YAMAHA

Z11

RX-Z11: 11.2-Channel Digital Home Theater Receiver

RX-Z11

11.2-Channel Digital Home Theater Receiver

High Definition (HD) is one of the most common phrases in the home electronics market today. Relating to both audio and video, true high definition offers consumers an experience akin to that of cinema.

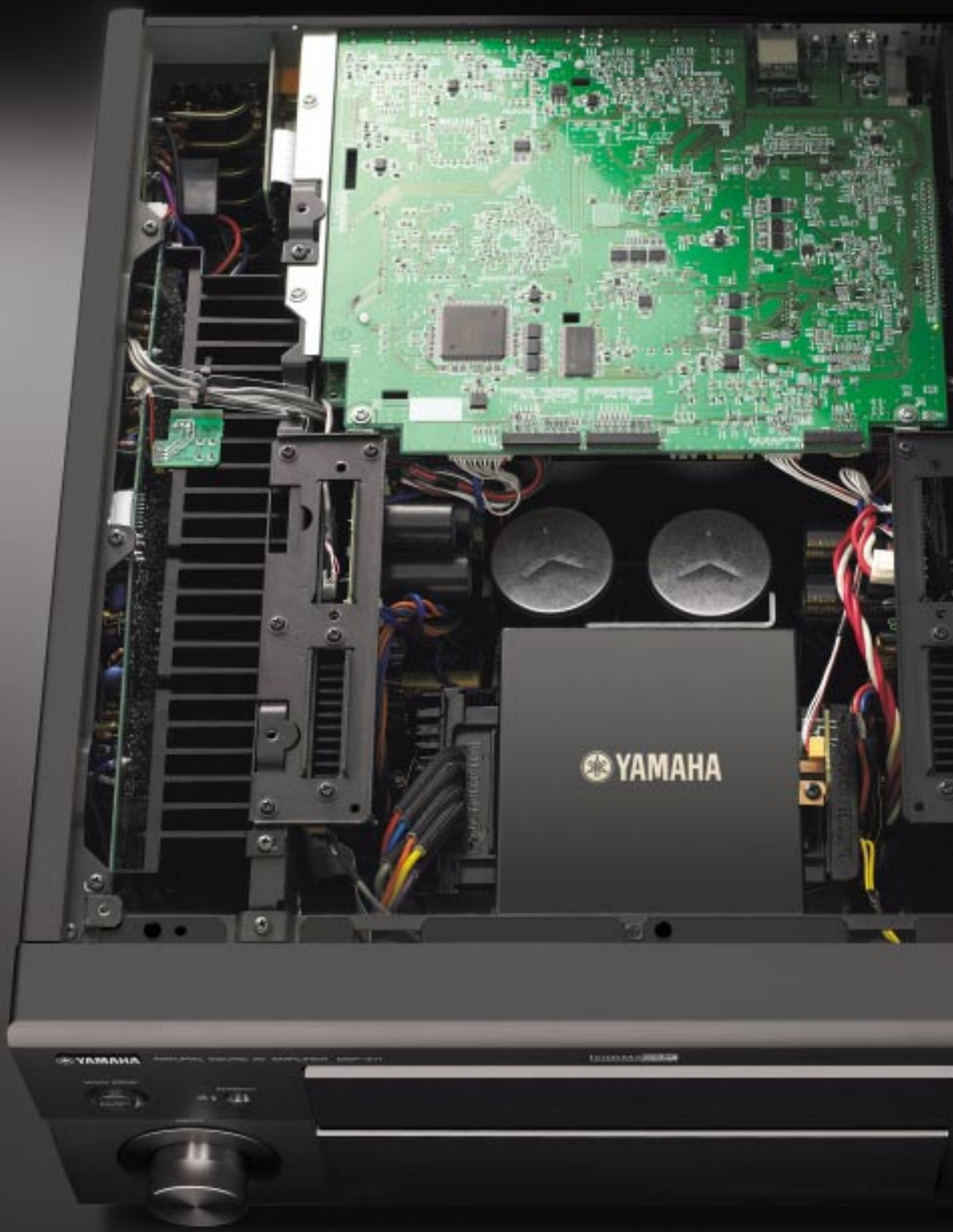
The Yamaha RX-Z11 is a completely new standard of Home Theater Receiver that will allow you to realize all the possibilities of the HD era; not only today, but for years to come.

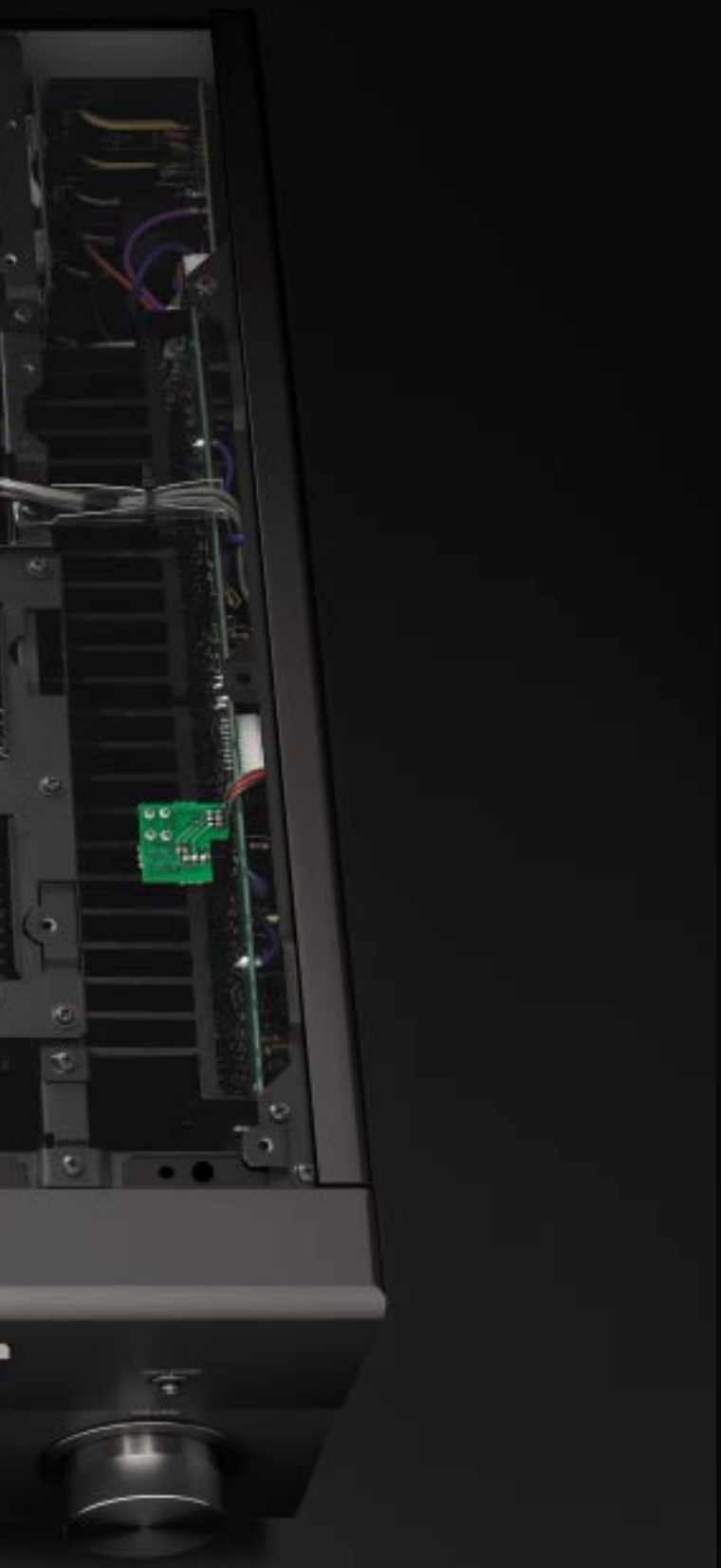
For the HD Audio Era

A receiver designed for the High Definition entertainment era.

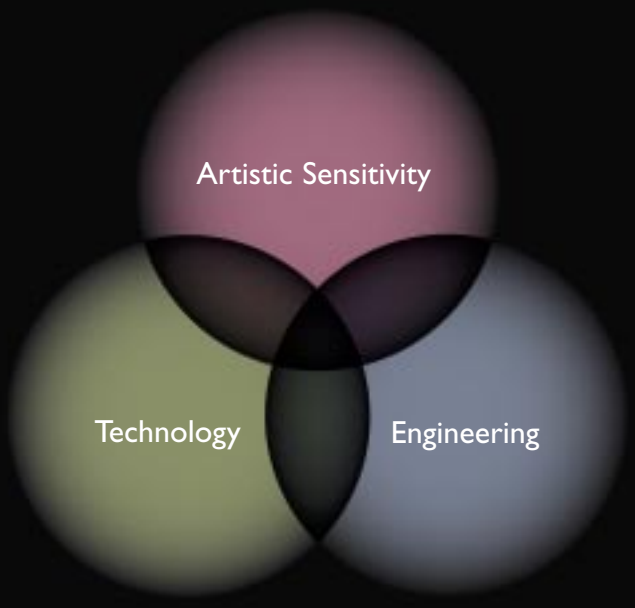
The RX-Z11 embodies the latest in HD audio and video coupled with the ability to get the maximum performance from any kind of source. Regardless of the format you are using, or the number of channels selected to enjoy movies, music or TV, the RX-Z11 provides extraordinary convenience and versatility in selecting and controlling the sound.

The Yamaha RX-Z11 — the best receiver for the future. The best receiver for right now.


YAMAHA



Three Areas of Expertise Result in Sound Performance Far Beyond the Ordinary.

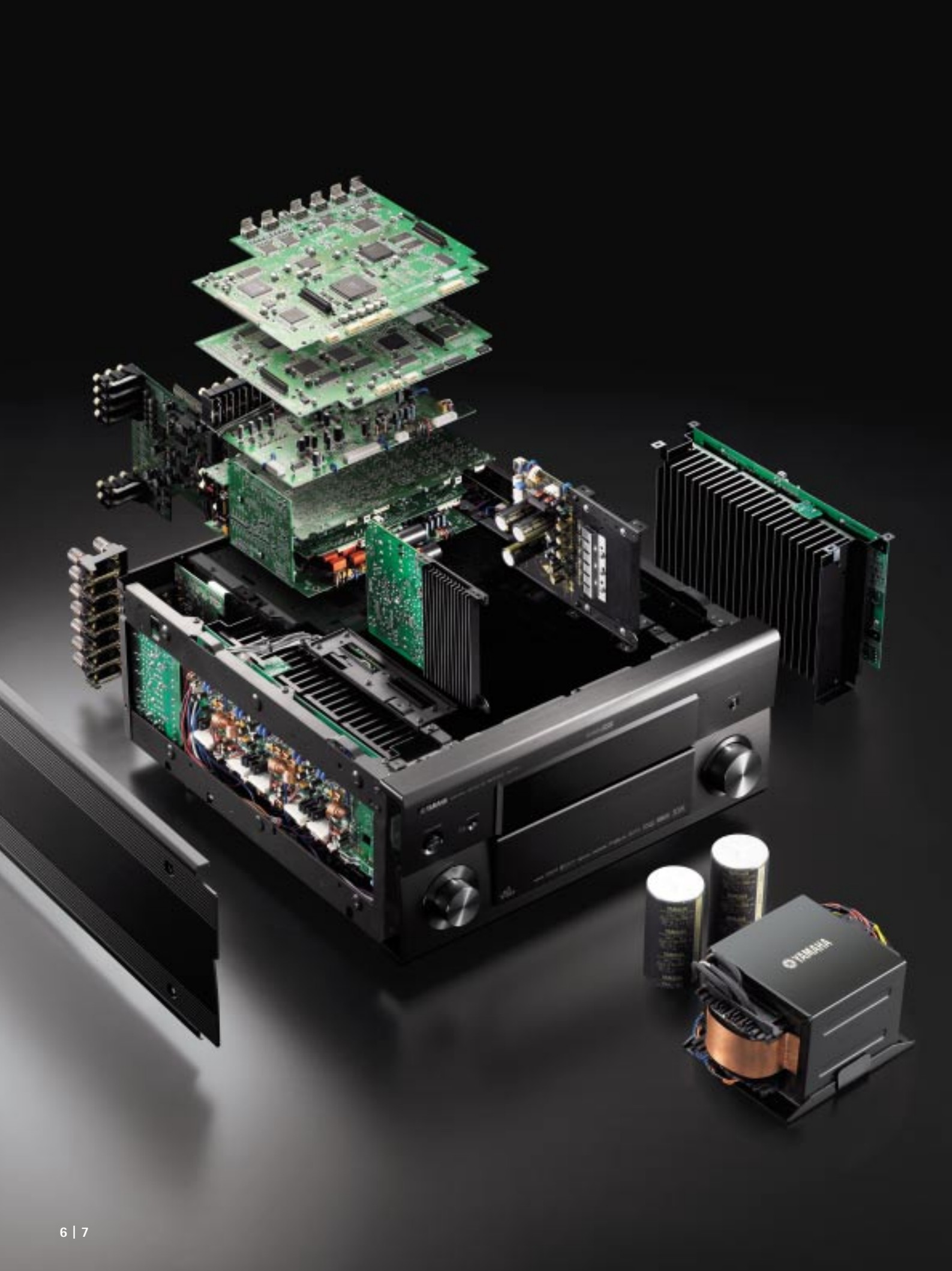


Technology, engineering and above all, artistic sensitivity.

These are the three areas of expertise that enable Yamaha to create superior products like the RX-Z11.

Our vast range of technologies, both analog and digital, are constantly being refined and expanded, allowing us to remain on the cutting edge of sound reproduction performance. Engineering refers not only to the building and assembling of products but also to the upgrading of functions and specifications, important factors in determining overall quality. The final aspect is artistic sensitivity, which is the focal point of our corporate culture, as we have been involved in the creation and reproduction of music for over a century. It is how we go beyond the physical specifications to create, tune and refine the sound based on the musical acuteness of our most experienced audio technicians.

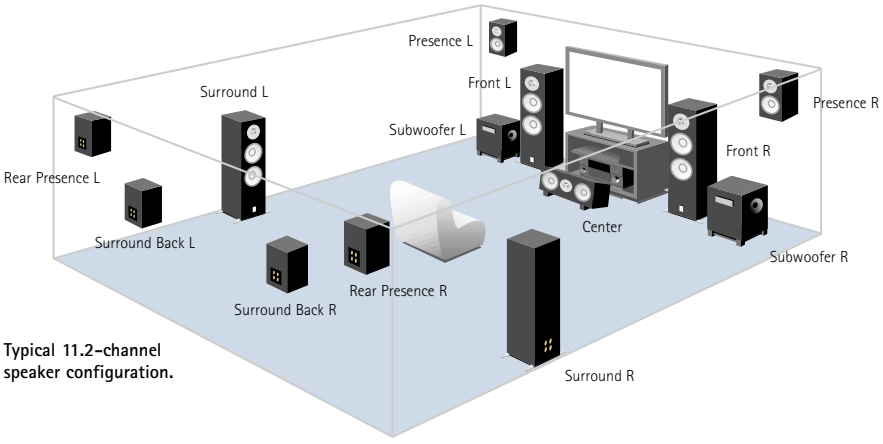
The result in the case of the RX-Z11 is an unprecedented level of audio performance. Sound that is not only clear and high resolution, but finely textured. Sound with the ability to realistically convey, for example, the sound of light rain, rustling cloth or breaking glass. Sound with ideal imaging in every area of the immense three-dimensional surround sound field. And finally, sound with an optimum balance among the three key elements of resonance, deep bass and responsiveness, for best compatibility with all types of sources.



The Foundation of Superb Sound Quality: Ultra-Clean, Stable Power

11.2 Channels of Power at Your Command

The RX-Z11 can output 140W to each of the seven front, center and rear channels plus 50W to each of the four presence and rear presence channels. It also allows the simultaneous use of two subwoofers (hence 11.2 channels). This is more than enough power to ensure that Yamaha's CINEMA DSP HD³ (HD Cubic) technology will deliver high density, incredibly detailed surround sound. What's more, you can use the extensive zone customization functions to allocate the 11 channels in various ways for enjoying sound in up to four different rooms.



Typical 11.2-channel speaker configuration.

Best Design, Best Parts: Digital ToP-ART

Our aim is to give you the highest possible sound purity; our methods are based on a design concept we call Digital ToP-ART (Total Purity of Audio Reproduction Technology). This not only holds distortion to practically zero, it ensures that massive amounts of digital sound data can be transmitted at speeds of up to 192kHz. The interior layout thoroughly isolates the digital, analog and video sections and provides the shortest possible signal routes. Innovative circuit designs and ultra-strict parts evaluation were vital to achieving the quality demanded by the latest lossless compression formats received via HDMI bitstream transmission. The RX-Z11 uses an extra large power transformer, a high performance op amp, custom-made 27,000µF block capacitors, Schottky barrier diodes and a Variable Volume Control that helps improve the S/N ratio.

Not Just High Power — High Current, Too

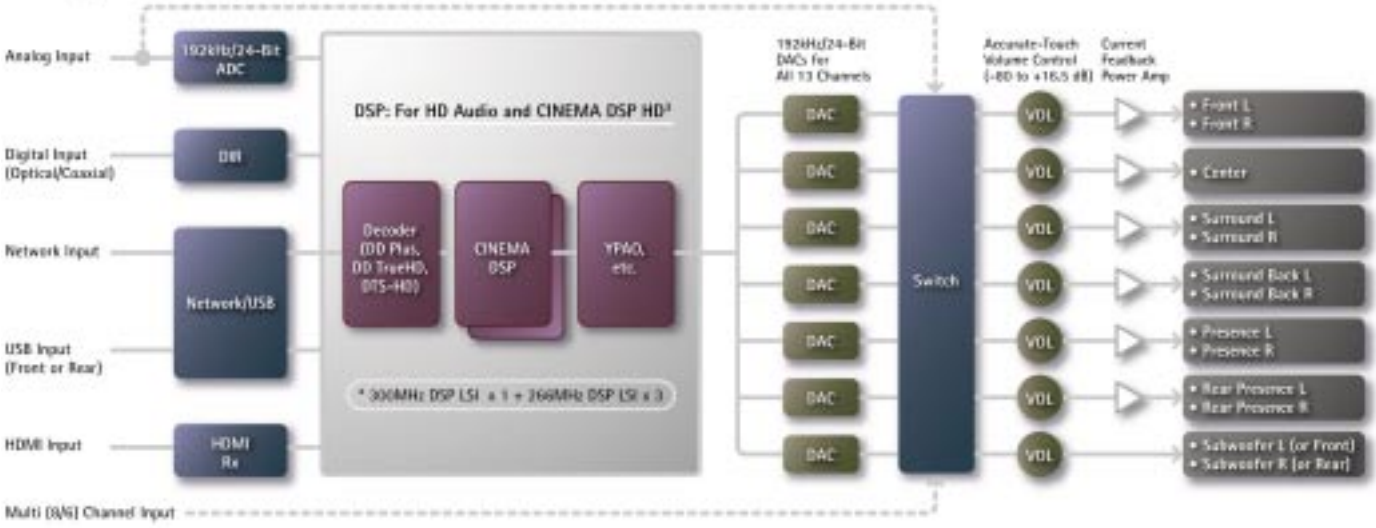
Although power rating is generally the first thing people look at, high power output does not necessarily mean good sound. In fact, high current level is a more important factor. Recognizing this, Yamaha developed Yamaha High Current Amplification technology, which delivers low impedance, high current power from input (power supply circuit) to output (speaker terminals). This drives the speakers much more smoothly and dynamically, for better sound from all sources, even two-channel audio.

In the RX-Z11, high current amplification was achieved by overcoming the difference in voltage that ordinary receivers suffer between the power supply and amplifier circuits, caused by current fluctuations. This was solved by using custom-made, high-grade block electrolytic capacitors and a copper grip for one-point grounding. Another current drop is generally seen between the amplifier circuit and the speaker terminals, caused mainly by the cables, speaker output relays and copper circuit boards. To increase current here, we used an extra-large, low-impedance transformer and gold-plated speaker relay contacts.

Accurate Touch Volume Control

The Accurate Touch Volume Control lets you make adjustments within a narrow range. Its extreme accuracy, with negative gang error of less than 0.5dB, is due to a high signal resolution analog design in conjunction with an ultra-precise digital control circuit.

RX-Z11 Digital ToP-ART Configuration (11.2-Channel Main Zone)



Preamplifier Stage: A Total Commitment to Quality

The Quest for "Natural Sound"

Yamaha's goal is to bring you the pure emotion that the creator wanted to convey as perfectly as possible, regardless of the sound format or genre. Not only for music heard from two-channel sources, but for all the sources, including the latest ones such as Blu-ray Disc, that let you enjoy video and sound together. The clarity of these sources, however, means that you can become aware of the receiver and speakers' sound, that is, how they "color" the sound. Yamaha's mission, which we have achieved in the RX-Z11, is to go beyond "high quality sound" (good S/N ratio and so on) to provide sound so natural that you are not even aware of the existence of the speakers.

New Pure Direct

New Pure Direct causes the audio signal to bypass all non-essential circuitry so it travels the straightest, shortest path to deliver the highest purity. In the RX-Z11, we have further refined it to provide the best possible sound from lossless audio formats digitally transmitted via HDMI, while still ensuring optimum quality from CD and analog audio sources. With the RX-Z11 in New Pure Direct mode, you will experience the full potential of the magnificent Blu-ray Disc sound.

In addition, New Pure Direct now includes a Video On mode. Previous versions of Pure Direct did not allow its use with video sources due to the risk of noise being introduced from the video circuitry. Improvements in New Pure Direct enabled us to include a Video On mode, so you can get the full benefits while watching movies and other video sources.

Pure Ground DAC Concept

The DACs are located on the analog circuit board, preventing the large ground potential differences that can occur when the digital and analog sections are far apart. Furthermore, they are connected directly to the power supply to avoid degradation of low level signals.

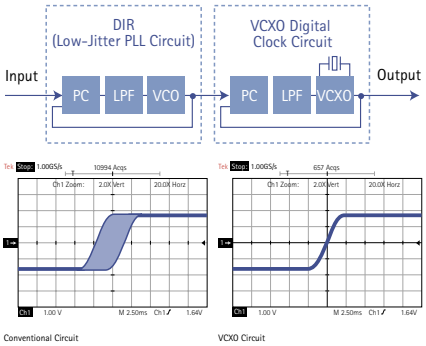
High Quality Preamplifier Block Design

The printed circuit boards are located very close to each other. This has the advantages of minimising signal paths, shortening signal loops and improving noise isolation from other circuits.

Low-Jitter PLL and Digital Clock Circuits

The preamplifier stage incorporates both a low-jitter PLL circuit and a VCXO digital clock circuit, significantly reducing jitter from digital inputs so sound processing can be accomplished without being affected by jitter. This is particularly effective in improving the sound quality of digital signals that are input via HDMI.

Low-Jitter PLL and VCXO Digital Clock Circuits

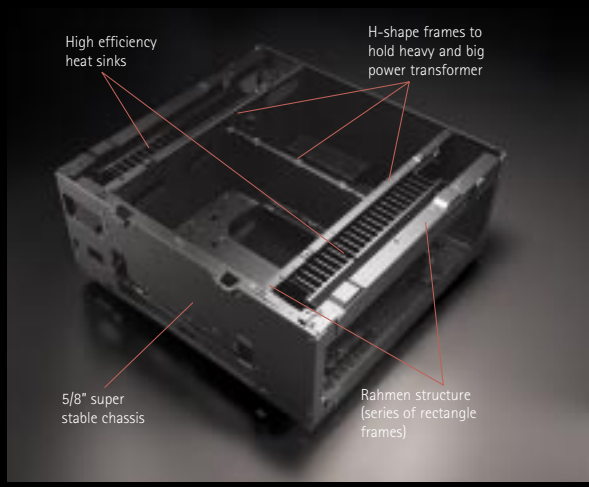


Conventional circuit shows a wide range of jitter while the RX-Z11 preamplifier exhibits virtually no jitter.

Rigid Chassis with Internal H-Shape Frames

In order to support all the large components and prevent any vibration from occuring, the chassis was designed with an extra strong and rigid structure. The internal layout is symmetrical, with the large, heavy power transformer in the center braced by three frames in an H shape, and the large heat sinks on the left and right held in place by a Rahmen structure (series of rectangular frames). The H frames, under-chassis and outer walls are all made of thick 5/8" plates.

1 Custom-made 27,000µF block capacitors
2 Extra-large power transformer
3 High efficiency heat sink
4 Large-size speaker terminals
5 Selected high sound quality parts
6 Volume IC JRC NJM1194 (left), Burr Brown audio DAC (DSD1796, center) and Op amp LM4562 (right)
7 Schottky barrier diodes



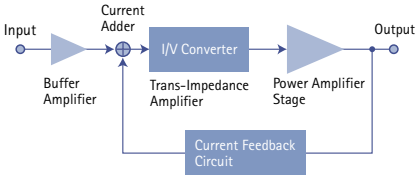
Super Stable Chassis with ultra-rigid Rahmen structure and H-shaped frames

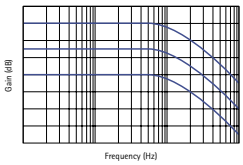
Power Amplifier Stage: Precision-Designed to Maximize Power Performance

Current Feedback Circuit for All Channels

The power amplifier uses current rather than voltage for feedback in all channels. Because there is virtually no phase shift, phase compensation can be kept to a minimum. This contributes to the RX-Z11's excellent transient response, maintains the flat frequency response even when gain increases, and creates a warmer, texture-rich sound.

Current Feedback Principle and Frequency Response





Frequency response curves for different gain settings of the current amplifier shows characteristics remain uniform over a wide range.

Hybrid Low Noise Power Supply

A highly efficient DC-DC converter and extra-large transformer are used for the digital circuit, which requires high current input, and a low noise power supply circuit for the analog audio circuit. An independent current power path is provided for the speaker relays and display. The power supply design also avoids having a common impedance for the digital, video and audio circuits.

Layout of Parts and Circuits Optimizes Performance

The internal layout is symmetrical, with the heavy power transformer in the center and the heat sinks on either side. The power circuit layout separates the video and digital audio section from the analog audio section to eliminate adverse influences, and the distances between the circuits and power supplies are very short to avoid high current loop problems. In addition to the large heat sinks, two powerful 3-5/8" fans ensure efficient heat dissipation.

Large, stable feet and twin-fan (3-5/8") cooling system

Assignable Amplifiers for Bi-Amp Connection

Bi-amping assigns the amps used for the surround back channels to work in conjunction with the front speaker amps, providing separate high and low frequency outputs to the front speakers. This delivers more power to the front speakers for multi-channel or HiFi sound. Both high frequency and low frequency sound quality is improved.

High Dynamic Power Capability

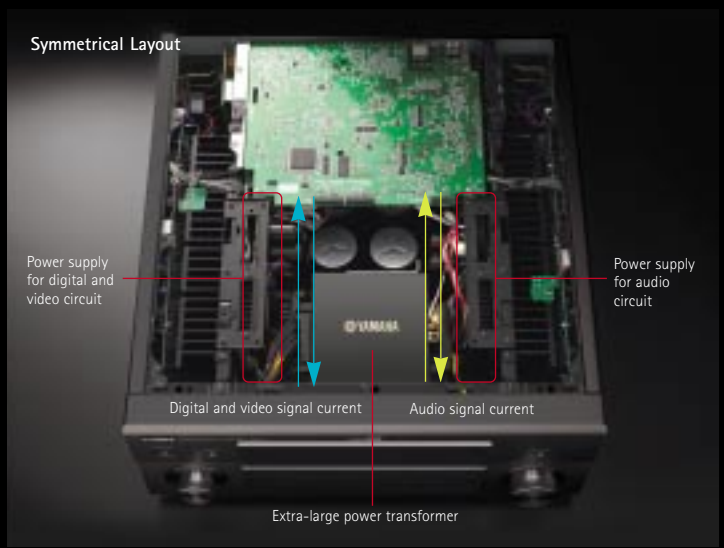
The RX-Z11 is capable of delivering large amounts of reserve power for accurate reproduction of the high energy peaks that are especially prevalent in digital audio sources. This prevents clipping and emphasizes the music's dynamic qualities.

Thorough Vibration Damping

Thick aluminum panels are used to separate the various sections of the receiver. They add to the effect of the heavy chassis and large, heavy feet to fully dampen external vibrations.

Preamplifier circuit board (top) and printed circuit board (bottom).

Digital power circuit board (top) and analog power board (bottom).



Nothing Matches the Magnificence of Yamaha's Three-Dimensional Sound Field — Except the Original Sound Itself.

For more than two decades, Yamaha has been in the forefront of home theater sound reproduction. Beginning with HiFi DSP and progressing to CINEMA DSP, which has evolved through Tri-Field, Quad-Field and now HD³ (HD Cubic), Yamaha has taken the concept of surround sound and advanced it to a form of virtual reality that brings the sound of musical performances and movies into the home with a sense of realism unmatched by any other system.

Whether relaxing with a favorite music disc or immersing yourself in the magic world of cinematic adventure, fantasy or romance, Yamaha allows you to experience the pure enjoyment that the original creators hoped to convey.

CINEMA DSP HD³ DIGITAL

Yamaha DSP Technology: Achieving the Accurate Reproduction of Not Just Sounds, but Sound Fields

The Foundation of Yamaha DSP Technology Is the "Natural Sound" Concept

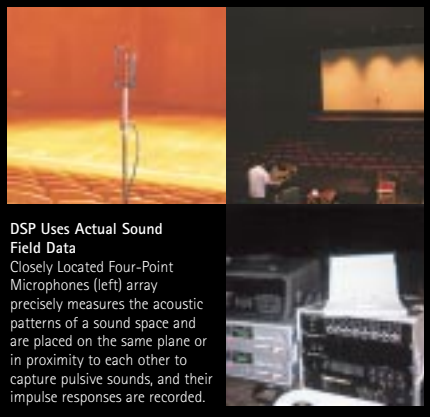
In order to provide truly enjoyable performances, musical instruments and voices require spaces where they can be played and sung with good acoustics. When Yamaha engineers first decided to develop surround sound technology, their thinking was: "Even if it is not live music, but is reproduced from a CD or record, music should be heard in an environment well suited to it, and if this is impossible, isn't it impossible to call it 'natural sound'?" Although they were able to provide extremely high quality two-dimensional music reproduction quality based on two-channel stereo, they dreamed of recreating accurate spatial imaging having a three-dimensional quality. Digital Sound Field Processing was thus technology created from a pure audio concept in order to more faithfully and accurately reproduce music.

The Sound Field of a Concert Hall Affects How the Music Sounds

The sound you hear in a concert hall contains not only the sound that comes directly from the musical instruments but also early reflections – the sound that reaches you after reflecting off the walls and ceiling – and late reverberations – the sound that bounces off the ceiling and walls many times before it reaches you, gradually decreasing in level. Components of these reflections are different from hall to hall, according to size, building materials and other factors. That's why each hall has a unique sound field.

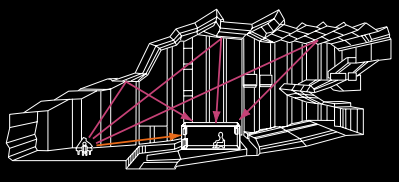
Yamaha Uses Actual Sound Field Data

It is important to note that in referring to Yamaha technology, DSP does not mean Digital Signal Processing, as it does to other manufacturers, but Digital Sound Field Processing. CINEMA DSP is based on a technology developed by Yamaha in 1986 to precisely "map" the sound fields, or acoustic characteristics, of famous concert halls, jazz clubs, churches and other spaces.



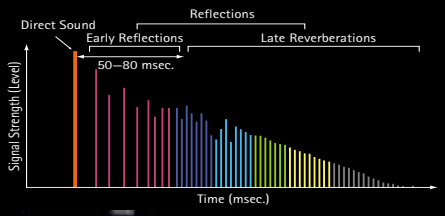
DSP Uses Actual Sound Field Data
Closely Located Four-Point Microphones (left) array precisely measures the acoustic patterns of a sound space and are placed on the same plane or in proximity to each other to capture pulsive sounds, and their impulse responses are recorded.

How Sound Propagates



■ Direct Sound ■ Early Reflections

Early Reflection and Reverberation Processing
DSP consists of early reflection processing and reverberation processing. The Sound field of a concert hall or jazz club, for instance, is recreated by early reflection processing alone; reflections essentially determine the character of the space.



Virtual Sound Source Distoribution of Programed Ambience Data
Virtual sound sources (late reverberations) are blue to white rounds. Round scale is a reflection strength.

Center: Listening Position
Direct Sound
Early Reflections
Late Reverberations

Extensive data was gathered using a system called the Closely Located Four Point Microphone Method, which accurately captures both original sounds and reflections. Each reflection is then resolved by a correlating process which determines the location and strength of its virtual sound source. This is the hypothetical source of a reflected sound, and is represented in terms of the direction from which the reflection comes, the time it takes to reach the listener, and its strength. A distribution map – a pattern of virtual sound sources and echoes – is then generated by projecting three-dimensional spatial information on a two-dimensional plane, making it possible to express the sound field as a graphical pattern of direct sounds and reflections.

Synthesizing Sound Fields Based on Actual Data

This data is stored on and processed by extremely powerful and sophisticated computer chips developed by Yamaha, enabling the precise reproduction of all of the direct and reflected sounds, including their direction, as well as reverberations. The sound field can be represented by imaginary sound source distributions such as the one shown in the diagram. The center of the diagram represents the point where the data was gathered, with the top being the stage direction. The concentric circles represent the delayed reflected sound as the actual distance traveled, with 1 meter equivalent to about 3/1,000 second.

Each of the small circles represents a "source" of reflected sound that reaches the ears of the listeners. The size of the circle represents strength, while the direction from the center point represents the direction the final reflected sound travels from. The greater the delay in the reflected sound, the further it is located from the center point.

HiFi DSP Programs: Like Having a Perfect Seat at a Famous Venue

Based on data recorded in famous entertainment venues around the world, these programs reproduce the original sound field of the performance spaces in your room. You have a choice of various sound fields, such as Hall in Vienna that reproduces the rich reverberations of the classic shoebox shaped concert hall, Village Gate that conveys the energy of the famous New York jazz club, and The Roxy Theatre that brings you the exciting atmosphere of the LA rock venue.

CINEMA DSP HD³ (HD Cubic): Creating Sound Fields that Seem Larger than Your Room

Movie Sound Design

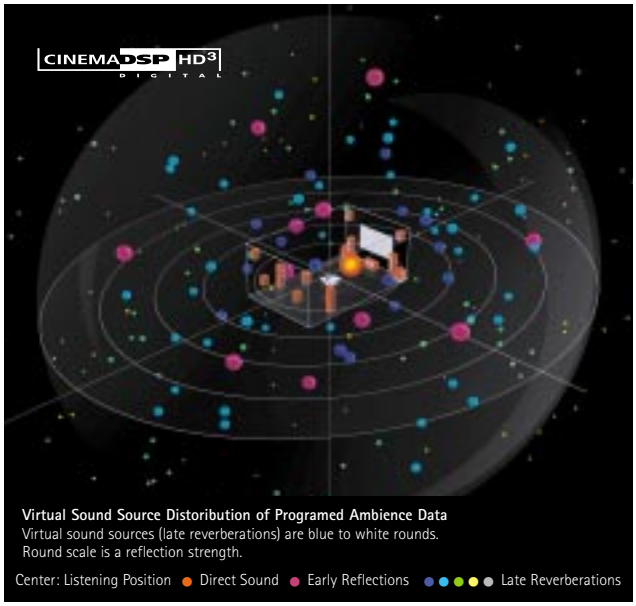
Movie sound is designed to be integrated so that the voices are clearly fixed on the screen, sound effects are behind them, the music spreads out behind that, and the surround sound envelopes the audience. The sound is "designed" in a dubbing theater that has sound mixing and movie screening equipment. The film sound track is encoded in the surround formats described above, and is recorded on discs for home use.

Movie Theater Sound Versus Home Theater Sound

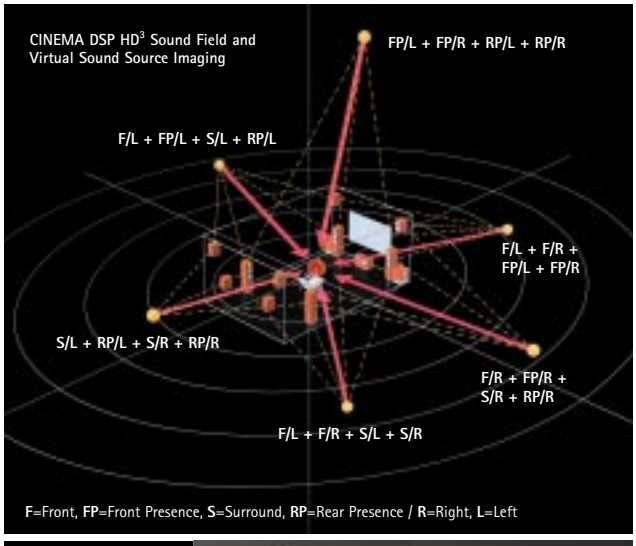
A major difference between movie theater sound and home theater sound is in the number and positioning of the speakers. In a movie theater, the sound is designed so that it can be reproduced as desired using multiple surround speakers embedded in the left, right and rear walls and positioned so that they emphasize the relationship between sound from the screen and channels. This provides a more uniform quantity of sound to the wide audience area.

Another difference is in the volume of space between a large theater and a family listening room, which is why the sound from a theater cannot be simply reproduced, with no modification, in a home theater.

The ability to overcome these differences is what made the original CINEMA DSP technology so successful; but it has undergone several phases of evolution since then.



Virtual Sound Source Distoribution of Programed Ambience Data
Virtual sound sources (late reverberations) are blue to white rounds.
Round scale is a reflection strength.
Center: Listening Position ● Direct Sound ● Early Reflections ●●●●● Late Reverberations



F=Front, **FP**=Front Presence, **S**=Surround, **RP**=Rear Presence / **R**=Right, **L**=Left

The Evolution of CINEMA DSP

The first major advance was Tri-Field CINEMA DSP, which produced three sound fields. The presence sound field was in the front, and two surround sound fields created a large-scale soundscape spreading out to the left and right, thus giving the listener a three-dimensional feeling of depth. This was followed by Quad-Field CINEMA DSP, which added a fourth sound field in the rear, through the use of 7.1-channel sound formats.

The RX-Z11 introduces Yamaha's latest digital sound field processing refinement: CINEMA DSP HD³ (HD Cubic). As amazing as the previous technology was, this marks a further evolution of CINEMA DSP. Four of Yamaha's most advanced DSP engines provide tremendous processing power, permitting the lossless decoding of 192kHz signals, and adding a new 3D processing technique that gives the sound field an extra vertical dimension. In its full 11-channel configuration setting it utilizes the two presence and two rear presence speakers, offering the enjoyment of an even richer, more spacious and detailed sound environment.

CINEMA DSP Programs for Amazingly Realistic Sound from Movies and Other Entertainment Choices

The RX-Z11 offers six Movie program choices, including Spectacle for movies with strong visual and audio impact, Sci-Fi for SFX movies, Adventure to emphasize the sound of action movies, and Drama for a wide range of movie genres from serious dramas to musicals and comedies. Seven Entertainment programs match the audio characteristics of sources such as sports, music videos, action games and roleplaying games. It also provides seven THX programs and naturally, is compatible with all the available Dolby and DTS sound formats, so you hear the full potential of every movie and music source.

DOLBY TRUEHD

dts-HD Master Audio

Why so many programs?

You may wonder if 20 music programs, 13 movie programs and seven THX programs are really necessary. Will you use them? Can you hear the differences? Our answer is that you should use them, you will enjoy experimenting with them (who knows?...certain rock albums may sound great in a church), and that yes, you can hear the differences. You may not hear a difference in every note or line of dialogue, but during key scenes of a big-budget extravaganza, for example, you will enjoy a broader, larger scale sound with the Spectacle program than with any other. So if you really enjoy music and movies, and want to enjoy them even more, you will definitely appreciate the wide range of HiFi and CINEMA DSP programs that the RX-Z11 puts at your instantaneous command.

RX-Z11: 40 Surround Programs (33 DSP Programs)

CINEMA DSP HD3 DIGITAL

Compatible Decoding Formats		
	Dolby Digital	For precise reproduction of the various movie sound formats.
	Dolby Digital EX	
	Dolby Digital Plus	
	Dolby Digital TrueHD	
	DTS Digital Surround	
	DTS-ES Matrix 6.1	
	DTS-ES Discrete 6.1	
	DTS 96/24	
	DTS-HD High Resolution Audio	
	DTS-HD Master Audio	
	Dolby Pro Logic	
	Dolby Pro Logic II Music	
	Dolby Pro Logic II Movie	
	Dolby Pro Logic II Game	
	Dolby Pro Logic IIx Music	
	Dolby Pro Logic IIx Movie	
	Dolby Pro Logic IIx Game	
	DTS Neo:6 Music	
	DTS Neo:6 Cinema	
	Neural-THX	
	Circle Surround II Music	
	Circle Surround II Cinema	

HiFi DSP Programs		
CLASSICAL1	Hall in Munich A	A wide and deep hall. A 2,500 seat concert hall with its interior finished in the chic wooden paneling often seen in Europe.
	Hall in Munich B	A large fan-shaped hall with a wooden interior seating 2,500 in Munich.
	Hall in Frankfurt	A shoebox-shaped hall seating 2,400 in Frankfurt.
	Hall in Stuttgart	A classical shoebox-shaped hall seating 1,700 in Stuttgart.
	Hall in Vienna	A classical mid-size hall with abundant reverberations. A traditional shoebox type mid-size concert hall with 1,700 seats.
	Hall in Amsterdam	A shoebox type large hall with a circular stage and stage-back seating, having 2,200 seats.
CLASSICAL2	Hall in USA A	A shoebox-shaped hall seating 2,600.
	Hall in USA B	A classical large size hall with abundant reverberations.
	Chamber	A wide and deep hall. A relatively wide space with a high ceiling like the grand hall of a palace.
	Church in Tokyo	An ordinary church wit moderate reverberations.
	Church in Freiburg	A church with extremely long reverberation time. This is a large church with a tower almost 120m high.
	Church in Royaumont	A medieval Gothic monastery located near Paris. A relatively wide space with a high ceiling like the grand hall of a palace.
LIVE/CLUB	Village Gate	The famous New York jazz club has a wide listening area.
	Village Vanguard	A traditional jazz club with low ceiling and corner stage. in New York City.
	The Bottom Line	A famous cabaret in New York City. No longer open, but well remembered, the Bottom Line had seating for 300.
	Cellar Club	A live music club with a low ceiling.
	The Roxy Theatre	The well known rock showcase seating 460. in Los Angeles
	Warehouse Loft	A concrete store room. A concrete space reminiscent of a loft in Soho.
	Arena	The sound field of a large arena.
STEREO	11 Channel Stereo	Downmixes multi-channel sources to 11 channels.
HiFi DSP Subtotal	20	

CINEMA DSP Programs		
ENTERTAINMENT	Sports	A wide range of applicability to variety shows and sports broadcasts.
	Music Video	Offers the image of a pop, rock, or jazz live concert venue. Emphasizes the vividness of vocals or solo instruments.
	Recital/Opera	Presents the presence of a stage, and the beauty of music.
	Pavilion	Reproduces vocals clearly and feels pavilion spaciousness.
	Disco	Designed to emphasize the exciting rhythms of disco music.
	Action Game	For action games with violent sound movements.
	Roleplaying Game	For games that provide performances that emphasize a story.
MOVIE	Standard	Priority is placed on surround effects that make you feel as if you are surrounded from behind.
	Spectacle	Emphasizes the excitement of scenes with high visual/audio impact.
	Sci-Fi	A sound field with the transparency that vividly distinguishes the delicate sound designs of the latest SFX movies.
	Adventure	A powerful three-dimensional sound field with superb clarity. Optimized for action and adventure movies
	Drama	Lets you quietly enjoy a movie with priority on the clear dialogue with a soft, expansive sound.
	Mono Movie	Lets you enjoy old monaural movies in the atmosphere of movie theaters back in the day.
CINEMA DSP Subtotal	13	

THX Programs		
THX	Surround EX	THX processing for sources decoded by the Dolby Digital EX decoder.
	Ultra2 Cinema	THX processing for multi-channel movie sources.
	Cinema	THX processing for two-channel or multi-channel movie sources.
	Ultra2 Music	THX processing for multi-channel music sources.
	Music	THX processing for two-channel or multi-channel music sources.
	Ultra2 Games	THX processing for multi-channel game sources.
	Games	THX processing for two-channel or multi-channel game sources.
THX Subtotal	7	

Program Total	40


Standard


Spectacle


Sci-Fi

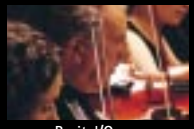

Adventure


Drama


Mono Movie


Sports


Music Video


Recital/Opera


Disco


Action Game


YAMAHA
MODEL NO. RX-Z11
120 VOLTS 600 WATTS
1000 VA 60 Hz
YAMAHA CORPORATION
CAUTION
WARNING
AC IN
DIGITAL IN
SPEAKER IMPEDANCE
CLASS 2 WIRING
FRONT A
FRONT B
SURROUND
REAR PRESENCE / ZONE
FRONT PRESENCE / ZONE
PRE OUT

HD and HDMI:
Superb Sound Quality and Maximum Video Performance

Discover the Pleasure of HD Audio

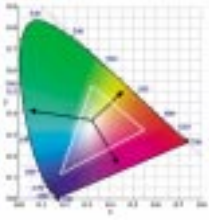
The RX-Z11 enables you to enjoy the extraordinarily rich and detailed surround sound offered by Blu-ray Disc players. It can transmit 5.1 channels of 192kHz/24-bit signals, the highest present specification, via HDMI. This ensures that you can fully enjoy sources that use the Dolby TrueHD and DTS-HD Master Audio formats, which provide surround sound expressiveness never before possible, such as delicate wind sounds.

HDMI 1.3a Compatibility

The RX-Z11 is compatible with the newest version of the HDMI 1.3a standard, allowing the transmission of digital video and audio signals via a single cable and providing the benefits of Deep Color (30/36bit) and the x.v.Color standard. It has five HDMI inputs, and is the first AV receiver to provide one of them on the front panel. There are also two HDMI outputs that allow images to be displayed on two devices, such as a flat panel monitor and a projector. HDMI 1.3a means the RX-Z11 can handle the high 1080p/24Hz resolution of Blu-ray Discs, and also provides an Auto Lip-Sync function that automatically adjusts the lag between video and audio, and can transmit a double speed Refresh Rate of 100Hz/120Hz.

x.v.Color

When you use the RX-Z11's HDMI outputs to transmit video signals, you enjoy spectacular color performance. One reason is that HDMI 1.3a uses a new color standard called x.v.Color, which supports 1.8 times as many colors as previous HDTV signals. This expanded range of colors means that HDTVs can display images with colors that are far more natural and vivid than ever before.



Deep Color (30/36 Bit) Transmission

The RX-Z11 supports the latest HDMI 30- and 36-bit color depths, improved from the 24-bit depth of previous versions. This "Deep Color" allows the rendering of billions of colors for far greater accuracy. Colors are so vivid they seem to jump off the screen, with perfectly smooth tonal transitions and ultra-fine gradations between colors. It also enables many times more shades of gray, for higher contrast ratio.

30- and 36-bit color depth (Deep Color, left) and current 24-bit depth (right): 30-bit color depth consists 4 times more shades of gray or more.

Handling 1080p/24Hz Resolution

Blu-Ray discs are mastered at 24 frames per second (the same as 35mm movie film) with 1080p resolution. In order to make the most of this high quality, 1080p/24Hz compliant displays and players are being introduced. The RX-Z11 is capable of transmitting the 1080p/24Hz signal to ensure the highest quality throughout the reproduction chain.

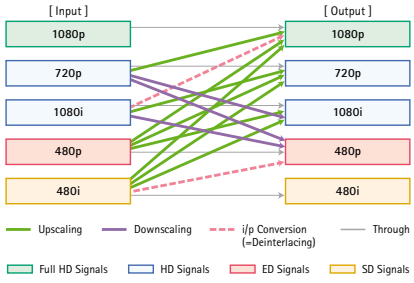
Auto Lip-Sync Compensation

When video and audio signals are transferred via HDMI with the video shown on a display and the audio output by the receiver, the video delay time (time from signal input until it is seen) and the audio delay time (time from signal input until it is heard) are different, so the video and audio slip out of sync. The Auto Lip-Sync compensation function monitors the video delay time and automatically adjusts the amount of audio delay to eliminate the difference, so you hear the dialogue just as the person is speaking.

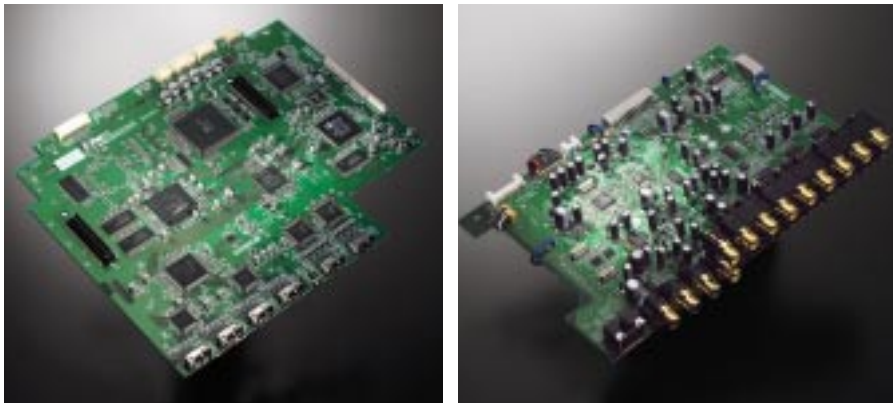
Optimum Video Processing Configuration

After an extensive evaluation of video processing configurations, we found that there is no single chip solution that can achieve optimum system performance for the RX-Z11 in both the SD and HD domains. Therefore we decided to use both a dedicated i/p converter and a dedicated video scaler. The i/p converter (480i to 480p) for SD signals features a 10-bit processing Motion Adaptive Deinterlacing Engine with Enhanced Motion Detection Filter, Diagonal Processing and 2:2/2:3 Pull-Down Detection. The Anchor Bay ABT1018 performs HD processing and includes a 10-bit Precision Video Scaling™ engine that can independently scale images horizontally and vertically to achieve outstanding picture quality. The result is a very stable picture with no jaggies or flicker.

HDMI Video Upscaling (both analog and digital inputs)



Using 10-bit Precision Video Scaling™ engine, upscaling is provided to 1080p. The engine scans images both horizontally and vertically, achieving superb picture quality with all high resolution video displays. It upscales analog composite or S-Video 480i and component 480i or 480p signals to not only 1080i/720p but also to 1080p so they can be output digitally at the HDMI out for viewing on the highest quality full HD displays.



Digital video circuit board (left) and analog video board (right).

iPod not included.

Yamaha Universal Dock for iPod

The optional Yamaha Universal Dock lets you connect your iPod to the receiver. You can listen to your iPod music and watch iPod images and movies on your monitor via the receiver. You can also operate your iPod via the receiver's remote unit with the on-screen display (choice of six languages) and charge your iPod.

Made for iPod

Yamaha Knows What You Want in a Receiver: More Listening Choices, Easier Operation

Network Receiver Capabilities

You can make the RX-Z11 the central component in a versatile home entertainment network. Connect it to your PC, to portable devices, or even to a LAN (Local Area Network). It supports LAN standby mode, allowing an external controller to send commands via an Ethernet link. USB ports front and rear make it convenient to connect portable players, thumb drives and other devices. You get compatibility with PlaysForSure devices, Windows Vista, and various audio codecs such as MP3, WMA, WAV and MPEG-4 AAC.

Network Receiver Function Configuration

YPAO Sound Optimization: Now Even Better...and Far Superior to Other Systems

One of Yamaha's most popular features (praised by reviewers and customers alike), is the YPAO Sound Optimization system. And the RX-Z11 system is even better than previous versions.


Microphone base and optimizer microphone

YPAO (Yamaha Parametric room Acoustic Optimizer) measures and analyzes the acoustics of your home theater room, along with the audio system, and then adjusts numerous settings to deliver the best possible sound quality for the room and even for your listening position. All this is accomplished in just a few minutes.

The receiver comes supplied with a high precision Optimizer Microphone. You simply plug it into the front panel, place it at your normal listening position, and press the Program button. Test tones will be emitted from the speakers, which are picked up by the microphone and then analyzed. Based on the results, a variety of audio parameters are precisely calibrated to optimize the sound at the listening position.

YPAO makes eight separate measurements. Six are related to the speakers: wiring, distance, size, level, equalization and angle. The seventh is standing waves and the eighth is for multiple listening positions (up to eight), if you so desire.

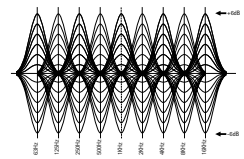
These eight measurements are one reason why YPAO is superior to other "room optimization" systems. Only YPAO analyzes and cancels standing waves, which can degrade low range response, and only YPAO adjusts for multiple listening positions. In addition, YPAO uses parametric, as opposed to graphic, equalization. Parametric EQ, used by professional sound tuning specialists, is far more sophisticated than graphic EQ.

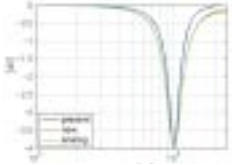
YPAO has one other advantage as well: it provides three different setup options. The first is Quick Automatic Setup, which lets the receiver handle everything, finishing the optimization process in from 30 seconds to five minutes, depending on the room and the system. The second is Basic Automatic Setup, which allows you to customize the measurements and settings via the remote control and on-screen display. The third is Advanced Automatic Setup, which lets you optimize the sound for as many as eight listening positions, and also set speaker angles to optimize the effects of the CINEMA DSP programs.

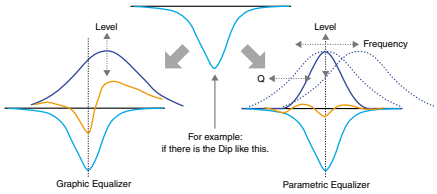

Automatic setup for standing wave cancelling

With the ideal audio optimization provided by YPAO, combined with the awesome sound field formation capabilities of CINEMA DSP, the RX-Z11 brings you a home theater sound experience that is far and away the best possible today...and will surely remain the best for years to come.

Graphic Equalizer vs. Parametric Equalizer

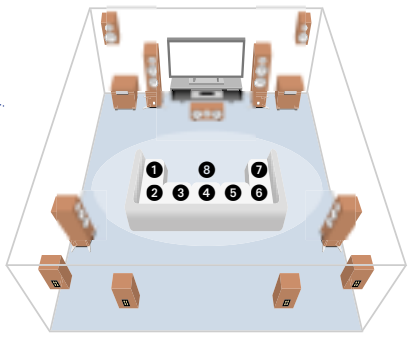

Conventional GEQ


Yamaha Parametric EQ

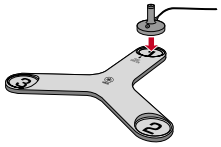


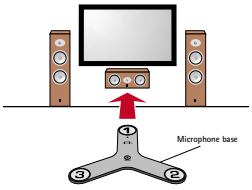
YPAO provides frequency response compensation of all channels via a 10-band parametric equalizer.

Graphic equalizers adjust only the level, while parametric equalizers adjust gain, frequency and Q factor, thus providing more detailed and effective sound equalization.



Multiple listening positions (up to eight)

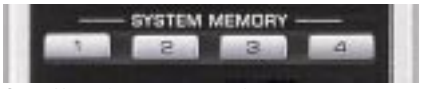

3-point YPAO measurements detect the angle of front, surround, front presence and rear presence speakers from the microphone position.



Taking Versatility Further Than Ever Before: Multi-Zone Functionality and System Memory

System Memory

The System Memory function is extremely useful, letting you save a combination of system settings and preferences for instant recall at any time. In fact, you can save 10 different combinations for the Main Zone and four combinations for each of the other three zones. The current system settings can be stored by pressing the corresponding System Memory buttons on the remote. You can also give each memory a name so you can easily remember them (for example, "Action Movies" or "Rock Music").



System Memory buttons on remote unit.


System Memory default setting.


Four System Memory settings for each of the sub-zones.


System Memory rename setting.


10 System Memory settings for Main Zone.

Super-Versatile Zone Control

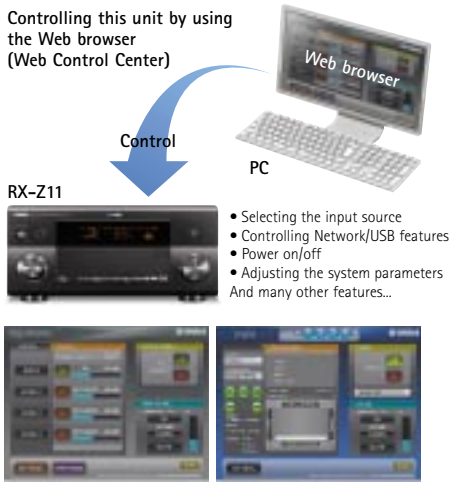
The RX-Z11 has extensive zone control capabilities, which are too numerous to explain here. The most important point is that the 11.2 channels can be assigned in a wide variety of configurations to four zones. The presence, rear presence and EXTD (by surround back amp) speaker terminals can be assigned to each zone. It provides Intelligent Power Amplifier Assignability (surround back amp assignment) and Independent Zone Amplifier Assignment with 7.2-channel main zone playback.

Also important is that Zone 2 can accept bitstream signals and also offers component video output and upconversion of composite and S-Video signals.

Some other convenient zone functions include: a Party Mode that permits audio BGM and video BGV play of the same input source in the main room and other three zones with one-button operation, a Zone OSD function that displays the operational status of all zones including iPod and network/USB menus. Zone Mono that provides compatibility with one-speaker or three-speaker installation environments, and a Preamplifier Mode that permits the entire 11-channel amplifier to be allotted for three-zone use (main zone powered by an external amp).

Web Browser Control

With the RX-Z11 connected to a PC by an ethernet link, you can access various functions via a Web browser. The Web Control Center graphical user interface will appear on the browser, allowing you to select sources and DSP programs, search your iPod library and Net Radio stations, and control play start/stop, volume level and much more.

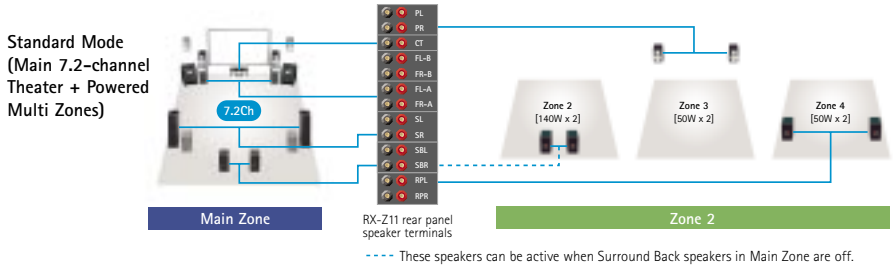


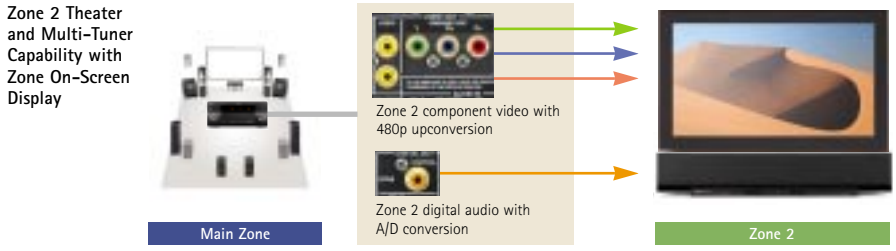
THX Ultra2 Plus

The RX-Z11 is the world's first receiver to offer THX Ultra2 Plus, which includes THX Loudness Plus technology. THX Ultra2 Plus lets you turn down the volume while retaining the soundtrack's proper tonal balance and imaging. The new THX Cinema, THX Music, and THX Games modes are tailored to apply the proper THX Loudness Plus settings for each type of content.

Improved Compressed Music Enhancer

Yamaha's Compressed Music Enhancer is a popular feature that restores the sound of the original music from digitally compressed formats such as MP3. The RX-Z11 offers an upgraded version that processes multi-channel signals with a DSP algorithm, so all channels (rather than just two) are enhanced. This provides more accurate reproduction and a more expansive sound.

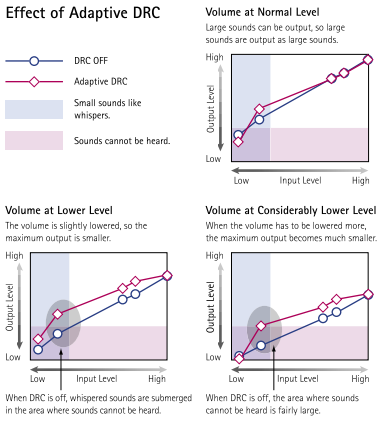




The RX-Z11's zone 2 component video and coaxial digital audio terminals can establish a "High quality Zone 2 theater" that offers HD video pass-through as well as 480p upconversion of composite/S-Video signals, crystal clear digital audio bit streams (Dolby Digital or DTS), stereo PCM or even analog signals converted to PCM. Also RX-Z11 has Multi-tuner/Multi-media source capability with Zone on-screen display available with Zone 2, 3 and 4 to meet requests of custom professionals.

Adaptive DRC

Adaptive DRC (Dynamic Range Control) is a new volume control technology that is effective for low-volume listening, such as at night or with headphones. It applies DRC processing to eliminate the volume differences between loud commercials and ordinary programming and to take into account our ears' loss of sensitivity as volume decreases. The compensation is performed automatically, so you hear all dialogue clearly even at low levels, and there are no sudden loud bursts of sound.



Main Remote Unit with Instant Illumination

The remote unit incorporates a motion sensor that illuminates the buttons for easy operation in dim lighting — just pick it up and the buttons light up. It features an easy-to-use key layout and an LCD window: the layout setup buttons (zone selector, macro mode, remote ID, remote setup and input select) are grouped around the LCD window. It also provides easy access to the System Memories and is learning- and preset-capable.

The main remote unit has a logical layout and self-illuminating buttons. A simplified remote unit is also supplied (left).

Extensive Connection

Front Panel

Oil-Damped Hidden Control Panel includes HDMI jack, USB port, Aux input terminals with S-Video and optical digital, Zone 2/Zone 3/Zone 4 power on/off switches, Rec Out/Zone 2 selector, YPAO optimized microphone jack, and more.

Rear Panel

Inputs	
HDMI*	5
USB*	2
XM Connect-and-Play	1
Dock Terminal for Optional iPod Dock	1
Optical Digital (Fixed and Assignable)*	5
Coaxial Digital (Fixed and Assignable)	4
S-Video*	6
Analog A/V / Audio*	6 / 4
Component Video (Fixed and Assignable)	4
Radio Antenna (HD/FM/AM)	1 / 1 / 1
Multi-Channel External Decoder	8ch or 6ch

* Including front panel terminals.

Outputs	
HDMI	2
Optical Digital (Fixed and Assignable)	1
Analog A/V / Audio	2 / 2
S-Video	2
Component Video Monitor	2
S-Video / Composite Monitor	1 / 1
Speaker (without subwoofer)	11ch / 13 ter.
Subwoofer (L/R or Front/Rear: Selectable)	2

Others	
Multi Zone Video Out (Component/Composite)	1 / 2
Zone 2 Audio Out (Analog Audio/Coaxial)	1 / 1
Zone 3 Audio Out	1
Zone 4 Audio Out	1
Remote In/Out	2 / 2
Trigger Out	2
RS-232C	1
Terminal for Detachable Power Cable	1

RX-Z11 Specifications

AUDIO SECTION		
Minimum RMS Output Power (8 ohms, 20 Hz–20 kHz, 0.04% THD)		
Front Channels		140 W + 140 W
Center Channel		140 W
Surround Channels		140 W + 140 W
Surround Back Channels		140 W + 140 W
Presence Channels		50 W + 50 W
Rear Presence Channels		50 W + 50 W
Dynamic Power (8/6/4/2 ohms, Front L/R)		185/230/290/385 W
Damping Factor (8 ohms, 1 kHz, Speaker A)		150
Input Sensitivity/Impedance (1 kHz, 100 W/8 ohms) [Multi-Channel In]	Phono MM	3.5 mV/47 k-ohms
	CD, etc.	200 mV/47 k-ohms
	Front L/R	200 mV/47 k-ohms
	Center	200 mV/47 k-ohms
	Surround L/R	200 mV/47 k-ohms
	Subwoofer	200 mV/47 k-ohms
Frequency Response (Front L/R)	CD, etc.; Pure Direct On	10 Hz–100 kHz +0, -3 dB
RIAA Equalization Deviation	Phono MM	20 Hz–20 kHz 0±0.5 dB
Total Harmonic Distortion	Phono MM (Rec Out, 1 V)	0.02%
(20 Hz–20 kHz)	CD, etc. Sp Out, 70 W/8 ohms	0.02%
Signal-to-Noise Ratio	Phono MM (Sp Out)	81 dB (5 mV)
(IHF-A Network, Input Shorted)	CD, etc. (Sp Out)	100 dB (250 mV)
Residual Noise (IHF-A-Network)	Front L/R, Sp Out	70 µV
Filter Characteristics		
FL/FR/C/SL/SR/SBL/SBR (Small)	12 dB/oct.	
H.P.F. (Variable Crossover)	(fc [9 bands]=40/60/80/90/100/110/120/160/200 Hz)	
Subwoofer	24 dB/oct.	
L.P.F. (Variable Crossover)	(fc [9 bands]=40/60/80/90/100/110/120/160/200 Hz)	

VIDEO SECTION		
Composite Video Signal Level		1 Vp-p/75 ohms
S-Video Signal Level	Y	1 Vp-p/75 ohms
	C (NTSC)	0.286 Vp-p/75 ohms
	C (PAL)	0.3 Vp-p/75 ohms
Component Video Signal Level	Y	1 Vp-p/75 ohms
	Pb, Pr	0.7 Vp-p/75 ohms
Signal-to-Noise Ratio		70 dB (V comv off)
Monitor Out Frequency Response		5 Hz–100 MHz ±3 dB
Component Video Signal		(V comv off)

TUNER SECTION		
	(1 kHz, 100% Modulation)	
FM 50dB Quieting Sensitivity	Mono	2 µV (17.3 dBf)
	Stereo	25 µV (39.2 dBf)
FM Selectivity	400 kHz	70 dB
FM Signal-to-Noise Ratio (IHF)	Mono	76 dB
	Stereo	70 dB
FM Frequency Response	20 Hz–15 kHz	+0.5/–2 dB
AM Usable Sensitivity		300 µV/m

GENERAL SECTION	
Standby Power Consumption	0.1 W or less
Dimensions (W x H x D)	17-1/8" x 8-1/4" x 19-9/16"
Weight	75 lbs.

CINEMA DSP DIGITAL

Yamaha's unique technology for the creation of sound fields is capable of powerfully reproducing the three-dimensional environment that movie sound engineers aim to convey, in any audio format from monaural to the latest multi-channel digital surround. It is compatible with DVD and all other A/V sources. Yamaha CINEMA DSP technology has received a patent in the U.S. (Patent No. 5,261,005).

For details please contact:

Yamaha Electronics Corporation
USA, P.O. Box 6660 Buena Park, CA 90622
Visit us at our website : http://www.yamaha.com/yec

YAMAHA

CREATING 'KANDO' TOGETHER

YAMAHA CORPORATION
P.O. Box 1, Hamamatsu, Japan

P10020311
UEN 10803 M