desired selections/indexing for up to 226 discs.

20-key Direct Access<sup>™</sup> system enables instant track selection.

20-selection Random Music Sensor (RMS), Automatic Music Sensor<sup>™</sup> (AMS), High-speed Search, Index Search, and Shuffle Play.

Delete Shuffle Play permits removal of unwanted selections from shuffle sequence.

Program edit automatically calculates total playback times.

5 repeat modes (single, all, RMS, Shuffle, A-B).

Music Calendar and timekeeper displays provide complete disc playback information.

New 3" CD software can be played without adaptor ring.

Reference-quality performance with the most advanced operating conveniences. The CDP-507ESD is a CD player with exceptional playback versatility and outstanding sonic capabilities. It is one of the finest examples of the state of the digital audio art.

## CDP-507ESD Compact Disc Player



Full-function 20-key wireless Remote Commander<sup>®</sup> unit (supplied) provides total control of all operating and programming features, including variable line output.



Sony's proprietary 18-bit, 8X oversampling digital filter design virtually eliminates "ripple" effects. High-frequency smoothness and detail are significantly improved.

Staggered 4 D/A Converter handles the 8X oversampled data with two 16-bit D/A converters per channel. This extremely accurate D/A system ensures higher resolution and lower quantization noise.

Optical and Coaxial Direct Digital Outputs permit direct connection to digital inputs of peripheral components.

Error Prediction Logic<sup>™</sup> II (EPL II) provides exceptional tracking response and servo stability.

Cerasin<sup>™</sup> (ceramic/polyresin) optical transport base with stiff multi-layer chassis construction effectively controls mechanical vibrations and resonances that can color the reproduced sound.

Left/Right Twin Mono circuit configuration.

9-Stage Multiple Power supply design with two independent power transformers ensures extremely stable performance.

Custom File provides Disc Memo, Program Bank, and Custom Index features. They let you program disc ID, desired selections/indexing for up to 226 discs.

20-key Direct Access<sup>™</sup> system enables instant track selection.

20-selection Random Music Sensor (RMS). Automatic Music Sensor<sup>™</sup> (AMS) High speed Search, Index Search, and Shuffle Play.

Delete Shuffle Play permits removal of unwanted selections from shuffle sequence.

Program edit automatically calculates total playback times and enables you to easily arrange selections for pre-timed durations in advance.

5 repeat modes (single, all, RMS, Shuffle, A-B).

Music Calendar and Timekeeper displays provide complete disc playback information.

New 3" CD software can be played without adaptor ring.

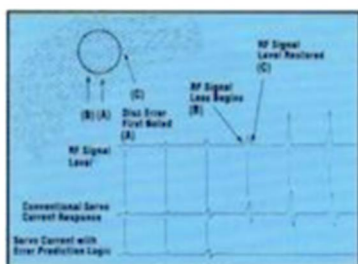
The CDP-707ESD and CDP-507ESD employ Sony's Linear Motor Tracking Mechanism which replaces conventional motor and gears with a much simpler, more precise system. It ensures fast access, accurate cueing, and smooth tracking with extremely low mechanical noise.

An exceptional CD player by any standard. With sophisticated engineering and a full complement of convenient control features, the CDP-307ESD delivers faultless musical performance that will please the most demanding listener.

## CDP-307ESD Compact Disc Player



Full-function 20-key wireless Remote Commander<sup>SM</sup> unit (supplied) provides total control of all operating and programming features, including variable line output.



Improved Error Prediction Logic<sup>™</sup> constantly monitors and predicts the location and duration of disc errors with a response time as fast as 1/8,000 second. Tracking and focus servos make adjustments before errors re-occur, improving tracking response and servo stability.

4X oversampling digital filter permits the use of a gently-sloped analog low-pass filter for smoother sound reproduction.

Dual 16-bit Linear D/A Converters, unlike single converter designs, permit both channels to be decoded simultaneously. With no interchannel time delay, stereo imaging is more precise and stable.

Direct Digital Output permits direct connection to digital inputs of present (such as DAS-703ES and TA-E77ESD) and future peripheral components.

Error Prediction Logic<sup>™</sup> (EPL) ensures superior tracking response and servo stability for improved handling of disc defects.

Monocoque chassis construction reduces mechanical vibrations

Left/Right Twin Mono circuit configuration ensures optimum channel separation and extremely low cross-channel interference.

6-Stage Multiple Power Supply design with two independent power transformers ensures extremely stable performance.

Custom File provides disc Memo, Program Bank, and Custom Index features. They let you program disc ID, desired selections/indexing for up to 226 discs. Programming is automatically recalled every time you load a disc.

20-key Direct Access<sup>™</sup> system enables instant track selection.

20-selection Random Music Sensor (RMS), Automatic Music Sensor<sup>™</sup> (AMS) High speed Search, Index Search, and Shuffle Play

Delete Shuffle Play permits removal of unwanted selections from shuffle sequence.

Program Edit automatically calculates total playback times.

5 repeat modes (single, all, RMS Shuffle, A-B) give you a variety of extended listening options.

Music Calendar and Timekeeper displays provide complete disc playback information.

New 3" CD software can be played without adaptor ring.

**ES** Series performance at a surprisingly affordable price. The CDP-207ESD delivers a high degree of technical refinement and control flexibility that makes it an outstanding value among CD players.

## CDP-207ESD Compact Disc Player



Full-function 20-key wireless Remote Commander® unit (supplied) provides total control of all operating and programming features.



1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

Music Calendar and Timekeeper displays provide complete disc playback information, elapsed/remaining time, and programming status at a glance.

**4X oversampling digital filter** permits the use of a gently-sloped analog low-pass filter for smoother sound reproduction.

**Dual 16-bit Linear D/A Converters**, unlike single converter designs, permit both channels to be decoded simultaneously. With no interchannel time delay, stereo imaging is more precise and stable.

**Direct Digital Output** permits direct connection to digital inputs of present and future peripheral components.

**Monocoque chassis construction** reduces mechanical vibrations and resonances that can color the reproduced sound.

**Left/Right Twin Mono** circuit configuration ensures optimum channel separation and extremely low

**6-Stage Multiple Power Supply** design with two independent power transformers ensures extremely stable performance and helps eliminate noise leakage between stages.

**20-key Direct Access™** system enables instant track selection.

**20-selection Random Music Sensor (RMS)**, Automatic Music Sensor™ (AMS), High-speed Search, Index Search, and Shuffle Play provide extensive playback programming and track access capabilities.

**Delete Shuffle Play** permits removal of unwanted selections from shuffle sequence.

**Program Edit** automatically calculates total playback times and enables you to easily arrange

**5 repeat modes** (single, all, RMS, Shuffle, A-B) give you a variety of extended listening options.

**Vibration-absorbing insulator feet** on ES Series CD players are yet another step to prevent external resonances from reaching the critical optical tracking system and low-level signal circuitry.

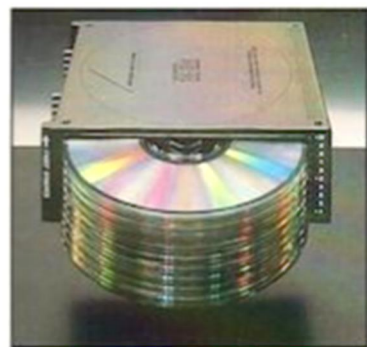
**New 3" CD software** can be played without adaptor ring.

A 10-disc CD changer with unsurpassed state-of-the-art performance. Featuring the DiscJockey<sup>®</sup> cartridge loading system first introduced by Sony, the CDP-C15ESD provides the ultimate in long-play convenience and full compatibility with car DiscJockey players, plus the most advanced technology and performance available on a CD changer today.

## CDP-C15ESD Compact Disc Changer



Full-function 10 + 10 key wireless Remote Commander CRG unit (supplied) provides total control of all operating and programming features, including variable line out put and disc selection.



Convenient 10-disc magazine minimizes disc handling and is fully compatible with other Sony DiscJockey home and car 10-disc changers. And unlike other magazine-loading systems, the Sony DiscJockey system lets you conveniently insert and play just one disc when you want to.

Sony's proprietary 18-bit, 8X oversampling digital filter design virtually eliminates "ripple" effects. High-frequency smoothness and detail are significantly improved.

Dual 18-bit linear D/A converters provides up to 4 times the resolution of conventional 16-bit designs. The music's full dynamic range is reproduced with superior accuracy and acoustic depth.

Direct Digital Output permits direct connection to digital inputs of present (such as DAS-703ES and TA-E77ESD) and future peripheral components.

Error Prediction Logic<sup>™</sup> (EPL) ensures superior tracking response and servo stability for improved handling of disc defects.

Left/Right Twin circuit configuration ensures optimum channel separation and extremely low cross-channel interference.

9-section Multiple Power Supply design with two independent power transformers ensures extremely stable performance and helps eliminate noise leakage between stages.

Custom File provides Disc Memo, Program Bank, and Custom Index features. They let you program disc ID, desired selections/indexing for up to 226 discs. Programming is automatically recalled every time you load a disc.

10 + 10 key Direct Access<sup>™</sup> enables virtually instant disc and track selection.

20-selection Random Music Sensor (RMS), Automatic Music Sensor<sup>™</sup> (AMS), High-speed Search, and Shuffle Play provide extensive playback programming and track access capabilities.

4 repeat modes (single, all, RMS, Shuffle) give you a variety of extended listening options.

Music Calendar and Timekeeper displays provide disc playback information, elapsed/remaining time, and programming status at a glance.

**5-disc changer** convenience with Sony's exclusive carousel design and superior audio performance. The CDP-C7ESD lets you load up to five discs with unequalled ease versus any other CD changer design for up to 6 hours of uninterrupted music. And that music will be nothing less than spectacular, thanks to Sony's unmatched digital audio technology.

## CPD-C7ESD Compact Disc Changer



Full-function 5 - 10 key wireless Remote Commander<sup>SM</sup> unit (supplied) provides total control of all operating and programming features, including variable line output and disc selection.



The 5-Disc Carousel design, a Sony innovation, is unequalled among CD changers for operating convenience and fast disc access. You can easily see which discs you have loaded, and changing discs is as easy as with single-disc players. You can even mix full-size and 3" CDs because Sony's design doesn't require adaptor rings for the new 3" CD software.

**4X oversampling digital filter** permits the use of a gently-sloped analog low-pass filter for smoother, sound reproduction.

**Dual 16-bit Linear D/A Converters**, unlike single converter designs, permit both channels to be decoded simultaneously. With no interchannel time delay, stereo imaging is more precise and stable.

**Direct Digital Output** permits direct connection to digital inputs of present and future peripheral components.

**Left/Right Twin Mono circuit configuration** ensures optimum channel separation and extremely low cross-channel interference.

**5-Stage Multiple Power Supply design** with two independent power transformers ensures extremely stable performance and helps eliminate noise leakage between stages.

**5-disc carousel loading system**, first introduced by Sony, has the fastest disc access time among today's CD changers. You can quickly see which discs are loaded and change discs as easily as with single disc players. No loading accessories are required, even with 3" CD software.

**Custom File** provides Disc Memo, Program Bank, and Custom Index features. They let you program disc ID, desired selection/indexing for up to 226 discs. Programming is automatically recalled every time you load a disc.

**5 + 10 key Direct Access<sup>SM</sup> system** enables rapid disc and track selection.

**20-selection Random Music Sensor (RMS), Automatic Music Sensor<sup>SM</sup> (AMS), High-speed Search, and Shuffle Play** provide extensive playback programming and track access capabilities.

**4 repeat modes** (single, all, RMS, Shuffle) give you a variety of extended listening options. With Shuffle Play, you can randomize selections within each disc or among all loaded discs.

**Music Calendar and Timekeeper displays** provide disc playback information, elapsed/remaining time, and programming status at a glance.

**New 3" CD software** can be played without adaptor ring.

# The finest music signals deserve the finest amplification.

The superb music signal provided by modern state-of-the-art sources, such as the Sony ES Series CD players, could easily lose its exciting impact and subtleties if handled by amplifiers of mediocre performance.

The Sony ES Series preamplifier, power amplifier, and integrated amplifiers represent the pinnacle of performance and versatility. Designed specifically to meet the demands of present and future digital audio equipment and program sources, these exceptional components deliver listening experiences rivaled only by live music.

In addition to the most advanced circuit design and the highest grade circuit components, ES Series amplifiers employ sophisticated layout and construction techniques — areas that are often neglected in traditional designs but, nonetheless, have significant effects on sonic quality. Epitomizing Sony's philosophy of "simple and straight" signal transfer, these components incorporate elaborate steps to minimize mutual interference among circuit stages and shorten the signal path.

Separate power supplies are used for the audio and system control sections. Microprocessor and D/A circuitry are housed in their own shielded cases. Video terminals and circuitry, where provided, are also completely separated from the audio section. This lavish design ensures outstanding versatility without exacting any penalties in musical definition and accuracy.

All ES Series power amplifier sections incorporate Sony's advanced Spontaneous Twin Drive (STD) design, which utilizes sep-



TA-E77ESD Chassis

arate power supplies for the voltage amplification and power output stages. It eliminates power supply fluctuations for the critical low-level voltage amplification circuitry even when the output stage is drawing heavy current. STD enables the amplifier to reproduce the full range of musical dynamics with detail and clarity. Bass reproduction is full, yet always "tight" and under control. The sound is always smooth and transparent — never tiring.

Also common to these exceptional components is Sony's exclusive G-Chassis™ construction, which utilizes a unique marble-like synthetic material. The G-Chassis design is exceptionally rigid, non-resonant, and non-magnetic. Distortions and colorations caused by vibrational and magnetic energies are thus virtually eliminated.

These uncommon construction and circuit design techniques result in a level of music reproduction quality that cannot be matched by conventional amplifiers. Sony ES Series amplifiers are, therefore, the ideal companions to Sony ES Series CD players and can serve as the control and power center for any state-of-the-art music system.

ENJOY TODAY'S IMPROVED FM BROADCASTS WITH STATE-OF-THE-ART TUNER TECHNOLOGY.

Sony ES Series tuners perfectly complement the refined performance of the ES Series amplifiers. Ultra-sophisticated Wave Optimizer technologies combat RF interference problems with unprecedented effectiveness while delivering a clean, low-distortion signal, even with more distant or weaker stations.

With more FM stations investing in new equipment, including CD players and improved transmitting systems, the quality of music over the airwaves is constantly being improved. Sony ES Series tuners will enable you to fully enjoy the benefits of modern broadcast technology.

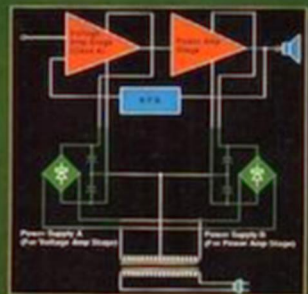


No-compromise engineering in the TA-N77ES power amplifier includes extensive use of the most sophisticated components and materials. Spontaneous Twin Drive design includes separate heavy-duty power supplies for the voltage amplification and power output stages. Massive chimney-style heat sinks are made of heavy-gauge extruded aluminum. G-Chassis™ construction damps extraneous vibrational and magnetic energy to preserve sonic purity.





*Spontaneous Twin Drive (STD) utilizes separate power supplies for the voltage amplification and power output stages. Each power supply is independently rectified and filtered with large capacitors. STD prevents fluctuations at the critical low-level stage even when the output stage is drawing heavy current. Even the most difficult musical signals are reproduced with full dynamics, detail, and clarity.*



A preamplifier for the audio perfectionist who demands state-of-the-art sonic performance and functional flexibility. Providing tremendous input/output versatility, the TA-E77ESD also incorporates the most advanced circuit design and construction techniques. And with its Programmable Remote Commander\* unit, you'll enjoy unparalleled ease of operation and total system control capability.

## TA-E77ESD Preamplifier



91-key Programmable Remote Commander unit (supplied) permits remote control of important preamplifier functions plus players, cassette decks, and video equipment — including those not manufactured by Sony. (See page 25 for more information.)



Direct Digital Inputs on TA-E77ESD preamplifier can be connected to digital outputs of CD players, DAT decks, PCM processors, and other future components. Employing a 4X oversampling digital filter and independent dual D/A converters, these inputs offer improved performance over built-in D/A and analog circuits of most digital source components.

Built-in D/A section employs 4X oversampling and independent dual D/A converters. By connecting the digital outputs of CD players, DAT decks, and other future components, you can bypass excess analog circuitry and improve the performance of many such components.

Decodes all digital music data sampled at either 48 kHz, 44.1 kHz or 32 kHz providing improved performance and the ultimate in flexibility.

Full Audio/Video Switching Capability — 3 digital inputs, 1 digital output, a digital processing loop, 3 video inputs, 2 video outputs, and a video monitor output are provided. All audio and video sources are easily selected via front panel controls or via the wireless Remote Commander unit.

S-Video Terminals, compatible with new high-resolution video components (e.g., ED Beta™ and S-VHS VCRs), separate the luminance (Y) and color chroma (C) signals to provide a cleaner picture with less interference. S-Video terminals are provided in addition to conventional composite video signal connectors.

Source Direct switch lets you bypass all tone control, balance, and filter circuitry to achieve the most direct signal path.

A total of 12 input sources provides extensive system control flexibility and expandability.

Passive tone control circuitry uses only capacitive and resistive components to avoid signal degradation associated with conventional active-type tone controls.

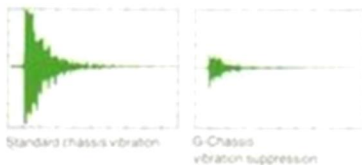
REC OUT selector permits independent selection of listening and recording sources for greater operating versatility.

Adaptor terminals permit connection of external sound processor (e.g., graphic equalizer) without using tape monitor loop.

3-mode cartridge selection permits use of a variety of phone cartridges, including low-output moving coil types.

A power amplifier capable of reproducing the full dynamic range of live music with unprecedented clarity and impact. The TA-N77ES features lavish construction and no-compromise engineering. It incorporates the latest Sony amplifier technology that enables it to handle even the most demanding speaker loads and deliver audibly superior, satisfying music reproduction.

## TA-N77ES Power Amplifier



The non-metallic G-Chassis™ construction used in Sony ES Series amplifiers is approximately 3,000 times more rigid than a conventional steel chassis design. The substantial reduction in transmitted vibrations results in the virtual elimination of minute audio modulations that rob typical amplifiers of sonic purity.

**STD (Spontaneous Twin Drive)** power supply design prevents fluctuations at the critical low-level voltage amplification stage even when the output stage is drawing heavy current. The result is smooth, transparent sound throughout the entire dynamic range.

**Low impedance drive capability** provides generous power reserves of 270 Watts per channel continuous output at 4 ohms, 20–20,000 Hz, 0.006% THD; 200 Watts per channel continuous output at 8 ohms, 20–20,000 Hz, 0.004% THD; with a 4-ohm dynamic headroom of 2.8dB.

**Monaural operation** delivers 580 Watts at 8 ohms, 20–20,000 Hz, 0.007% THD.

**Large chimney-style heat sinks** with massive, thick aluminum construction ensures efficient thermal transfer and effectively dampens resonances that can cause sonic coloration.

**Fixed and variable inputs** provide maximum connection flexibility. High-quality input attenuators permit direct connection of CD players and other sources for the ultimate in "simple and straight" signal reproduction.

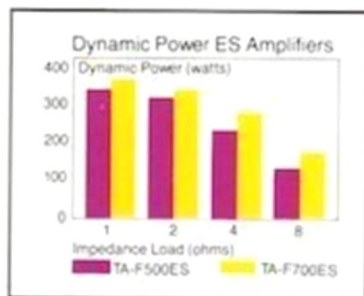
**Two independent protection circuits** with indicator lamp afford extensive yet unobtrusive speaker and amplifier protection.

**Large peak level power meters** are exceptionally easy to read. Meters and lights can be turned off if desired.

**2 sets of speaker terminals** with front panel A/B/A + B switching increase system configuration versatility.

An amplifier of uncompromising musical accuracy. Capable of delivering astonishingly clean, solid power, the TA-F700ES combines the versatility and performance of a state-of-the-art preamplifier and power amplifier. The result is a flexible system control center/amplifier that reproduces the fine detail and tremendous dynamics of digital audio with consummate transparency and ease.

## TA-F700ES Integrated Amplifier



Low-Impedance Drive capability enables ES Series to deliver high current with stable consistency to virtually any load, even at 1 ohm. Large amounts of clean, undistorted power are always available, even for speakers of low and/or complex impedances.

140 Watts per channel continuous output at 4 ohms, 20-20,000Hz, 0.008% THD; 105 Watts per channel continuous output at 8 ohms, 20-20,000Hz, 0.004% THD.

STD (Spontaneous Twin Drive) power supply design prevents fluctuations at the critical low-level voltage amplification stage even when the output stage is drawing heavy current. The result is smooth, transparent sound throughout the entire dynamic range.

G-Chassis™ base is molded of a unique, marble-like poly-resin fiber-reinforced compound that is exceptionally rigid and totally non-magnetic. It virtually eliminates the distortions and colorations caused by undesirable resonances and magnetic energy.

Source Direct switch lets you bypass all tone control, balance, and filter circuitry to achieve the most direct signal path.

Phono input is fully compatible with moving-magnet and moving-coil cartridges.

Passive tone control circuitry (with switch-selectable bass and treble turnover frequencies) maintains high signal integrity.

Independent record output selector lets you tape one signal source while listening to another.

Defeatable subsonic filter removes harmful ultra-low-frequency signals, such as those caused by turntable rumble or record warps.

Numerous inputs and outputs plus flexible front panel switching capabilities are included with connections for 3 tape decks for dubbing. Also provided are terminals for 2 speaker pairs with A/B/A+B switching.

An audibly superior integrated amplifier. Generous power reserves and innovative Sony amplifier technology distinguishes the TA-F500ES. Its superb preamplifier and power amplifier sections deliver ES Series performance, which does justice to the finest digital and analog sources.

## TA-F500ES Integrated Amplifier



100 Watt per channel continuous output at 4 ohm, 20-20,000Hz, 0.01% THD; 80 Watts per channel continuous output at 8 ohms, 20-20,000Hz, 0.006% THD.

STD (Spontaneous Twin Drive) power supply design prevents fluctuations at the critical low-level voltage amplification stage even when the output stage is drawing heavy current. The result is smooth, transparent sound throughout the entire dynamic range.

G-Chassis™ base is molded of a unique, marble-like poly-resin fiber-reinforced compound that is exceptionally rigid and totally non-magnetic. It virtually eliminates the distortions and colorations caused by undesirable resonances and magnetic energy.

Source Direct switch lets you bypass all tone control, balance, and filter circuitry to achieve the most direct signal path.

Phono input is fully compatible with moving-magnet and moving-coil cartridges.

Passive tone control circuitry maintains a high signal integrity.

Independent record output selector lets you tape one signal source while listening to another.

Defeatable subsonic filter removes undesirable and potentially harmful ultra-low-frequency signals, such as those caused by turntable rumble or record warps.

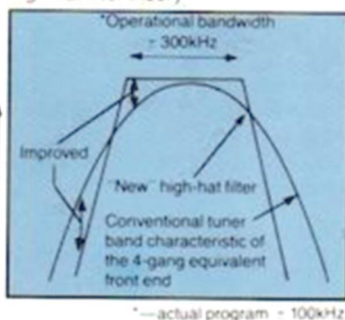
Numerous inputs and out-puts plus flexible front panel switching capabilities are included with connections for 2 video sources and tape with dubbing. Also provided are terminals for 2 speaker pairs with A/B/A+B switching.

Incomparable FM reception quality. The ST-S700ES is a tuner that ensures the best possible reception for full enjoyment of today's finest-quality FM broadcasts. It features the full complement of Sony's unique Wave Optimizer technologies for superb performance even in difficult reception areas.

## ST-S700ES Stereo Tuner



High-hat filter theory



Super Sound Tracking (SST) front end design achieves nearly ideal "high-hat" filter characteristics by shifting the center of the filter with the frequency modulations. This provides the improved selectivity of a narrow filter without the normally associated distortions. It thus ensures superior signal clarity even in "crowded" reception areas.

Super Sound Tracking (SST) circuitry greatly improves front-end tracking and provides the advantages of a narrower filter without any of the associated drawbacks. The result is clearer reception, even in difficult areas.

Wave Optimized IF System (WOIS) automatically selects optimum filter characteristics based on signal condition. You always get the lowest possible distortion without interference.

Wave Optimized Direct Detector (WODD) solves the problem of non-linearity in conventional PLL (phase-locked loop) designs with a precise compensating circuit. Noise and distortion in the PLL detector are significantly reduced.

Wave Optimized Digital Stereo Decoder (WODSD) effectively suppresses high-frequency interference without the need for beat-cut filters that invariably distort the signal. It ensures stereo FM reception of exceptional clarity.

Exclusive Direct Comparator circuitry provides the accuracy of quartz frequency-synthesis tuning without the commonly associated "pre-scaling" noise.

Timer program capability permits preselection of up to 4 stations for sequential unattended recording.

10 station memory presets gives you instant, one-button recall of your favorite stations.

Multi-process memory "remembers" various tuner settings for each preset station.

Memory Scan gives you a 4-second sample of each preset station.

Calibration tone facilitates pre-setting of record levels when taping off the air.

Advanced technology for improved FM performance. The ST-S500ES is able to provide superior FM reception under a wide variety of signal conditions. It features many of Sony's most advanced tuner technologies to ensure outstanding sonic quality with today's improving FM broadcasts.

## ST-S500ES Stereo Tuner



Wave Optimized Digital Stereo Decoder (WODSD) effectively suppresses high-frequency interference without the need for beat-cut filters that invariably distort the signal. It ensures stereo FM reception of exceptional clarity.

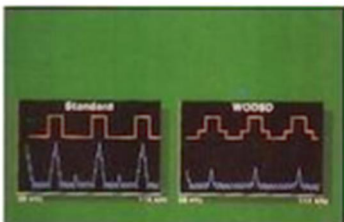
Exclusive Direct Comparator circuitry provides the accuracy of quartz frequency-synthesis tuning without the commonly associated "pre-scaling" noise.

Timer program capability permits preselection of up to 4 stations for sequential unattended recording.

10 station memory presets gives you instant, one-button recall of your favorite stations.

Multi-process memory "remembers" various tuner settings for each preset station.

Calibration tone facilitates pre-setting of record levels when tapping off the air.



Sony's unique Wave Optimized Digital Stereo Decoder (WODSD) uses high-frequency switching techniques to remove spurious harmonics without the need for a conventional beat-cut filter. It thus effectively suppresses high-frequency interference without introducing phase and amplitude distortions.

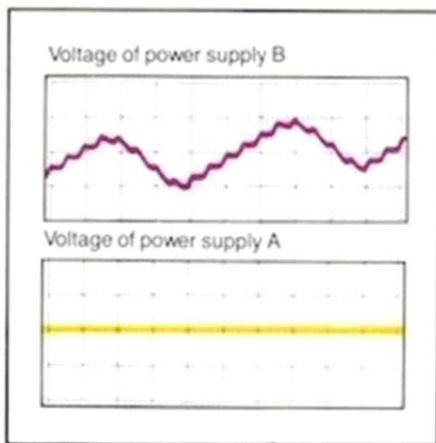
Sony ES Series receivers are crafted to the same high standards of excellence as ES Series CD players and amplifier/tuner separates. Now, you can enjoy all the traditional advantages of receivers — reduced space requirement and ease of system integration and installation — without compromise in performance or versatility.

Incorporating the sophisticated circuit designs and construction techniques of Sony ES Series separate components, these receivers reproduce music with convincing accuracy. And they provide a full complement of operating conveniences, including Sony's advanced **Programmable Remote Commander**® unit (full-function unit Commander® remote control on the STR-GX5ES). Five models offer a wide range of control features and versatility, so that there is an ES Series receiver that's perfect for virtually every system requirement.

The tuner sections of these receivers feature **Quartz Frequency Synthesis** AM/FM tuning, which ensures precise, drift-free station selection and provides a convenient digital station frequency display. **Station Memory** allows you to preset up to 20 of your favorite AM and FM stations for instant recall at the touch of a key. The STR-GX9ES and STR-GX10ES include Sony's acclaimed **Direct Comparator** circuitry, which employs an ultra-high-speed PLL IC that eliminates the need for pre-scaling. Compared to conventional frequency synthesis designs, it delivers a quieter, cleaner signal. Also incorporated in these two models is the **Wave Optimized Digital Stereo Decoder (WODSD)**, another Sony innovation that eliminates the need for conventional beat-cut filters and their attendant phase and amplitude distortions.

## Now, you can get a receiver with uncompromising ES Series performance.

As with the ES Series integrated and power amplifiers, the amplifier sections of the ES Series receivers all include Sony's novel **Spontaneous Twin Drive (STD)** design. It eliminates power supply fluctuations for the earlier voltage amplification circuitry regardless of any heavy current demands at the power output stage. This ensures accurate reproduction of musical detail and dynamics even under signal load conditions that would cripple many competitive amplifier designs.



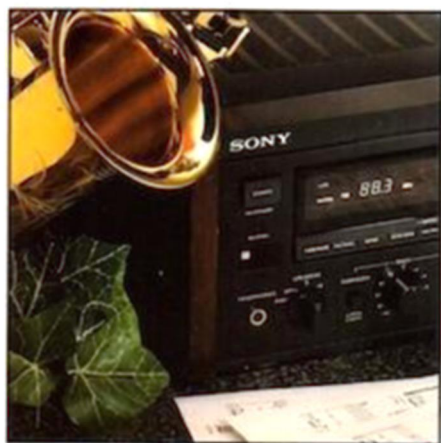
Oscilloscope photos show stability of power supply A while power supply B draws heavy current.

All amplifier sections also feature a discrete output stage design with oversize heat sinks. This design incorporates **Low Impedance Drive Capability**, which enables the amplifier sections to deliver their full power to a variety of real-world speaker loads with extremely low distortion.

The circuit layout follows Sony's "straight & simple" design philosophy to maximize signal integrity. And all ES Series receivers provide a **Source Direct** switch that lets you completely bypass the filter, tone and balance control circuitry to achieve the most direct, coloration-free signal path.

And, as with separate components, the ES Series receivers all feature Sony's proven **G-Chassis**™ design. The heavy, acoustically inert, non-metallic synthetic material used in the G-Chassis design greatly reduces mechanical vibrations and resonances that can cause subtle, but audible loss of musical detail.

With uniquely sophisticated technology and outstanding operating conveniences, the ES Series receivers are clearly designed for the music lover who demands nothing less than state-of-the-art performance.





All Sony ES Series receivers feature pure complementary-symmetry amplifier sections with discrete output transistors rather than cost-saving integrated circuits. Copper-plated frame on the STR-GX10ES receiver shields low-level circuitry from stray magnetic fields. Lack of typical production shortcuts make an audible difference: Sony ES Series receivers simply sound



A receiver at the leading edge of audio technology. The STR-GX10ES is truly a prodigious performer with unsurpassed sonic quality, generous power reserves, and an unusually wide range of system control capabilities. With its powerful Programmable Remote Commander® unit, it is an ideal control center for a state-of-the-art audio/video home entertainment system.

## STR-GX10ES Receiver



Programmable Remote Commander® unit (supplied) allows remote operation of your entire audio/video system from anywhere in the room. "Learn" mode makes it compatible with virtually any infrared remote controlled component, including those not manufactured by Sony.



ES Series receivers with S-Video terminals can take full advantage of the new high-resolution ED Beta™ and S-VHS VCRs and video components. S-Video connections separate the luminance (Y) and color chroma (C) components to prevent degradation of the video signal through mutual interference.

150 Watts per channel continuous output at 8 ohms, 20–20,000Hz, 0.007% THD

STD (Spontaneous Twin Drive) power supply design prevents fluctuations at the critical low-level voltage amplification stage even when the output stage is drawing heavy current.

G-Chassis™ design employs a specially developed non-metallic compound that is exceptionally rigid, non-resonant, and non-magnetic. It reduces colorations caused by vibrations and stray magnetic fields.

Separate power transformers for the system control and audio circuit stages plus 5 independent power supply regulator sections greatly reduce electrical interference.

Extensive audio/video switching capability includes front panel and remote control selection of 3 video sources, tuner, turntable, CD player, DAT, 2 tape decks, and auxiliary input. Video and tape dubbing functions are also included.

Special S-Video terminals permit high-resolution connections to new video components, such as ED Beta™ and S-VHS VCRs.

Phono input is fully compatible with moving-magnet and moving-coil cartridges.

Tape output selector lets you record one signal source while listening to another.

Defeatable subsonic filter removes harmful ultra-low-frequency signals.

3-band, low-noise, high-gain negative feedback type tone controls have switchable bass and treble turnover frequencies to permit precise tailoring of spectral balance.

Source Direct switch lets you bypass all tone control, balance, and filter circuitry to achieve the most direct signal path.

Quartz Frequency Synthesis AM/FM tuning with Direct Comparator.

WODSD (Wave Optimized Digital Stereo Decoder) effectively suppresses high-frequency interference without the use of distortion-causing beat-cut filters.

Station Memory lets you preset up to 20 of your favorite stations for instant recall.

An outstanding combination of refined power and versatility. With most of the features of the top-of-the-line STR-GX10ES, the STR-GX9ES provides outstanding high-powered performance for the sophisticated home entertainment system.

## STR-GX9ES Receiver



Programmable Remote Commander® unit (supplied) allows remote operation of your entire audio/video system from anywhere in the room. "Learn" mode makes it compatible with virtually any infrared remote controlled component, including those not manufactured by Sony.



ES Series receivers are designed to serve as the heart of a complete multimedia home entertainment system. The STR-GX9ES provides extensive A/V control capability with 3 video sources in addition to a full complement of audio sources. Audio and video tape dubbing functions are also included.

130 Watts per channel continuous output at 8 ohms, 20-20,000Hz, 0.007% THD

STD (Spontaneous Twin Drive) power supply design prevents fluctuations at the critical low-level voltage amplification stage even when the output stage is drawing heavy current.

G-Chassis™ design employs a specially developed non-metallic compound that is exceptionally rigid, non-resonant, and non-magnetic.

Separate power transformers for the system control and audio circuit stages plus 5 independent power supply regulator sections greatly reduce electrical interference for exceptionally clear music reproduction.

Extensive audio/video switching capability includes front panel and remote control selection of 3 video sources, tuner, turntable, CD player, DAT, additional tape deck, and auxiliary input. Video and tape dubbing functions are also included.

Special S-Video terminals permit high-resolution connections to new video components, such as ED Beta™ and S-VHS VCRs.

Phono input is fully compatible with moving-magnet and moving-coil cartridges.

Independent tape output selector lets you record one signal source while listening to another.

Defeatable subsonic filter removes harmful ultra-low-frequency signals.

Three band, low-noise, high-gain negative feedback type tone controls have switchable bass and treble turnover frequencies to permit precise tailoring of spectral balance.

Source Direct switch lets you bypass all tone control, balance, and filter circuitry to achieve the most direct signal path.

Quartz Frequency Synthesis AM/FM tuning with Direct Comparator.

WODSD (Wave Optimized Digital Stereo Decoder) effectively suppresses high-frequency interference without the use of distortion-causing beat-cut filters. The result is smooth, clean stereo FM reception.

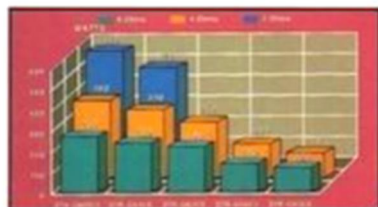
Station Memory lets you preset up to 20 of your favorite stations.

Sophisticated audio and video control capability with clean, undistorted power. Featuring innovative Sony technology and S-Video terminals, the STR-GX7ES is the perfect choice for the music lover who demands the finest in audio reproduction and video performance.

## STR-GX7ES Receiver



Programmable Remote Commander<sup>®</sup> unit (supplied) allows remote operation of your entire audio/video system from anywhere in the room. "Learn" mode makes it compatible with virtually any infrared remote controlled component, including those not manufactured by Sony.



ES Series receivers have power amplifiers with **Low Impedance Drive Capability**, a decided advantage in the real world of complex speaker loads. High 4-ohm dynamic power output figures demonstrate the receivers' ability to deliver full, undistorted power regardless of signal or speaker load.

120 Watts per channel continuous output at 8 ohms, 20-20,000Hz, 0.008% THD

STD (Spontaneous Twin Drive) power supply design prevents fluctuations at the critical low-level voltage amplification stage even when the output stage is drawing heavy current. The result is smooth, transparent sound throughout the entire dynamic range.

G-Chassis™ design employs a specially developed non-metallic compound that is exceptionally rigid, non-resonant, and non-magnetic. It reduces colorations caused by vibrations and stray magnetic fields.

Separate power transformers for the system control and audio circuit stages plus 4 independent power supply regulator sections greatly reduce electrical interference and noise leakage for exceptionally clear music reproduction.

Complete audio/video switching capability includes front panel and remote control selection of 3 video sources, tuner, turntable, CD player, DAT, and additional tape deck.

Special S-Video terminals permit high-resolution connections to new video components, such as ED Beta™ and S-VHS VCRs. Use of S-Video cabling prevents degradation of the color video signal.

Independent tape output selector lets you record one signal source while listening to another.

Low-noise, negative feedback type tone controls permit adjustment of spectral balance while preserving high signal quality.

Source Direct switch lets you bypass all tone control, balance, and filter circuitry to achieve the most direct signal path.

Quartz Frequency Synthesis AM/FM tuning ensures precise station selection.

Station Memory lets you preset up to 20 of your favorite stations for instant recall.

Exceptional performance and advanced operating convenience. The STR-GX6ES offers the unsurpassed versatility of Sony's Programmable Remote Commander<sup>3</sup> and more than ample power output for high-quality home entertainment systems. Delivering superb ES Series performance at a modest price, the STR-GX6ES represents an outstanding value.

## STR-GX6ES Receiver



Programmable Remote Commander<sup>3</sup> unit (supplied) allows remote operation of your entire audio/video system from anywhere in the room. "Learn" mode makes it compatible with virtually any infrared remote-controlled component, including those not manufactured by Sony.



All power amplifier sections of Sony ES Series receivers feature discrete output transistors in a high-current design that provides Low Impedance Drive Capability. You get full power, distortion-free performance regardless of variations in load, even with speakers of low and complex impedances.

100 Watts per channel continuous output at 8 ohms, 20-20,000Hz, 0.03% THD

STD (Spontaneous Twin Drive) power supply design prevents fluctuations at the critical low-level voltage amplification stage even when the output stage is drawing heavy current. The result is smooth, transparent sound throughout the entire dynamic range.

G-Chassis<sup>™</sup> design employs a specially developed non-metallic compound that is exceptionally rigid, non-resonant, and non-magnetic. It reduces colorations caused by vibrations and stray magnetic fields.

Separate power transformers for the system control and audio circuit stages plus 4 independent power supply regulator sections greatly reduce electrical interference and noise leakage for exceptionally clear music reproduction.

Complete audio/video switching capability includes front panel and remote control selection of 2 video sources, turner, turntable, CD player, DAT, and an additional tape deck.

Independent tape output selector lets you record one signal source while listening to another.

Low-noise, negative feedback type tone controls permit adjustment of spectral balance while preserving high signal quality.

Source Direct switch lets you bypass all tone control, balance, and filter circuitry to achieve the most direct signal path.

Quartz Frequency Synthesis AM/FM tuning ensures precise station selection.

Station Memory lets you preset up to 20 of your favorite stations for instant recall.

**ES** Series performance and quality in a highly affordable receiver. Built to Sony's exacting ES Series standards of quality and performance, the STR-GX5ES is an excellent choice for the critical listener with moderate system requirements.

## STR-GX5ES Receiver



Full-function RM-U80 wireless Remote Commander<sup>®</sup> unit (supplied), when used with other compatible Sony remote-control components, gives you fingertip control virtually your entire audio/video system.



80 Watts per channel continuous output at 8 ohms, 20-20,000Hz, 0.08% THD

STD (Spontaneous Twin Drive) power supply design prevents fluctuations at the critical low-level voltage amplification stage even when the output stage is drawing heavy current. The result is smooth, transparent sound throughout the entire dynamic range.

ES Series receivers make it easy to select a desired station. 10-key Direct Access<sup>™</sup> system lets you change stations simply by entering the frequency on the 10-digit keypad. You can also preset up to 20 of your most frequently tuned stations in Station Memory for instant recall at the touch of a key.

G-Chassis<sup>™</sup> design employs a specially developed non-metallic compound that is exceptionally rigid, non-resonant, and non-magnetic. It reduces colorations caused by vibrations and stray magnetic fields.

Separate power transformers for the system control and audio circuit stages plus 4 independent power supply regulator sections greatly reduce electrical interference and noise leakage for exceptionally clear music reproduction.

Audio/video switching capability includes front panel and remote control selection of a video source, tuner, turntable, CD player, DAT, and an additional tape deck.

Low-noise, negative feedback type tone controls permit adjustment of spectral balance while preserving high signal quality.

Source Direct switch lets you bypass all tone control, balance, and filter circuitry to achieve the most direct signal path.

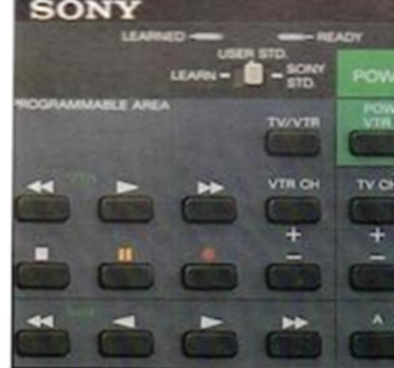
Quartz Frequency Synthesis AM/FM tuning ensures precise station selection.

Station Memory lets you preset up to 20 of your favorite stations for instant recall.

The Sony ES Series TA-E77ESD preamplifier comes with a 91-key RM-E7 Programmable Remote Commander's unit. All ES Series receivers except the STR-GX5ES include the 55-key RM-P103 Programmable Remote Commander unit.

These sophisticated handheld units permit operation of all major preamplifier/receiver

## Programmable Remote Controls



Learn/User Std/Sony STD switch.



functions plus VCRs, tape decks, CD players, tuners, turntables, televisions, and virtually any other component (regardless of brand) with infrared wireless remote control capability.

With Sony ES Series Programmable Remote Commander units, you no longer have to "juggle" several remote controls to operate your various components. Instead, a single, handheld wireless unit gives you master control of your entire audio/video entertainment center from the comfort of your easy chair.

It's easy to use the Programmable Remote Commander's unit. To program the infrared digital transmission code of another remote controller, simply set the switch to "LEARN" and hold down the desired key on the Programmable Remote Commander unit. The "READY" indicator will light. Then aim the other remote controller at the Programmable Remote Commander unit (head-to-head) and press the key whose function you want to transfer. When the "READY" light comes on, release the keys, and you're done.

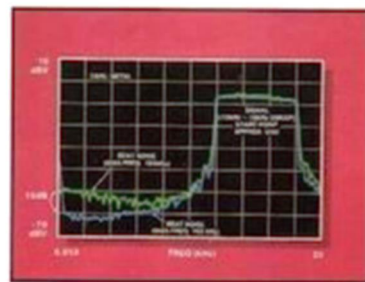
Now, with the switch in the "USER STD." position, the newly defined key on the Programmable Remote Commander unit duplicates the function of the key you pressed on the other remote controller. Any key on the Programmable Remote Controller unit that you do not assign in this manner will automatically default to the Sony Standard (for remote-controlled ES Series components).

# Sony—uniquely qualified to bring you magnetic recording at its best.

Sony's extensive research and expertise in magnetic recording encompasses the widest array of hardware and tape applications in the industry, including professional and consumer products for audio, video, and even data. Sony engineers thus possess a unique understanding of the complex, delicate nature of the magnetic recording and playback process.

It should not be surprising, therefore, that Sony ES Series cassette decks represent unsurpassed technical excellence and sonic performance. Each deck is an engineering tour de force, with 20–20,000Hz ( $\pm 3$ dB) frequency response and reproduction accuracy that meets the challenge of today's vastly improved digital program sources. Thoughtfully designed with a multitude of superb contours and operating conveniences, the ES Series cassette decks are the perfect choice for the advanced recording enthusiast as well as the music lover being introduced to the joys of taping.

All ES Series cassette decks (except the 3-head TC-K700ES) feature Sony's Super Bias™ technology, which employs a super-high-frequency recording bias signal to improve high-speed dubbing performance on double decks and reduce beat-frequency noise in all decks. Most good cassette decks use a recording bias of 105kHz to minimize the "beating" of high-frequency audio signals with the bias signal. Even with a 105kHz bias, however, some beating noise remains in the audible spectrum. Sony ES Series cassette decks use a bias frequency of 160kHz (210kHz in the TC-WR11ES double deck), which results in a significant reduction of the remaining beat-frequency noise. With less inherent noise, recordings sound cleaner and less distorted.

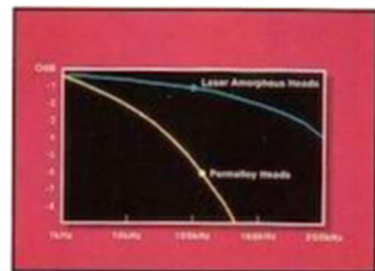


Measurement of noise levels demonstrate reduction of beat-frequency noise with Sony Super Bias™ circuitry.

Super Bias circuitry has an added advantage in double decks when high-speed dubbing is used. When tape speed is doubled, so are the audio frequencies. To avoid beat-frequency problems, most double decks cut off the highest audio frequencies during high-speed dubbing, which results in audible sonic degradation. But thanks to Super Bias circuitry, Sony ES Series double decks can deliver vastly superior high-frequency performance during high-speed dubbing.

The key to Super Bias technology is Sony's extraordinary LaserAmorphous Head, also common to all ES Series decks. It features laser-welded laminations made from an amorphous (non-crystalline) material that possesses nearly ideal magnetic characteristics. The LaserAmorphous head easily handles the ultra-high-frequency bias signals whereas conventional heads would suffer severe distortions due to magnetic saturation. The LaserAmorphous head also exhibits far superior linearity and lower noise. And its physical hardness makes it one of the longest-lasting heads available. When combined with Sony's superb Direct-Coupled

Electronics, the result is lower noise and distortion, wider dynamic range, and extended high-frequency response.



Sony's unique LaserAmorphous Head exhibits nearly ideal physical and magnetic characteristics. Compared to conventional heads, the LaserAmorphous Head delivers far superior linearity and lower noise. It is a key element in the 20–20,000Hz ( $\pm 3$ dB) frequency response performance common to all ES Series cassette decks.

Standard on all ES Series decks, of course, is Dolby® B and C noise reduction, which enhances the decks' inherent low-noise performance. The TC-RX80ES and TC-RX60ES additionally feature Dolby HX PRO circuitry, which extends high-frequency headroom performance by dynamically adjusting recording bias according to the music's high-frequency content. It lets you record music with strong highs at a higher level without losing the original clarity and brilliance.

Exceptional tape deck performance is the rule at Sony. The ES Series cassette decks are capable of such high reproduction accuracy that you'll find it nearly impossible to distinguish the recording from the original. As part of a high-end home music system, an ES Series deck will add immeasurable pleasure and satisfaction to your listening experience.



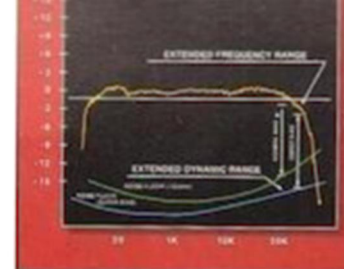


ES Series cassette decks with the Linear Counter digital display provide "real time" indication of tape position. This not only simplifies location of desired selections, but also eliminates having to "guess" how much time remains on a cassette.



A state-of-the-art auto-reverse deck. The TC-RX80ES is undoubtedly one of the finest cassette decks ever made. Engineered with advanced features that ensure the best possible recordings under virtually any condition, it is the perfect deck for high-end home music systems.

## TC-RX80ES Cassette Deck



Super Bias™ circuitry, a technology unique to Sony, is possible only with exceptional head technology such as the Laser-Amorphous type found on the TC-RX80ES cassette deck. It also has 20Hz-20kHz frequency response by lowering the residual noise floor, so there is no effect on dynamic range.



20-20,000Hz  $\pm$  3dB frequency response with 160kHz Super Bias™ circuitry ensures smooth, accurate reproduction of the entire audio spectrum.

Advanced 2-motor transport with Feather Touch controls uses a precision DC servo motor for the capstan and a separate high-torque motor for the reel hubs.

Quick Auto Reverse, for both record and playback, engages the reversing mechanism without playing through the tape leader. Direction changes are thus made with virtually no interruption.

State-of-the-art Laser-Amorphous Head gives you smooth, extended highs with lower noise and distortion.

Dolby® B and C noise reduction circuitry virtually eliminates tape hiss without annoying audible side effects.

Dolby® HX PRO dynamically adjusts recording bias to assure optimum high-frequency headroom extension.

5-band Spectrum Analyzer provides a visual indication of musical content across the audio band. It can help you make bias adjustments and provides useful additional information for the accurate setting of record levels.

Linear Counter provides "real time" indication of tape position.

Record Level Calibration automatically puts 10 seconds of test tone on tape, then rewinds and plays the tone, allowing you to easily make any needed adjustments.

Variable Bias allows you to further fine-tune the deck's high-frequency response for optimum performance.

Automatic tape type selection eliminates the need to manually set bias/equalization switches.

Automatic Music Sensor™ (AMS) skips back to the start of the current selection or to the next selection.

Blank Skip automatically fast forwards when there is more than 10 seconds of blank space on the tape.

Music Scan samples the first 10 seconds of every selection on the tape.

Auto Space Record Mute enables you to consistently space your recorded selections.

Timer Record/Play permits unattended record or playback when you use an external program timer.

Remote Control Capability enables you to operate the deck from anywhere in your room. (Requires Sony remote-controlled receiver equipped with SIRCS connector, such as all ES Series receivers.)

A 3-head cassette deck for the serious recording enthusiast. The TC-K700ES features highly sophisticated design and construction, and the most advanced magnetic head, tape transport, and electronic technologies in the industry. It is yet another masterpiece, reflecting Sony ES Series design philosophy.

## TC-K700ES Cassette Deck



Featuring a true 3-head design, the TC-K700ES has separate record and play Laser Amorphous Heads. Unlike typical "combination" heads, this deck's heads are mounted in an Independent Suspension assembly that permits them to be individually aligned at the factory. It ensures an exceptional degree of phase accuracy and high-frequency performance that cannot be matched by decks using combination heads.

20-20,000  $\pm$  3dB frequency response ensures smooth, accurate reproduction across the entire audio spectrum.

Mid-ship Drive System employs a lavishly constructed chassis where the system control and audio circuitry are physically separated by a central inner sub-chassis, which houses the transport mechanism and power supply. The layout eliminates electrical interference and excessive internal wiring, while the high structural rigidity helps control undesirable vibrations and resonances.

Professional 3-head design with separate erase, record, and play heads permits independent optimization of record and playback performance and lets you monitor the tape as you record.

Closed-loop Dual Capstan Transport ensures optimum tape tension and tape-to-head contact under all conditions.

Quartz-lock Direct Drive on the take-up side capstan and flywheel employs Sony's superb 3-phase linear-torque BSL (brushless/slotless) motor for steady tape travel and remarkably low wow and flutter: less than 0.025% (WRMS).

Dolby B/C noise reduction system uses Dual Symmetry IC for simplified, efficient circuitry.

Linear Counter provides "real-time" indication of tape position and has a "subtract" function for remaining time display.

Memory stop/play halts the transport or begins playback when the counter reaches "0.00" during rewind.

Automatic tape type selection eliminates the need to manually set bias/equalization switches.

MPX filter switch lets you remove the 19 kHz carrier signal that can cause errors in Dolby system tracking when taping FM stereo broadcasts.

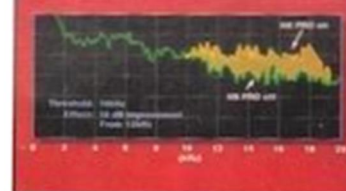
Auto Play automatically puts transport into play mode after rewind.

Auto Space Record Mute facilitates consistent spacing between recorded selections.

Timer Record/Play permits unattended record or playback when you use an external program timer.

Outstanding performance and control capability. With advanced operating conveniences and faultless sonic performance, the TC-RX60ES auto-reverse deck makes cassette recording and playing a truly pleasurable experience.

## TC-RX60ES Cassette Deck



Dolby® HX PRO circuitry on the TC-RX80ES and TC-RX60ES dynamically adjusts recording bias to the music's high frequency content. The resulting improvement in headroom permits higher recording levels without the danger of high-frequency saturation. You thus gain dynamic range without sacrificing the clarity and brilliance of the original.



20–20,000Hz  $\pm$  3dB frequency response with 160kHz Super Bias™ circuitry ensures smooth, accurate reproduction of the entire audio spectrum with significantly less beat-frequency noise than decks with conventional bias.

Advanced 2-motor transport with Feather Touch controls uses a precision DC servo motor for the capstan and a separate high-torque motor for the reel hubs. This design delivers dependable, steady tape travel.

Quick Auto Reverse, for both record and playback, engages the reversing mechanism without playing through the tape leader. Direction changes are thus made with virtually no interruption. You can choose single or continuous auto reverse with a convenient front panel switch.

Sony's state-of-the-art Laser-Amorphous Head gives you smooth, extended highs with lower noise and distortion. It ensures exceptional sound quality with all tape types.

Dolby® B and C noise reduction circuitry virtually eliminates tape hiss without annoying audible side effects. The Dolby C system helps prevent high-frequency tape saturation and can improve signal-to-noise by as much as 20dB.

Dolby HX PRO dynamically adjusts recording bias to assure optimum high-frequency headroom extension. Music with strong highs can be recorded at higher levels without loss of clarity or brilliance.

Linear Counter provides "real time" indication of tape position.

Automatic tape type selection eliminates the need to manually set bias/equalization switches.

Automatic Music Sensor™ (AMS) lets you jump back to the start of the current selection or skip to the next selection.

Blank Skip automatically fast winds ahead and plays the next recorded selection when there is more than 10 seconds of blank space on the tape. It also speeds up the auto reverse process.

Music Scan lets you sample the first 10 seconds of every selection on the tape.

Auto Space Record Mute enables you to consistently space your recorded selections.

Timer Record/Play permits unattended record or playback when you use an external program timer.

Remote Control Capability enables you to operate the deck from anywhere in your room. (Requires Sony remote-controlled receiver equipped with SIRCS connector, such as all ES Series receivers.)

Top performance and value in an auto-reverse cassette deck. The TC-RX50ES provides uncompromised sound quality and superior operating features you won't easily find, even on cassette decks costing far more.

## TC-RX50ES Cassette Deck



20-20,000Hz  $\pm$  3dB frequency response with 160kHz Super Bias™ circuitry ensures smooth, accurate reproduction of the entire audio spectrum with significantly less beat-frequency noise than decks with conventional bias.

Feather Touch transport controls assure fast, easy, fingertip operation.

Auto Reverse with choice of single or continuous operation gives you extended, uninterrupted music enjoyment.

Sony's state-of-the-art Laser-Amorphous Head gives you smooth, extended highs with lower noise and distortion. It ensures exceptional sound quality with all tape types.

Dolby® B and C noise reduction circuitry virtually eliminates tape hiss without annoying audible side effects. The Dolby C system helps prevent high-frequency tape saturation and can improve signal-to-noise by as much as 20dB.

Electronic digital counter helps you locate recorded selections.

3-position tape selector lets you record on normal (ferric), high-bias (CrO<sub>2</sub> or equivalent), and metal tapes.

High-speed cue in both fast-forward and rewind engages the play head during shuttling to let you quickly locate a desired selection.

Auto Space Record Mute enables you to consistently space your recorded selections.

Timer Record/Play permits unattended record or playback when you use an external program timer.

Built-in microphone inputs let you use the deck to make "live" recordings.

Remote Control Capability enables you to operate the deck from anywhere in your room. (Requires Sony remote-controlled receiver equipped with SIRCS connector, such as all ES Series receivers.)



Full-logic Feather Touch controls not only make it easy to select the various transport functions, but also let you change tape directions and shift between play and fast wind without first having to hit "stop." The logic circuitry allows you to select transport functions in any sequence without fear of jamming a cassette.

Sony ES Series double cassette decks each incorporate two transports that you can use in a variety of ways to enhance your recording and listening pleasure. And, as with all ES Series decks, they represent a degree of technical refinement that separate them from conventional products.

The top-of-the-line TC-WR11ES sets new standards for double deck performance and versatility. Utilizing Sony's most advanced magnetic recording technology, it is unsurpassed in musical reproduction accuracy. And its ultrasophisticated operating features give it virtually unlimited capabilities while providing the ultimate ease of operation.

20-20,000Hz  $\pm$  3dB frequency response ensures smooth, accurate reproduction across the entire audio spectrum.

210kHz Super Bias™ circuitry eliminates the need for high-cut filters found in conventional double decks with high-speed dubbing capability. The ultra-high-frequency bias signal prevents beat-frequency noise, especially when tape speed is doubled. Even at normal speed, the reduction of beat-frequency noise results in cleaner, more transparent sound.

4-motor design utilizes two motors per transport. Each transport has one high-quality BSL (brushless/slotless) DC servo-controlled motor for the capstan and a separate high-torque motor for the reel hubs. This ensures long-term dependability and extremely low wow and flutter.

Feather Touch transport controls on both A and B decks ensures easy, jamproof operation.

## TC-WR11ES Double Cassette Deck

**Quick Auto Reverse**, for both record and playback on both transports, engages the reversing mechanism without playing through the tape leader. Direction changes are thus made with virtually no interruption. You can choose single or continuous auto reverse with a convenient front panel switch.

**Twin/Sequential Recording** is possible because both A and B decks have record capability. Twin recording lets you simultaneously make two identical cassettes. Sequential recording automatically starts deck B after deck A has finished to give you extended uninterrupted record time.

**High-speed dubbing** cuts recording time in half. High-frequency response and signal-to-noise ratio remain excellent, even at twice the normal tape speed.

Both decks A and B feature Sony's state-of-the-art **LaserAmorphous Head**, which delivers smooth, extended highs with lower noise and distortion. It ensures exceptional sound quality with all tape types.

**Twin Dolby®** noise reduction lets you independently set the NR function (Dolby B NR, Dolby C NR, or no NR) for each of the two decks. You can even take advantage of this feature when you use high-speed dubbing.

**Dubbing level control** lets you independently adjust record level for the dubbing deck. You can thus adjust for optimum levels with different tape formulations.

**Relay Play** starts playing the tape in deck B at the end of the last selection on deck A. This provides longer uninterrupted playback, especially when combined with auto reverse.

**Auto Pause** automatically pauses the record deck at the end of the musical selection on the playback deck.

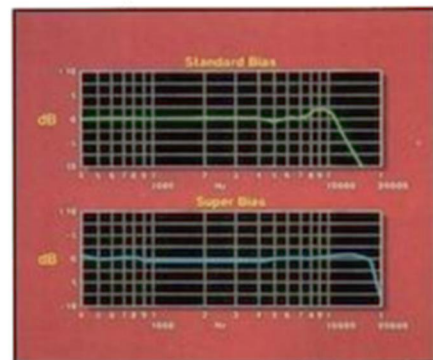
**Linear Counter** keeps track of tape position in both decks and displays either tape position in minutes and seconds at the touch of a button.

**Automatic Music Sensor® (AMS)** lets you jump back to the start of the current selection or skip to the next selection.

**Blank Skip** automatically fast winds ahead and plays the next recorded selection when there is more than 10 seconds of blank space on the tape. It also speeds up the auto reverse process.

**Automatic tape type selection** eliminates the need to manually set bias/equalization switches.

**Remote Control Operation** of both decks with the supplied RM-950 Remote Commander®. Both decks can also be controlled with the RM-U80 A/V remote and RM-P103 Programmable Remote Control supplied with Sony ES Receivers.



210kHz Super Bias® circuitry employed in the TC-WR11ES double deck results in vastly superior high-frequency response when dubbing at high speed. Because all frequencies are effectively doubled during high-speed dubbing, most decks must use a high-frequency cutoff filter to prevent beat-frequency noise. Super Bias circuitry, found in all Sony ES Series double decks, makes high-quality high-speed dubbing possible.



The supplied RM-950 Remote Control features an A/B switch to control either deck's main front-panel operating functions. Also, Memory and Reset buttons for the linear counter help locate memorized points on the tape.



Full-featured, state-of-the-art double deck performance. With Super Bias™ circuitry, LaserAmorphous Heads, dual full-logic auto reverse transports, and an extensive range of flexible control options, the TC-WR9ES is unquestionably one of the finest double decks ever engineered.

## TC-WR9ES Double Cassette Deck



All Sony ES Series cassette decks have separate power supplies for the control and audio circuitry. This prevents extraneous noise from leaking into the audio signal.



20-20,000Hz  $\pm 3$ dB frequency response ensures smooth, accurate reproduction across the entire audio spectrum.

160kHz Super Bias™ circuitry reduces beat-frequency noise and eliminates the need for drastic high-cut filters that impair high-frequency performance in typical high-speed dubbing decks.

2-motor design utilizes an independent motor for each transport.

Feather Touch transport controls on both A and B decks ensures easy, jamproof operation.

Quick Auto Reverse, for both record and playback on both transports, engages the reversing mechanism without playing through the tape leader.

High-speed dubbing cuts recording time in half. Although real-time (normal speed) dubbing always yields the best results, Sony's high-speed dubbing feature with new innovative technology lets you save time with no significant loss of sound quality.

Both decks A and B feature Sony's state-of-the-art Laser-Amorphous Head, which delivers smooth, extended highs with lower noise and distortion.

Relay Play starts playing the tape in deck B at the end of the last selection on deck A. This provides longer uninterrupted playback, especially when combined with auto reverse.

Auto Pause automatically pauses the record deck at the end of the musical selection on the playback deck.

Electronic digital counter keeps track of tape position in both decks and displays either at the touch of a button.

Automatic Music Sensor™ (AMS) lets you jump back to the start of the current selection or skip to the next selection.

Blank Skip automatically fast winds ahead and plays the next recorded selection when there is more than 10 seconds of blank space on the tape.

Automatic tape type selection on Deck A.

Remote Control Capability enables you to operate the deck from anywhere in your room. (Requires Sony remote-control receiver equipped with SIRC connector, such as all ES Series receivers.)

An economically priced double deck with high-end performance. The TC-W7ES gives you sophisticated ES Series cassette deck technology and advanced features, such as 2-motor design, full-logic Feather Touch control transports, Super Bias™ circuitry, and Automatic Music Sensor™ (AMS). It thus easily outperforms most other double decks in its price class.

## TC-W7ES Double Cassette Deck



20–20,000Hz  $\pm$  3dB frequency response ensures smooth, accurate reproduction across the entire audio spectrum.

160kHz Super Bias™ circuitry reduces beat-frequency noise and eliminates the need for drastic high-cut filters that impair high-frequency performance in typical high-speed dubbing decks. Even at normal speed, the reduction of beat-frequency noise results in cleaner, more transparent sound.

2-motor design utilizes an independent motor for each transport. Compared to single-motor designs, the Sony 2-motor double deck system provides greater reliability, superior tape handling, and improved wow-and-flutter performance.

Feather Touch transport controls on both A and B decks ensure

High-speed dubbing cuts recording time in half. Although real-time (normal speed) dubbing always yields the best results, Sony's high-speed dubbing feature lets you save time with no significant loss of sound quality.

Both decks A and B feature Sony's state-of-the-art Laser-Amorphous Head, which delivers smooth, extended highs with lower noise and distortion. It ensures exceptional sound quality with all tape types.

Relay Play starts playing the tape in deck B at the end of the last selection on deck A. This provides longer uninterrupted playback.

Electronic digital counter keeps track of tape position in both decks and displays either at the

Automatic Music Sensor™ (AMS) lets you jump back to the start of the current selection or skip to the next selection.

Blank Skip automatically fast winds ahead and plays the next recorded selection when there is more than 10 seconds of blank space on the tape.

Automatic tape type selection on deck A eliminates the need to manually set playback equalization. 3-position tape type selector on deck B lets you record on normal (ferric), high-bias (CrO<sub>2</sub> or equivalent), and metal tapes.

Remote Control Capability enables you to operate the deck from anywhere in your room. (Requires Sony remote-controlled receiver equipped with SIRCS connector, such as all ES Series

# SEQ-333ES Program Equalizer

The perfect equalizer for less-than-perfect listening environments. The SEQ-333ES is an "intelligent" remote control equalizer that automatically adjusts for room acoustics. Incorporating 10 bands of equalization with realtime spectrum analysis, it is a sophisticated component that greatly enhances your listening pleasure.

3 inputs and outputs ensure flexible system configuration options.

8 acoustic memories with 4 pre-programmed curves for the most popular listening conditions let you store multiple equalizer settings for instant recall.

Choice of automatic or manual equalization provides maximum versatility.

Built-in battery backup protects all programmed equalization settings.



The SEQ-333ES comes with a test microphone for automatic equalization. Simply place the phone at any desired listening position and depress the auto equalizer microphone will feed the reprogrammed pink noise back to the SEQ-333 microprocessor circuitry for a 10-band room equalization.



Full function wireless Remote Commander<sup>®</sup> unit included.



# DAS-703ES Digital-To-Analog Converter

A step into the future of digital audio. The DAS-703ES is an outboard digital-to-analog (D/A) converter featuring automatic selection of four different sampling rates. Designed to decode digital signals with uncompromising accuracy, the DAS-703ES delivers reproduction of stunning clarity and definition with present and future components that have direct digital outputs.

*Optical Transfer System* ensures superior analog/digital isolation for clear, noise-free audio.

*Dual D/A Converters* eliminate interchannel time delay and assures stable, accurate stereo imaging.

*Separate large-capacity power transformers* for digital and analog circuitry increase power supply stability and reduce interference and noise.

*Double PLL Clock System* provides improved decoding accuracy.

*Left/Right Dual Monaural con-*

*4 automatically selected sampling rates* — 32 kHz, 44.056 kHz, and 48 kHz, — ensures compatibility with most digital audio sources, such as CD players, PC 4M processors and future PCM broadcasts and digital audio tape recorders (DAT).

*Digital Monitor Switch* provides increased flexibility for future applications.

*Use of ultra-high-grade, selected circuit components and LC-OFC (Linear Crystal, Oxygen-Free Copper) audio signal wiring* assures matchless sonic purity and uncolored reproduction.

Add dramatic new dimensions to your audio/video enjoyment. The Sony SDP-777ES is a truly remarkable component—the first ever to combine advanced digital delay circuitry with Dolby Surround Sound™ Pro-Logic™ decoding. It brings convincing, “you are there” realism and impact to home entertainment, whether it’s listening to your favorite music, enjoying a video concert, watching sports, or viewing a movie.

## SDP-777ES Digital Surround Processor



The SDP-777ES comes with a versatile Remote Commander<sup>®</sup> unit that lets you select video source, surround mode, center and surround channel levels, volume, and bass level. You can even invert phase, activate the test tone, and adjust delay time (either independently for the L and R channels or in tandem). You can make the surround listening experience “just right” without ever leaving the comfort of your chair.

Full 16-bit linear quantization digital processing with advanced 48kHz sampling rate assures superb sound quality. You get the exceptionally wide dynamic range, low noise and distortion, and uniform frequency response.

Sophisticated digital signal processing ensures superior sound quality. The A/D and D/A converters are synchronized to a single master clock to prevent spurious noise. Delay circuits utilize a costly static RAM design for lower noise. The low pass filtering required for Dolby Surround Sound decoding is handled in the digital domain for exceptionally phase-linear, distortion-free performance.

Advanced Dolby Pro-Logic circuitry recreates the professional Dolby Stereo™ movie theater experience in your home when viewing video movies and other specially encoded program sources. The Dolby Pro-Logic system delivers far greater channel separation (left-center-right and front-rear) than the basic Dolby Surround Sound decoders used in most consumer components. You can now enjoy the multi-dimensional realism of Dolby Surround Sound entertainment from a much wider listening area.

Special enhancements to Dolby Pro-Logic circuits adjust signal delay time based on level. Constant level signals in the front channels, for example, will not be noticeably modulated by a rear channel transient. Surround effects are free from sudden level changes and sound much more natural.

Switch selectable configuration lets you use 4 or 5 speakers for Dolby Surround Sound playback. 5-speaker configuration allows you to add a front center channel for more stable imaging. A built-in subsonic filter permits a smaller speaker to be used for the center channel.

Advanced power supply design uses both positive and negative supply rails for the Dolby Pro-Logic circuitry. This ensures superior reproduction of program dynamics and reduces distortion.

Built-in test tone (pink noise) generator with unique test modes simplify the setting of channel balance. With 5 speakers, the test tone circulates sequentially from channel to channel. With 4 speakers, the tone alternates between front and rear channels with a gradually diminishing rear signal.

you simply press a key. You can set and change channel balance at any time with the remote control.

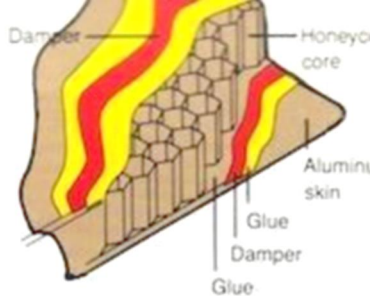
3-built-in delay modes can enhance the playback of any conventional audio source or video sound. “Matrix” delay simulates large stadium-type environments. “Hall” delay reproduces concert hall ambience. “Stereo simulator” mode enhances playback of monaural sources.

Built-in video switching capability lets you connect up to four video sources and a video monitor for total A/V control. S-Video terminals are provided for video inputs 1 and 2 plus the monitor output to new high-resolution video components.

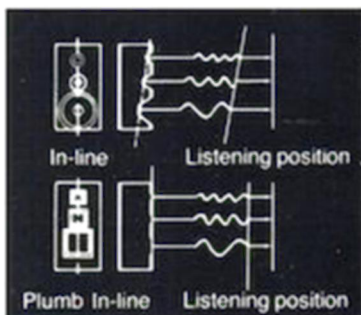
Audio outputs are provided for connection to front and rear channel stereo power amplifiers. A third stereo power amplifier can be connected to the center channel and subwoofer outputs for multi-channel A/V home entertainment.

Speakers ideally suited to digital audio reproduction. Incorporating Sony's exclusive APM (Accurate Pistonic Motion) driver technology, the APM-66ES and APM-22ES possess extremely wide dynamic range, near-perfect linearity, high power handling capability, and exceptionally low distortion. All qualities are essential for the convincing reproduction of modern digitally mastered program sources.

## APM-66ES/APM-22ES Speakers



\*Cutaway diagram showing construction of APM diaphragm.



The flat APM speakers' Plumb In-line Configuration assures all of the music is propagated from a single plane. Because the sound arrives at your ears without frequency-dependent time delays, you'll enjoy more precise stereo imaging and the accurate reproduction of spatial relationships among the individual sound sources in a recording.

APM drivers solve the problems of "cavity effect," ragged dispersion, uneven response, internal resonances, and diaphragm break-up typical of conventional cone-type units. They also have much greater dynamic range and power handling than most planar designs, such as electrostatic and ribbon types.

Proprietary APM tweeter in the APM-66ES features a thin layer of amorphous diamond deposited onto the flat aluminum honeycomb diaphragm. This results in not only great stiffness, but also extremely high sound propagation speed. Phase cancellations are largely eliminated, enabling the APM tweeter to reproduce frequencies ranging to 40,000Hz and above with exceptionally uniform dispersion.

Multi-Point Direct Dual-Surface Drive prevents sectional diaphragm vibrations and applies equal force to both the front and back surfaces of the diaphragm. The woofer in the APM-66ES speaker, for example, is driven at no less than 8 points, which ensures more efficient energy transfer and reduces harmonic distortion to levels far lower than that of conventional cone drivers.

The result is cleaner, less tiring, more transparent sound.

Advanced crossover design ensures smooth response and stable stereo imaging over entire frequency range.

Built-in circuit breaker protects the tweeter from excessively high signals.

Heavy-duty cabinet construction with rounded edges reduces diffraction effects to assure pinpoint-accurate stereo imaging with excellent acoustic depth.

Optional speaker stands available.

\*Sony's APM Driver is constructed of an extremely light and rigid aluminum honeycomb material. It is nearly 1,000 times stiffer than ordinary diaphragms. This high rigidity makes it possible to design a flat driver that is free of "cavity effect," exhibited by conventional cone drivers. The APM diaphragm is also well damped and exhibits virtually no internal resonances that can alter reproduction accuracy.

FEATURE/SPECIFICATIONS  
COMPACT DISC PLAYERS

DESIGN	SINGLE				CHANGER	
	CDP-707ESD	CDP-507ESD	CDP-307ESD	CDP-207ESD	CDP-C15ESD	CDP-C7ESD
Sampling (kHz):	352.8	352.8	176.4	176.4	352.8	176.4
Quantization:	18 Bit	16 Bit	16 Bit	16 Bit	18 Bit	16 Bit
D/A Converter:	2	4	2	2	2	2
Power Supply:	14	9	6	6	10	4
Transformers:	2	Dual Windings	Dual Windings	Dual Windings	Dual Windings	Dual Windings
Error Protection:	EPL II	EPL II	EPL	EDD	EPL	EDD
Digital Output:	Optical/Coaxial	Optical/Coaxial	Yes	Yes	Optical/Coaxial	Yes
Chassis:	Copper Base	Copper Base	Monocoque	Monocoque	-	-
Linear Motor:	Yes, Die Cast	Yes, Ceramax	-	-	-	-
Variable Line Out:	Yes	Yes	Yes	-	Yes	Yes
<b>PLAY FUNCTIONS</b>						
RMS Programming:	20	20	20	20	19 x 90	32
Repeat Play:	5 (A-B)	5 (A-B)	5 (A-B)	5 (A-B)	4	4
Shuffle Play:	w/Delete	w/Delete	w/Delete	w/Delete	Yes	Yes
High Speed Search:	Yes	Yes	Yes	Yes	Yes	Yes
3 Play Modes:	Yes	Yes	Yes	Yes	Yes	-
Auto Space:	Yes	Yes	Yes	Yes	Yes	-
Program Edit:	Yes	Yes	Yes	Yes	-	-
<b>REMOTE</b>						
Direct Access:	Yes (20)	Yes (20)	Yes (20)	Yes (20)	Yes (10 + 10)	Yes (5 + 10)
Programming:	Yes	Yes	Yes	Yes	Yes	Yes
Volume:	Yes	Yes	Yes	-	Yes	Yes
<b>DISPLAY</b>						
Music Calendar:	20	20	20	20	20	20
No. of Digits:	10	10	10	8	10	10
No. of Time Displays:	5	6	6	6	5	4
Next Track No.:	Yes	Yes	Yes	Yes	-	-
<b>MISCELLANEOUS</b>						
Gold Plated Outputs:	4	4	-	-	4	-
Oversize Feet:	Large	Large	Large	Medium	Large	Medium
<b>MODEL</b>						
Frequency Response:	2 Hz-20kHz, ± 3 dB	2 Hz-20kHz, ± 3 dB	2 Hz-20kHz, ± 3 dB	2 Hz-20kHz, ± 3 dB	2 Hz-20kHz, ± 3 dB	2 Hz-20kHz, ± 1 dB
S/N Ratio:	115 dB	110 dB	104 dB	102 dB	115 dB	100 dB
Dynamic Range:	100 dB	97 dB	95 dB	95 dB	100 dB	90 dB
Harmonic Distortion (1kHz):	.0015%	.0025%	.003%	.003%	.0015%	0.05%
Separation (1kHz):	110 dB	100 dB	95 dB	95 dB	110 dB	95 dB
Wow and Flutter:	Below Measurable Limits				Below Measurable Limits	
Line Out:	2 uv/10k ohms	2 uv/10k ohms	2 uv/10k ohms	2 uv/10k ohms	2 uv/10k ohms	2 uv/10k ohms
Impedance:	2 uv/50k ohms	2 uv/50k ohms	2 uv/50k ohms	-	2 uv/50k ohms	2 uv/50k ohms
Headphone Output/Impedance:	28 mw/32 ohms	28 mw/32 ohms	28 mw/32 ohms	28 mw/32 ohms	28 mw/32 ohms	28 mw/32 ohms
Dimensions (WHD):	18 3/8" x 5" x 14 1/2"	17" x 4 3/8" x 13 1/2"	17" x 4 1/4" x 13 1/2"	17" x 4 1/4" x 13 1/2"	18 3/8" x 4 3/8" x 14 3/8"	17" x 4 3/8" x 13 1/2"
Weight:	39 lbs., 11 oz.	15 lbs., 4 oz.	12 lbs., 6 oz.	10 lbs., 6 oz.	14 lbs., 9 oz.	12 lbs., 10 oz.
Remote Control:	RM-D650	RM-D650	RM-D650	RM-D650	RM-D105	RM-D75

INTEGRATED AMPLIFIERS

MODEL	TA-F700ES	TA-F500ES
G Chassis:	Yes	Yes
Low Impedance:	Yes, 2 ohms	Yes, 2 ohms
STD:	Yes	Yes
Source Direct Switch:	Yes	Yes
Record Out Selector:	Yes	Yes
Number of Inputs:	7	7
Subsonic Filter:	Yes, 15Hz	Yes, 15Hz
Passive Controls:	Yes	Yes
Turnover Points:	Yes, 200/400, 3k/6k	-
Tone Control By-Pass:	Yes	-
Muting:	Yes, 20 dB	Yes
A, B, A + B Speaker Switching:	Yes	Yes
Power (8 ohms, 20-20k):	105	80
THD:	.004%	.006%
Continuous Power (4/8):	140, .008%/120, .006%	100, .01%/90, .008%
Head Room (4/8):	3 dB/2 dB	2 dB/1.2 dB
Damping:	100	50
Slew Rate:	250v/125v	250v/125v
Power Bandwidth:	10 Hz - 100kHz	10 Hz - 100kHz
Frequency Response: Phono (RIAA)	(± 2 dB)	(± 2 dB)
CD:	2Hz - 200kHz (+ 0 - 3 dB)	2Hz - 200kHz (+ 0 - 3 dB)
S/N Ratio:	87	86
CD:	105	105
<b>MISCELLANEOUS</b>		
Power Consumption:	330 watts	210 watts
Dimensions (WHD):	17" x 6 3/8" x 17 1/4"	17" x 5 3/4" x 14 1/4"
Weight:	40 lbs., 6 oz.	29 lbs., 1 oz.

TUNERS

MODEL	ST-S700ES	ST-S500ES
Direct Comparator:	Yes	Yes
SST Front End:	Yes	-
Wave Optimized IF:	Yes	-
Wave Optimized Direct:	-	-
Detector:	Yes	-
Wave Optimized Digital Stereo Decoder:	Yes	Yes
10 Station Multi Process Memory:	Yes	Yes
Memory Scan:	Yes	-
Program Timer Capability:	Yes	-
Record Calibration Tone:	Yes	Yes
S/N Ratio (Stereo/Mono):	91 dB/96 dB	84 dB/88 dB
THD (Mono/Stereo):	.005%/0.005%	.06%/0.08%
Sensitivity (Mono):	10.3 dBf/9 uv	10.3 dBf/9 uv
50 dB Quieting - Mono:	16.8 dBf/1.8	16.8 dBf/1.8
Stereo:	37.9 dBf/22.5	37.9 dBf/22.5
Selectivity (400kHz):	90 dB	90 dB
Separation (1kHz):	65 dB	60 dB
Frequency Response:	15Hz - 15kHz (+ 2 - .5 dB)	15Hz - 15kHz (+ 2 - .5 dB)
Capture Ratio:	1 dB	1 dB
I F Rejection:	120 dB	120 dB
Spurious Rejection:	120 dB	120 dB
Image Rejection:	80 dB	80 dB
<b>MISCELLANEOUS</b>		
Power Consumption:	17 watts	12 watts
Dimensions (WHD):	17" x 3 3/8" x 13 3/8"	17" x 3 3/8" x 13 3/8"
Weight:	9 lbs., 13 oz.	9 lbs., 5 oz.

GENERAL FEATURES	STR-GA10ES	STR-GA20ES	STR-GA25ES	STR-GA30ES	STR-GA35ES
G Chassis:	Yes	Yes	Yes	Yes	Yes
Low Impedance Capable:	Yes, 2 ohms	Yes, 2 ohms	Yes, 4 ohms	Yes, 4 ohms	Yes, 4 ohms
STD:	Yes	Yes	Yes	Yes	Yes
Source Direct Switch:	Yes	Yes	Yes	Yes	Yes
Remote Control:	Prgrm RM-P103	Prgrm RM-P103	Prgrm RM-P103	Prgrm RM-P103	A/V, RM-U80
S Video Capable:	Yes	Yes	Yes	Yes	Yes
Pre Amp Out:	Yes	Yes	Yes	Yes	Yes
Record Out Selector:	Yes	Yes	Yes	Yes	Yes
Copper Plated Chassis:	Yes	Yes	Yes	Yes	Yes
Wood Side Panels:	Yes	Yes	Yes	Yes	Yes
Motorized Volume:	Yes	Yes	Yes	Yes	Yes
Video Inputs:	3	3	3	2	1
<b>AMPLIFIER</b>					
Power Transformer:	Dual (Audio, Signal)	Dual (Audio, Signal)	Dual (Audio, Signal)	Dual (Audio, Signal)	Dual (Audio, Signal)
Transformer (VA):	320	300	260	200	170
STD:	Yes	Yes	Yes	Yes	Yes
Super Legato Linear:	Yes	Yes	Yes	Yes	Yes
Amplifier Design:	Pure Complimentary	Pure Complimentary	Pure Complimentary	Pure Complimentary	Pure Complimentary
Discrete Outputs:	Yes	Yes	Yes	Yes	Yes
Power Supply Regulator:	5	5	4	4	4
Pre Amp Design:	Low Noise, High Gain	Low Noise, High Gain	Low Noise	Low Noise	Low Noise
<b>TUNER</b>					
Direct Comparator:	Yes	Yes	Yes	Yes	Yes
Wdsd:	Yes	Yes	Yes	Yes	Yes
Auto Tuning:	H/Low	H/Low	—	—	—
Presets:	20	20	20	20	20
<b>AMPLIFIER</b>					
Power (8 ohms, 20-20k):	130	130	120	100	80
THD:	.007%	.007%	.008%	.03%	.08%
Dynamic Power (2/4/8):	330/330/230	470/310/200	-7230/190	-7190/140	-7130/120
Head Room:	1.85 dB	1.85 dB	2 dB	2 dB	2 dB
Damping:	60	60	60	60	60
Slew Rate:	125v/230v	125v/230v	30v	30v	40v
Power Bandwidth:	5 Hz-60kHz	5 Hz-60kHz	5 Hz-60kHz	5 Hz-60kHz	5 Hz-60kHz
Frequency Response Phono (RIAA):	(±.3 dB) 2 Hz-20kHz (±0-3 dB)	(±.3 dB) 2 Hz-20kHz (±0-3 dB)	(±.5 dB) 5 Hz-80kHz (±.1 dB)	(±.5 dB) 5 Hz-80kHz (±.1 dB)	(±.5 dB) 5 Hz-80kHz (±.1 dB)
S/N Ratio:	90 dB 105 dB	90 dB 105 dB	74 dB 100 dB	74 dB 100 dB	74 dB 100 dB
<b>TUNER:</b>					
S/N Ratio (Mono/Stereo):	88 dB/84 dB	88 dB/84 dB	82 dB/76 dB	82 dB/76 dB	82 dB/76 dB
THD (Mono/Stereo):	.06%/.08%	.06%/.08%	.1%/2%	.1%/2%	.1%/2%
Sensitivity (Mono):	10.3 dBf/9 uv	10.3 dBf/9 uv	11.2 dBf/2 uv	11.2 dBf/2 uv	11.2 dBf/2 uv
50 dB Quieting - Mono:	16.8 dBf/1.8	16.8 dBf/1.8	18.3 dBf/4.5	18.3 dBf/4.5	18.3 dBf/4.5
Stereo:	37.9 dBf/22.5	37.9 dBf/22.5	38.3 dBf/4.5	38.3 dBf/4.5	38.3 dBf/4.5
Selectivity (400kHz):	90 dB	90 dB	65 dB	65 dB	65 dB
Separation (1kHz):	60 dB	60 dB	30 dB	30 dB	30 dB
Frequency Response:	15 Hz-15kHz (±.2-.5 dB)	15 Hz-15kHz (±.2-.5 dB)	15 Hz-15kHz (±.5-1.5 dB)	30 Hz-15kHz (±.5-1.5 dB)	30 Hz-15kHz (±.5-1.5 dB)
Capture Ratio:	1 dB	1 dB	1.2 dB	1.2 dB	1.2 dB
I F Rejection:	120 dB	120 dB	90 dB	90 dB	90 dB
Spurious Rejection:	120 dB	120 dB	100 dB	100 dB	100 dB
Image Rejection:	80 dB	80 dB	80 dB	80 dB	80 dB
<b>MISCELLANEOUS</b>					
Power Consumption:	250 watts	290 watts	210 watts	170 watts	150 watts
Dimensions (WHD):	17" x 6 1/2" x 17 1/2"	17" x 6 1/2" x 17 1/2"	17" x 5 1/2" x 14 1/2"	17" x 5 1/4" x 14 1/2"	17" x 5 1/4" x 14 1/2"
Weight:	38 lbs., 8 oz.	37 lbs., 7 oz.	18 lbs., 1 oz.	15 lbs., 14 oz.	17 lbs., 6 oz.

## CASSETTE DECKS

MODEL	SINGLE				DUAL		
	TC-K700ES	TC-RX80ES	TC-RX60ES	TC-RX50ES	TC-WR11ES	TC-WR9ES	TC-W7ES
Type:	Auto Reverse	3 Head	Auto Reverse	Auto Reverse	Auto Reverse	Auto Reverse	Auto Reverse
Bias:	160kHz	105kHz	160kHz	160kHz	210kHz	160kHz	160kHz
Heads:	Laser Amorphous	Laser Amorphous	Laser Amorphous	Laser Amorphous	Laser Amorphous	Laser Amorphous	Laser Amorphous
Controls:	Feather Tch	Feather Tch	Feather Tch	Feather Tch	Feather Tch	Feather Tch	Feather Tch
Display:	Fluorescent	Fluorescent	Fluorescent	Fluorescent	Fluorescent	Fluorescent	Fluorescent
Remote Capable:	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dolby:	HX Pro, B, C	B, C	HX Pro, B, C	B, C	Dual, B, C	B, C	B, C
# Heads:	2	3	2	2	2	2	2
# Motors:	2	2	2	2	4	2	2
# Capstan:	2	4	2	2	4	4	2
Record Calibration:	Yes	Yes	—	—	—	—	—
Bias Calibration:	Yes	Yes	—	—	—	—	—
Spectrum Analyzer:	Yes	—	—	—	—	—	—
<b>CONVENIENCE</b>							
High Speed Dub:	—	—	—	—	Yes	Yes	Yes
Auto Reverse:	Yes (Quick)	—	Yes (Quick)	Yes	Yes (Quick)	Yes (Quick)	—
AMS:	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Synchro Record:	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Soft Eject:	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Timer Switch:	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Relay Play:	—	—	—	—	Yes	Yes	Yes
Dubbing Level Control:	—	—	—	—	Yes	—	—
Microphone Input:	—	—	—	Yes	—	—	—
Frequency Response: (±.3 dB, RE: -20 dB) Type IV (Metal)	20Hz-20kHz	20Hz-20kHz	20Hz-20kHz	20Hz-20kHz	20Hz-20kHz	20Hz-20kHz	20Hz-20kHz
Wow & Flutter: % (WRMS NAB JIS)	0.025%	0.05%	0.09%	0.08%	0.05%	0.09%	0.09%
% (W, PEAK)	0.04%	0.07%	0.13%	0.13%	0.07%	0.13%	0.13%
Signal to Noise Ratio: (1% THD, Peak Wtd) Dolby NR Off: Type IV (Metal) dB	60 dB	59 dB	58 dB	58 dB	59 dB	58 dB	58 dB
Dolby C NR On: Type IV (Metal) dB	73 dB	72 dB	71 dB	71 dB	72 dB	71 dB	71 dB
Input Sensitivity: Line x 2 (4.7k ohms) dB	-20 dB	-20 dB	-20 dB	-20 dB	-20 dB	-20 dB	-20 dB
	77.5 mV	77.5 mV	77.5 mV	77.5 mV	77.5 mV	77.5 mV	77.5 mV
Output Level: Line x 2 (4.7k ohms) dB	-5 dB	-5 dB	-5 dB	-5 dB	-5 dB	-5 dB	-5 dB
	440 mV	440 mV	440 mV	440 mV	440 mV	440 mV	440 mV
Headphone Level: (8 ohms)	-20 dB	-20 dB	-20 dB	-20 dB	-20 dB	-28 dB	-20 dB
Dimensions (WHD):	17" x 5" x 13 1/2"	17" x 4 5/8" x 11 3/4"	17" x 4 5/8" x 10"	17" x 4 5/8" x 10"	17" x 5 1/2" x 11 3/4"	17" x 4 5/8" x 10"	17" x 4 5/8" x 10"

**PREAMPLIFIER: TA-E77ESD**

<b>CONVERTER SECTION</b>	
Digital input (phono jacks): Input level (sensitivity) Impedance	0.5 V <sub>p-p</sub> ± 20% (SPIF) 75Ω The input signal comes unprocessed the digital output terminals via a buffer, only when the TA-E77ESD is operating.
Number of Channels:	2 (stereo)
Demodulation (D/A Conversion):	16-bit linear
Frequency Response:	5Hz-20kHz ± 0.5dB (at 44.1kHz)
Harmonic Distortion:	Less than 0.004% at 1kHz (at 44.1kHz)
Dynamic Range:	More than 95dB (at 44.1kHz)
Channel Separation:	More than 90dB
<b>ANALOG SECTION</b>	
Total Harmonic Distortion:	0.001% at rated output
Intermodulation (IM) Distortion: (60Hz: 7kHz = 4:1)	0.001% at rated output
Residual Noise:	network A less than 10µV
Frequency Response:	PHONO MM RIAA equalization curve 0.2dB TUNER, CD, VIDEO 1, 2, 3 3Hz-300kHz TAPE 1, 2, AUX + 0 ADAPTOR IN - 3dB
Input Sensitivity:	PHONO MC400 0.17mV, 1kΩ MM 2.5mV, 50kΩ TUNER, CD, VIDEO 1, 2, 3 150mV, 50kΩ TAPE 1, 2, AUX ADAPTOR IN
Maximum Input Capability:	PHONO MC 5mV MM 150mV
S/N:	PHONO MC (0.5mV) 83dB (A) MM (5mV) 95dB (A) TUNER, CD, VIDEO 1, 2, 3 105dB (A) TAPE 1, 2, AUX ADAPTOR IN
Output Voltage & Impedance:	REC OUT 1, 2, VIDEO OUT, DAT OUT, ADAPTOR OUT HEADPHONES 150mV, 16kΩ 45mV, (at 8Ω) Accepts low and high impedance headphones. PRE OUT 1.5V 47Ω Nominal
Tone Controls:	BASS, at 100Hz + 3.5dB (turnover - 4 freq. 200Hz) - 7dB (turnover - 6 freq. 400 Hz) TREBLE, at 10kHz + 7dB (turnover - 7.5 freq. 3kHz) + 3.5dB (turnover - 3.5 freq. 5kHz)
Subsonic Filter:	6dB/octave attenuation below 15Hz
<b>VIDEO</b>	
Input:	Video 1, 2, 3 Voltage 1V <sub>p-p</sub> Impedance 75Ω
Output:	Video 1, 2 Monitor TV Voltage 1V <sub>p-p</sub> Impedance 75Ω
S-Video IN:	Video 1, 2
S-Video OUT:	Video 1, 2 Monitor TV
<b>GENERAL</b>	
System:	Low-noise FET high gain NFB type equalizer amplifier, passive type direct tone control
Power Requirements:	AC 120V, 60Hz USA, CND
Power Consumption:	30W
AC Outlets:	1 switched, total 400 watts max., USA, CND, GENERAL AREA 1 unswitched, total 400 watts max.
Dimensions (WHD):	15½" x 5¼" x 14½"
Weight:	28 lbs. 11 oz.

**POWER AMPLIFIER: TA-N77ES**

Continuous RMS Power Output, both channels driven:	270W - 270W	4Ω 20Hz-20kHz T.H.D. 0.006%
	200W + 200W	8Ω 20Hz-20kHz T.H.D. 0.004%
Mono Operation:	580W	8Ω 20Hz-20kHz T.H.D. 0.007%
Dynamic Power:	800W 520W 300W	2Ω 4Ω 8Ω
Power Bandwidth:	10Hz-100kHz 10Hz-100kHz	4Ω 0.02% 8Ω 0.02%
Dynamic Headroom (DHF):	2.8dB 1.8dB	4Ω 8Ω
Total Harmonic Distortion:	0.004% 0.0018%	4Ω at 10W 8Ω at 10W
IM Distortion:	0.006% 0.004%	4Ω at rated output 8Ω at rated output
Damping Factor:	100	8Ω 1kHz
Slew Rate:	150V/µ sec 300V/µ sec (inside)	
Residual Noise:	less than 35µV	network A
Power Consumption:	330W USA	
Dimensions (WHD):	18½" x 7¾" x 17¾"	
Weight:	60 lbs. 11 oz.	

**SOUND PROCESSOR MODEL SDP-777**

System:	Digital Surround Processor
Sampling Frequency:	48.0 kHz
Format:	16 bit linear quantization (IEA)
Surround Mode:	Dolby Pro Logic Matrix/Hall/Simulated
Memory Presets:	3
Delay Time:	0.1-80.0 m/sec (0.1 m/sec steps, L/R channels independent)
Frequency Response:	Surround Out 5-20 kHz, ± 0.3 dB. Center Out 110 Hz-100 kHz, - 0.3 dB
Dynamic Range:	More than 90 dB (A network)
Harmonic Distortion:	Less than 0.008% (1 kHz, 3V, presence delay mode)
Input Level:	230 mV (Line In)
Input Impedance:	50 k ohms (Line In)
Output Level:	Front Out 230 mV Surround Out 230 mV Center Out 230 mV (Low)
Video Inputs:	4
Video Input Level:	1 V <sub>p-p</sub> @ 75 Ω
Video Output Level:	1 V <sub>p-p</sub> @ 75 Ω
S-Type Video Input:	2
S-Type Video Output:	1
Power Requirement:	120 V 60 Hz
Power Consumption:	30 watts
Dimensions (WHD):	17 x 3½ x 13½ in.
Weight:	13 lbs. (6.1 kg)
Remote Control:	70z RM 577

**GRAPHIC EQUALIZER MODEL SEQ-333ES**

Frequency Response Line:	10 Hz-100 kHz + 0 - 1 dB
Total Harmonic Distortion Line:	Less than 0.0015% (1 V output, 1kHz, flat)
Signal-to-Noise Ratio Line:	More than 116 dB (A network, 2 V output, flat)
Center Frequencies:	31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz
Adjustable Range:	L, R or L + R ± 12 dB (2 dB step)
Gain:	0 dB
Automatic Acoustic Equalizer:	Yes
Measuring Level:	About 74 dB = 10 dB SPL (at microphone position) (at ± 10dB by SENSE control)
Measuring Time:	About 2 seconds for each channel after level reaches the measurable level.
Number of measurements:	Max 8 times (averaged)
Fixed memories:	A for rhythm music, B for female vocal, C Loudness, D Flat
Inputs (0 dBs = 0.775 V): Reference input level:	Line in: - 10 dBs (245 mV) Tape 1, 2: - 10 dBs (245 mV)
Input Impedance:	MIC: Low Impedance Line in: 50 k ohms Tape 1, 2: 50 k ohms
Connector:	MIC: Mini jack
Line Out Rec Out 1, 2: Reference out level:	- 10 dBs (245 mV)
Max. output level:	- 20 dBs (7.75V)
Output Impedance:	1 k ohm
Power Requirements:	120 V 60 Hz
Power Consumption:	14 Watts
AC Outlet:	1 unswitched, 600 watts max.
Dimensions (WHD):	17 x 4¼ x 10½ in.
Weight:	10 lb. 13 oz.

**DIGITAL CONVERTER MODEL DAS-703ES**

System:	Digital-to-Analog (D/A) Converter
Format:	Sampling Rates: 32 kHz 44.056 kHz, 44.1 kHz, 48 kHz
Channels:	Two Channels
Demodulation:	16 Bit Linear
Frequency Response:	5-20 kHz, ± 0.5 dB (44.1 kHz sampling rate)
Harmonic Distortion:	Less than 0.004% (1 kHz; 44.1 kHz sampling rate)
Dynamic Range:	More than 95 dB (44.1 kHz sampling rate)
Stereo Separation:	More than 90 dB (1 kHz)
Line Output:	Fixed 2.5v/10k ohm Variable 0-2.5v/10k ohm
Headphone Output:	0-14 mW at 32 ohms
Digital Input:	0.5 V <sub>p-p</sub> ± 20% impedance 75 ohms
Digital Output:	0.5 V <sub>p-p</sub> ± 20% impedance 75 ohms
Power Requirements:	120 V, 60 Hz
Power Consumption:	25 W
Dimensions (WHD):	17 x 4½ x 16½ in.
Weight:	33 lbs.
Supplied Accessories:	Audio connecting cables (2) Digital connecting cable (1)

**SPEAKERS MODEL**

	APM-22ES	APM-66ES
Drivers:		
Woofer:	45 square in APM	66 square in APM
Mid-Range:	-	7.4 square in APM
Tweeter:	1.4 square in APM	1.4 square in APM
Crossover Frequency:	2.0 kHz	600 Hz, 4.5 kHz
Enclosure Type:	Bass Reflex	Bass Reflex
Frequency Response:	40 Hz-20 kHz	30 Hz-30 kHz
Sensitivity:	88 dB SPL, 1 Watt, at 1 meter	89 dB SPL, 1 watt at 1 meter
Power Handling Capacity:	80 watts nominal, 160 watts maximum	100 watts nominal, 200 watts maximum
Nominal Impedance:	6 ohms	6 ohms
Dimensions (WHD):	11½ x 20½ x 12½ in.	15 x 26 x 14½ in.
Weight:	30 lbs., 15 oz.	5 lbs., 6 oz.
Supplied Accessories:	2.5M speaker cord	2.5M speaker cord
Optional Accessories:	WS-220 speaker stand	WS-660 speaker stand

Features and specifications subject to change without notice.  
Non metric weights and measurements are approximate.

*The music has ended. The last note disappears into the silence from whence you began. And as you power down your ES Series system with a touch on your remote control, you realize that you've just experienced a private performance of the world's finest music.*

*It is a satisfaction you'll experience again and again because this is precisely what the Sony ES Series engineers have so dedicatedly striven to achieve. Their creations are indeed masterpieces. Masterpieces of technological ingenuity. Masterpieces of design. Masterpieces of the sound reproduction art.*

*And for music lovers of discerning taste, Sony ES Series components, like all works of art, provide joyful, elevating experiences of timeless beauty and inestimable value.*

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**SONY**

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