YAMAHA CA-1010

Natural Sound Integrated Stereo Amplifier

Ultra-low distortion, switchable class A operation

Completely independent listening and recording

Built-in full-fidelity MC cartridge head amp

Wide-range multi-function level meters

Yamaha: Dedication to Musical Excellence

Today the world's largest manufacturer of musical instruments is also a leader in audio fidelity. For nearly a hundred years Yamaha craftsmen have been designing full, natural sound into our renowned pianos, organs, wind and string instruments—a rich musical tradition that makes us unique in the audio world. Part of the reason is our generations of musical sensitivity. But it's also due to our immense technological and production capabilities—built over decades of supplying fine musical instruments to the world.

The Basics

Audio performance depends upon a wide range of technologies. While Yamaha's computer-controlled circuit design and testing is second to none, our musical instrument experience has given us expertise in many other crucial fields. The Yamaha factories which produce LSIs and semiconductors for our electronic organs were also important in the development of the revolutionary Yamaha vertical FET used in our top-line B-I power amplifier and C-I preamp. They are also responsible for our unique vapor deposition production of the world's only pure beryllium dome speaker diaphragms. After years of blending and forming the metals in our brass instruments, we were able to develop the special alloys used in our powerful speaker magnets. Piano frame diecast techniques are behind the ideal weight and acoustic properties of our turntable platters and speaker frames. And Yamaha piano soundboard research and cabinet woodcrafting is reflected in our resonant-free speaker enclosures and beautifully detailed component cabinetry.

In-House

Every crucial part of every Yamaha audio component is Yamaha-made. That's how we set our own quality standards. And that's how we can afford to innovate every step of the way: when a part or material doesn't do justice to the music we simply develop one that does.

The Payoff

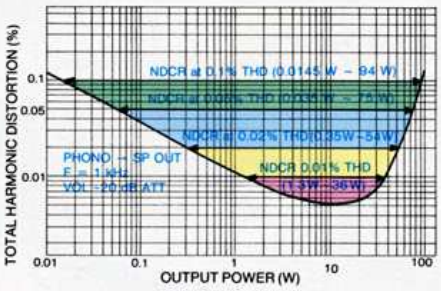
When you have musicians and audio engineers speaking the same language the result is full natural sound fidelity, plus innovative features which translate directly into improved tonality or operating convenience. Yamaha's insistence on total music performance, not just isolated specs, is behind a revolutionary new approach to audio component design—one that gives the CA-1010 integrated amplifier (as well as all other models in the line) music fidelity audibly superior to many separate preamp and power amplifier combinations.

Total-Performance Balanced Design

Instead of putting our development muscle into the power amp section alone, Yamaha engineers paid the same attention to every section, including the phono equalizer and preamp stages. By designing each section to the same high standards we made sure there are no weak links in the CA-1010; at the same time we matched each section from its very first design stages to the others, so they all work together for superb music fidelity. That's why we dare to publish overall performance specifications, from Phono In to Speaker Out.

NDCR: the Big Difference

The CA-1010 was designed with a new aim: superb performance under *actual in-home listening conditions.* To do so, we developed a new performance standard: Noise-Distortion Clearance Range. NDCR expresses a performance range—the range of output powers from the low point where noise is an unacceptable percentage of the signal, to the high level where distortion rises above rated limits. That tells you more than a single-level measurement.
Just as important: measurements are overall, from Phono In to speaker outputs (instead of using the Aux In jack which bypasses the phono equalizer). And rather than measure at the unlistenable maximum volume (0 db) setting, NDCR is taken at a normal volume level: -20 dB. Some amplifiers show noticeably worse S/N, distortion, and even frequency response characteristics when the volume is turned down to half. The CA-1010's NDCR range is superb: 100 mW to 90 W. This is especially meaningful when you remember that at normal listening levels a pianissimo passage is app. 100 mW, while average power to your speakers is 1-2 watts and brief peaks can reach 90 W. So the CA-1010 gives you the assurance of full, pure fidelity for any selection at any listening level.



In the Great Tradition

Yamaha offers one of the world's most powerful and complete home audio component systems, our famous B-I, B-2 basic amps, C-I, C-2 preamps and CT-7000 tuner. But with the CA-1010's excellent cost performance you get many of the unique features and circuit improvements developed for this series.

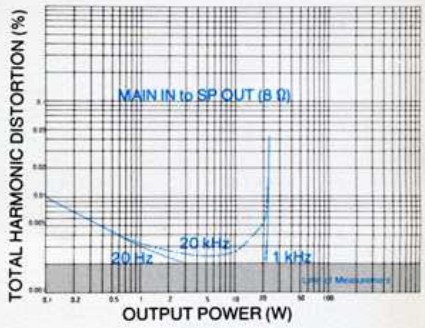
THE POWER AMP

Unbelievable 0.03% Distortion!

When Yamaha's first amplifier line appeared with only 0.1% distortion audiophiles were astounded. But now we've betterd that by cutting total harmonic distortion to an incredible 0.03% in the CA-1010 (20 to 20,000 Hz, 8 ohms, both channels driven at rated output). This significant improvement on state-of-the-art performance means even cleaner, purer performance.

Output Power vs. Total Harmonic Distortion (Class B operation, both channels driven)

Output Power vs. Total Harmonic Distortion (Class A operation, both channels driven)



Switchable Class A Operation

Yamaha was the first to offer switchable class A and normal transistor amp class AB operation, and it's yours on the CA-1010 for incredibly low distortion to bring out the best in delicate music passages.
Class A employs the CA-1010 transistors without switching between elements for high-power efficiency. This means none of the notch and crossover distortion present in all class B amplifiers. With class A, the CA-1010 gives you 18 watts per channel (both channels driven into 8 ohms, 20 to 20,000 Hz), with no more than an incredibly low 0.005% total harmonic distortion! That's plenty of power for headphones, efficient speakers and normal listening levels, plus gloriously clean, transparent music response. And if you want more power, just switch to Normal mode and the output figure jumps to 90 watts per channel.

Distortion Waveform for Class A Operation (Both channels driven into 8 Ω at 15 W)

Distortion: 0.0025%
Vertical sensitivities: 5 V, 50 mV/div.
Horizontal sensitivity: 5 μsec./div.

Wide Range Peak Delay Meters

With their quick 100 μsec. rise time, these meters indicate even the briefest transient bursts. Their wide range lets them show a whisper-quiet 1 mW and a thundering 316 W peak (with 8-ohm speakers)—that means they won't peak out during dynamic passages. Meter calibration is in both watts and decibels (-50 to +5 dB).

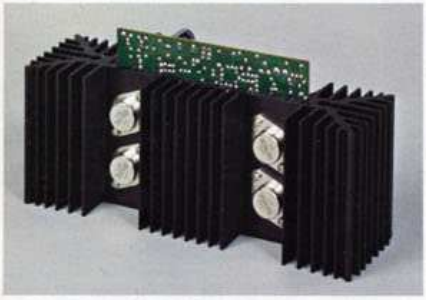
Rec Out Too

Just as on our top-line C-I preamp, the CA-1010 meters can be switched to show the signal level at the Rec Out jacks (indicated in mV). This means no-guesswork setting of tape deck input signals to keep recording levels above the tape noise limit, but within the range of distortion-free performance.

Unique Temperature Protection

The output transistors work full time during class A operation, and to dissipate their heat the CA-1010 uses massive, low thermal capacity heat sinks. In addition, special monitoring circuits constantly check power transistor current in a unique Area of Safe Operation (ASO) system. Input level is reduced as soon as excess current is sensed, or if speaker impedance drops below 4 ohms. This protects the amp and speakers against shorts and misconnection.

Heat Sinks



115 dB Power Amp S/N Ratio

Painstaking computer-assisted circuit design gives the CA-1010 incredibly quiet operation, so even during the soft parts of your most dynamic music selection the signal level is still far above the noise threshold.

THE PREAMP

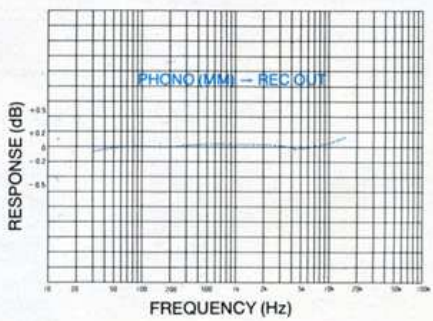
Pre Out/Main In Plus...

You can feed the CA-1010 preamp signal out to a frequency divider, dbx or Dolby unit, or a frequency equalizer, then back in to the main amp or to another power amp. The rear panel coupler switch has terminals shielded inside the chassis, instead of external jumpers which often pick up interference.
The Pre Out jacks are also live during normal operation, so you can oscilloscope-check the signal or drive another power amp without interrupting your program. Use them for recording and you can "process" the signal to the tape deck using the tone controls and filters.

Super-Quiet Equalizer Amp

Special Yamaha-developed low-noise FETs are incorporated in the CA-1010 equalizer, in perfectly matched pairs (they are even housed in a single package to assure equal temperature effects). These ICs are used in a cascode-bootstrap current mirror circuit similar to the one on our prestigious C-2 preamp. The circuit provides an outstanding 96 dB signal-to-noise ratio (10 mV input, IHF A network, inputs shorted), with less than 0.003% Phono to Rec Out distortion, 20-20,000 Hz! This level is just about the measurable limit for the finest test equipment.

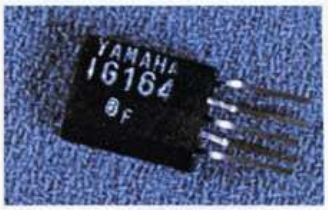
RIAA Deviation (Phono MM to Rec Out)



Built-In High Performance Head Amp

Your present phono cartridge may sound fine today, but once you become accustomed to the subtle beauties of class A performance you may want the improved tonal nuances of a moving coil cartridge. Normal phono inputs cannot handle the MC cartridge's low output level, however, and until now this has required a high-cost head amp unit or the performance limitations of a step-up transformer.
The CA-1010 solves the problem. It has a built-in head amp, switchable from the front panel. Incorporating special Yamaha IC circuitry, it provides incredible frequency response for superb music fidelity, a remarkable 84 dB S/N ratio (250 μV input, IHF, A network), and extremely low 0.03% distortion (3 V output) from 20 to 20,000 Hz.

Super Low Noise IC



Switched Phono Impedance

In addition to its MC cartridge setting, the CA-1010 selector has three other Phono 1 settings: 47 kΩ, 68 kΩ and 100 kΩ. This lets you match cartridge impedance characteristics and experiment with the subtle tonal response effects of different settings.

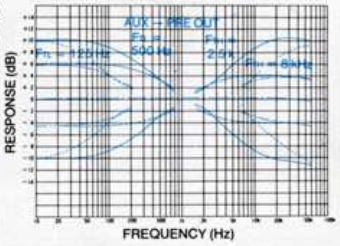
Precision Four-Gang Volume Control

Introduced on our famous C-I and C-2 preamps, this type of control not only adjusts the volume at the tone control section input side, but also at its output. That means you turn down the preamp residual noise when you reduce the volume, and the system avoids full-gain power amp operation during reduced-volume listening.

Tone Controls & Filters

Tone Controls

The separate controls for bass and treble ranges each have dual turnover frequencies plus a Defeat position: full equalizer-type versatility. They provide range selection and sure, delicate adjustment of the tone color to equalize for room acoustics or irregular speaker response, as well as letting you tailor the music to your mood.



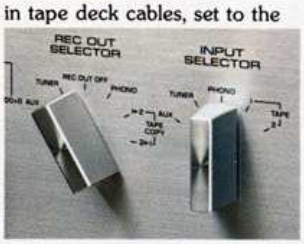
Tone Control Characteristics

Filters

Both of these filters have sharp 12 dB/octave cutoffs, for clean, efficient operation. The 10 kHz high filter can be used to cut record scratch noise, as well as hiss from tapes and weak FM signals. During normal operation leave the 15 Hz subsonic filter on to boost overall power by eliminating the power-robbing subsonic noise generated by warped records or line noise.

Rec Out Selector

With the CA-1010 you can record any source selected by the Rec Out selector, and at the same time listen to that *or any other* source chosen with the Input selector. Listen to an FM program while taping a record, or copy tapes while listening to a record or tuner program; with two decks connected you can copy tapes in either direction. To avoid possible distortion from stray capacitance in tape deck cables, set to the special Rec Out Off position when not recording.



Other Important Features

- **Terminals for Two Sets of Speakers with Front Panel Switching**
- **Three-Position Audio Muting: 0 dB/ -20 dB/Pre Out Off**
- **Stereo Headphone Jack**
- **Large Easy-Use Volume and Balance Controls**
- **Four Auxiliary AC Outlets**

SPECIFICATIONS

MINIMUM RMS OUTPUT POWER PER CHANNEL (CLASS B)
120 Watts (4 ohms) from 20 to 20,000 Hz at no more than 0.03% Total Harmonic Distortion
90 Watts (8 ohms) from 20 to 20,000 Hz at no more than 0.03% Total Harmonic Distortion

MIN. RMS OUTPUT PER CHANNEL (both channels driven)	
Class A (20 to 20 kHz, 8 Ω)	18 watts
Class B (1 kHz, 8 Ω)	90 watts
TOTAL HARMONIC DISTORTION, 20 to 20,000 Hz	
Phono 1 (MM), 2 to Rec Out	0.003% at 10 V output
Phono 1 (MC) to Rec Out	0.03% at 3 V output
Tuner, Aux to Pre Out	0.005% at 3 V output
Main In to Sp Out (8 Ω)	Class A: 0.005% at 10 W
	Class B: 0.01% at 50 W
Tuner to Sp Out (8 Ω)	Class B: 0.01% at 50 W
IM DISTORTION (Aux to Sp Out)	0.03%, 250 mW to 90 W
INPUT SENSITIVITY/IMPEDANCE	
Phono 1 (MM)	2 mV/47, 68 or 100 kΩ
Phono 2 (MM)	2 mV/47 kΩ
Phono 1 (MC)	50 μV/10 Ω
Tuner, Aux	120 mV/50 kΩ
Main In terminals	1 V/25 kΩ
MAXIMUM INPUT LEVELS (1 kHz, 0.02% THD)	
Phono 1 (MM), 2	310 mV
Phono 1 (MC)	7.5 mV
Tuner, Aux	20 V
OUTPUT LEVEL/IMPEDANCE	
Rec Out terminals	120 mV/600 Ω (rated), 18.6 V (max. 1 kHz)
Pre Out terminals	1 V/500 Ω (rated), 7 V (max. 1 kHz)
FREQUENCY RESPONSE	
Phono 1, 2 RIAA deviation	±0.2 dB
Tuner to Pre Out	5 Hz to 100 kHz, +0, -1 dB
Tuner to Sp Out	5 Hz to 50 kHz, +0, -1 dB
POWER BANDWIDTH (8 Ω, 0.02% distortion)	
Class A	10 Hz to 70 kHz
Class B	10 Hz to 50 kHz
TONE CONTROL CHARACTERISTICS	
Bass turnover frequencies	125 and 500 Hz
Bass boost/cut	±10 dB at 20 Hz (for 500 Hz)
Treble turnover frequencies	2.5 and 8 kHz
Treble boost/cut	±10 dB at 20 kHz (for 2.5 kHz)
FILTERS	
Subsonic	15 Hz (12 dB/octave)
High	10 kHz (12 dB/octave)
SIGNAL-TO-NOISE RATIO (IHF-A Network)	
Phono 1 (MM), 2	96 dB (for 10 mV, shorted)
Phono 1 (MC)	84 dB (50 Ω, shorted)
Aux, Tuner	100 dB
Main	115 dB
Residual noise (at Vol. min.)	Less than 0.1 mV
NOISE DISTORTION CLEARANCE RANGE (NDCR) for 0.1% into 8 Ω, 20 Hz to 20 kHz, from 100 mW to 90 watts with Vol. -20 dB (Phono In (MM) to Sp Out)	
DAMPING FACTOR (at 1 kHz)	Better than 45 into 8 Ω
METERS	
Rise time	100 μsec.
Decay time	0.95 sec.
Range	1 mW to 316 W (8 Ω)
	(-50 dB to +5 dB)
GENERAL	
SEMICONDUCTORS	108 Transistors, 67 Diodes, 6 FETs,
	2 Dual FETs, 1 LED, 2 ICs
POWER SUPPLIES	U.S.A. and Canada: AC 120 V, 60 Hz
	Australia: AC 240 V, 50 Hz
	Other Areas: AC 110/120/130/220/230/
	240 V, switchable; 50/60 Hz
POWER CONSUMPTION	U.S.A. and Canada: 450 W
	Other Areas: 900 W
DIMENSIONS (W × H × D)	461 × 170 × 360 mm
	(18⅛" × 6⅝" × 14¼")
WEIGHT	U.S.A. and Canada: 19 kg (41 lbs., 13 oz.)
	Other Areas: 20 kg (44 lbs.)

Specifications subject to change without notice.

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