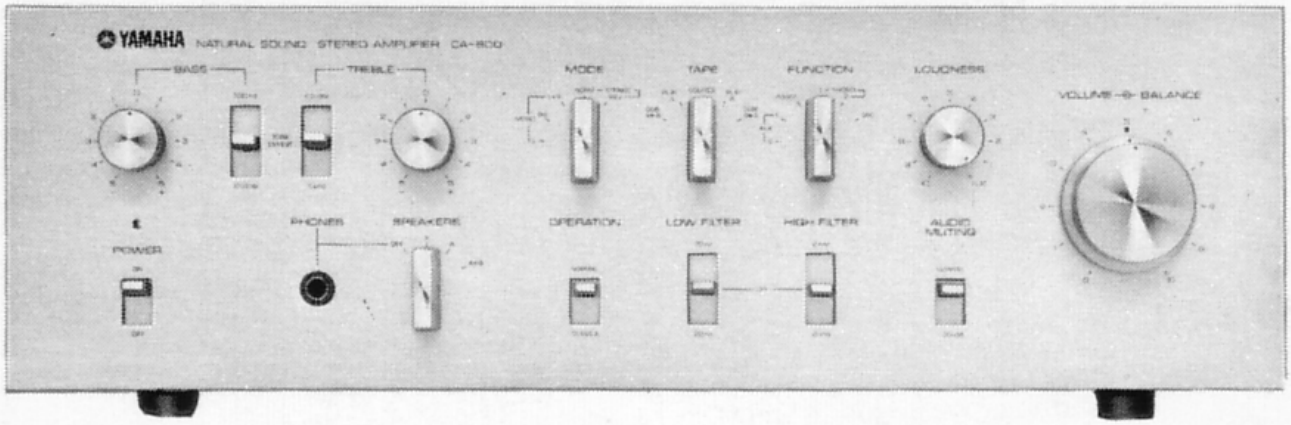
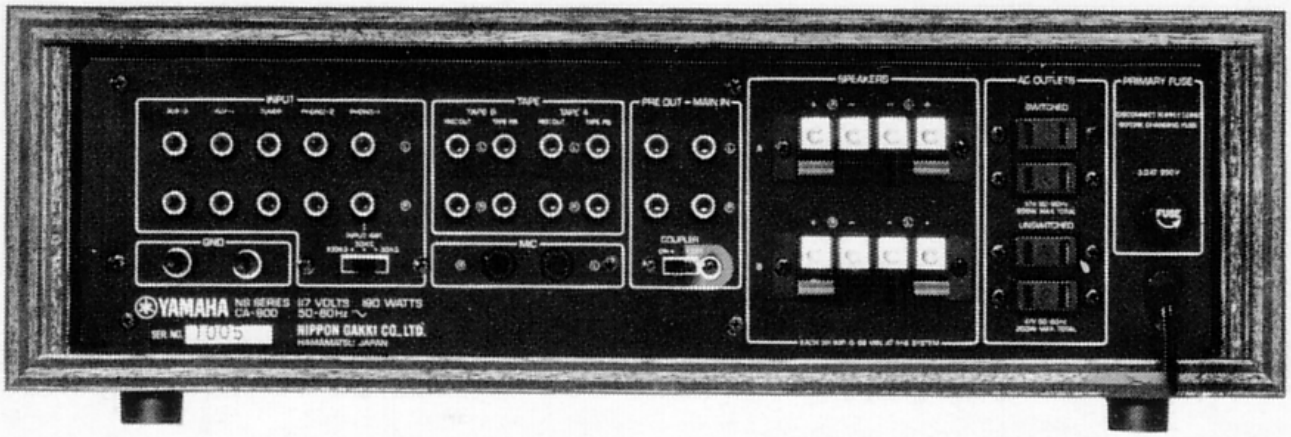
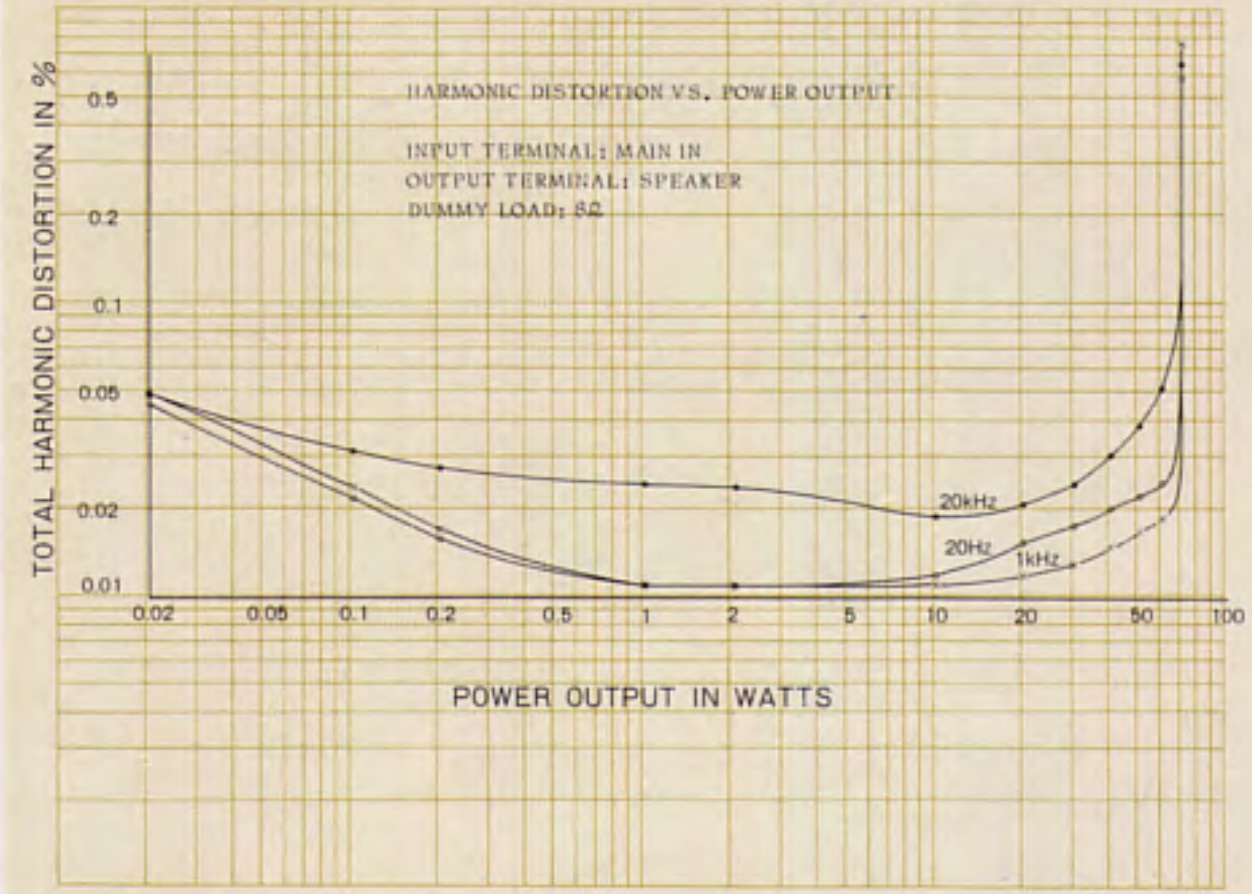
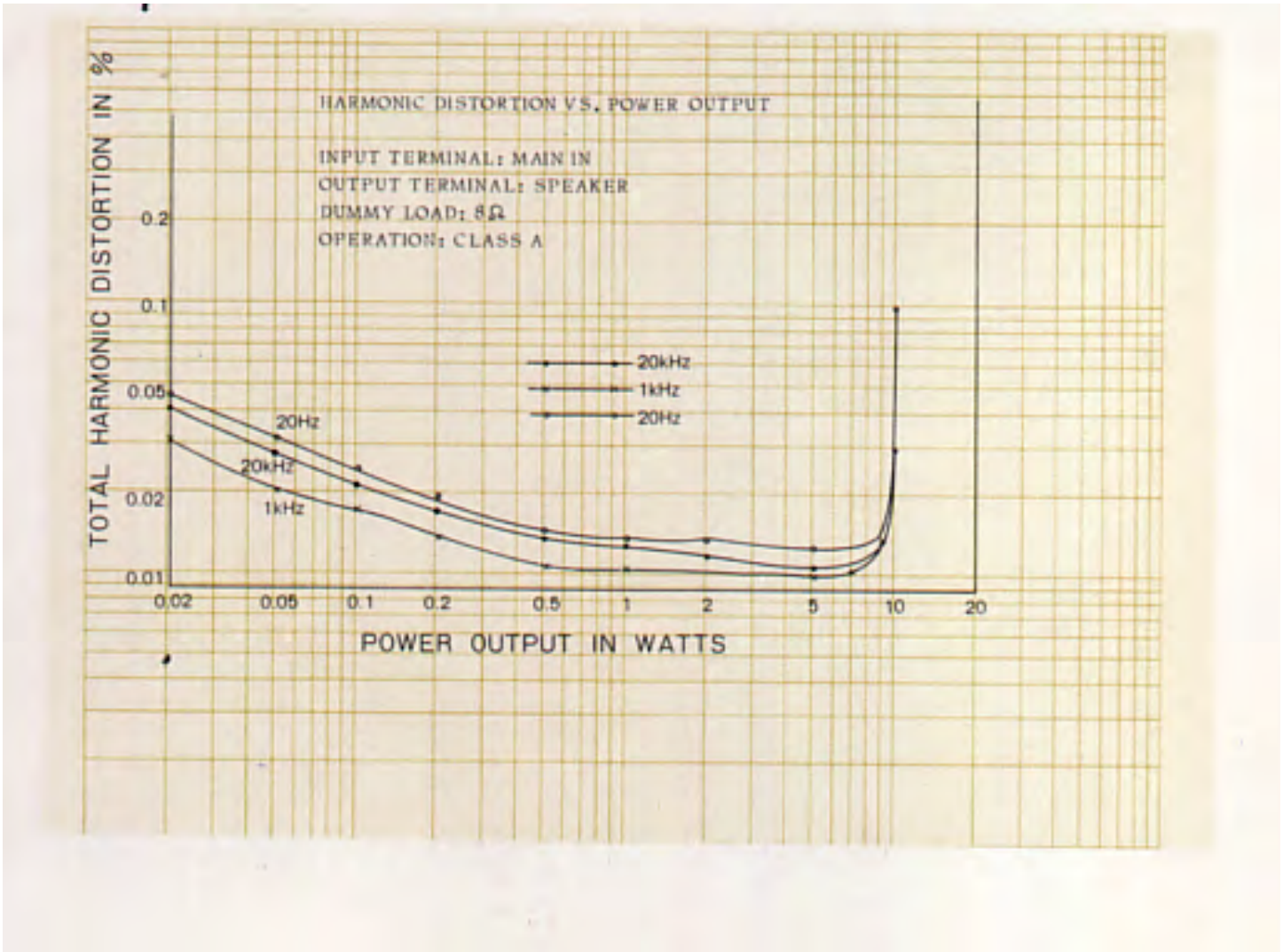
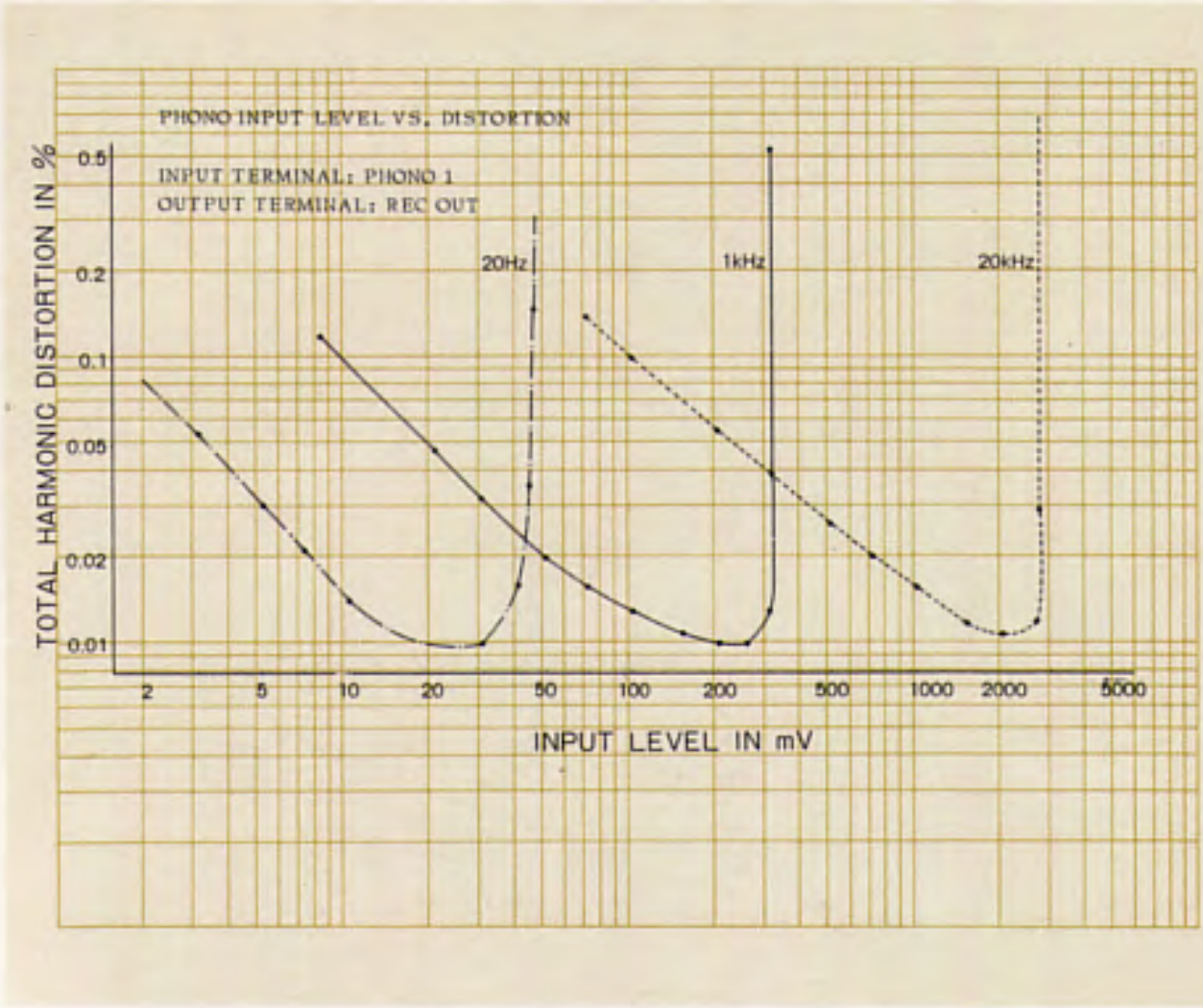

YAMAHA NATURAL SOUND STEREO AMPLIFIER CA-800
BASS
TREBLE
MODE
TAPE
FUNCTION
LOUDNESS
VOLUME
BALANCE
POWER
PHONES
SPEAKERS
OPERATION
LOW FILTER
HIGH FILTER
ALOC MUTING


INPUT
TAPE
PRE OUT – MAIN IN
SPEAKERS
AC OUTLETS
SWITCHED
UNSWITCHED
PRIMARY FUSE
GND
MIC
COUPLER
YAMAHA NS SERIES
CA-800
117 VOLTS 60 WATTS
50-60Hz
NIPPON GAKKI CO.,LTD.
HAMAMATSU JAPAN

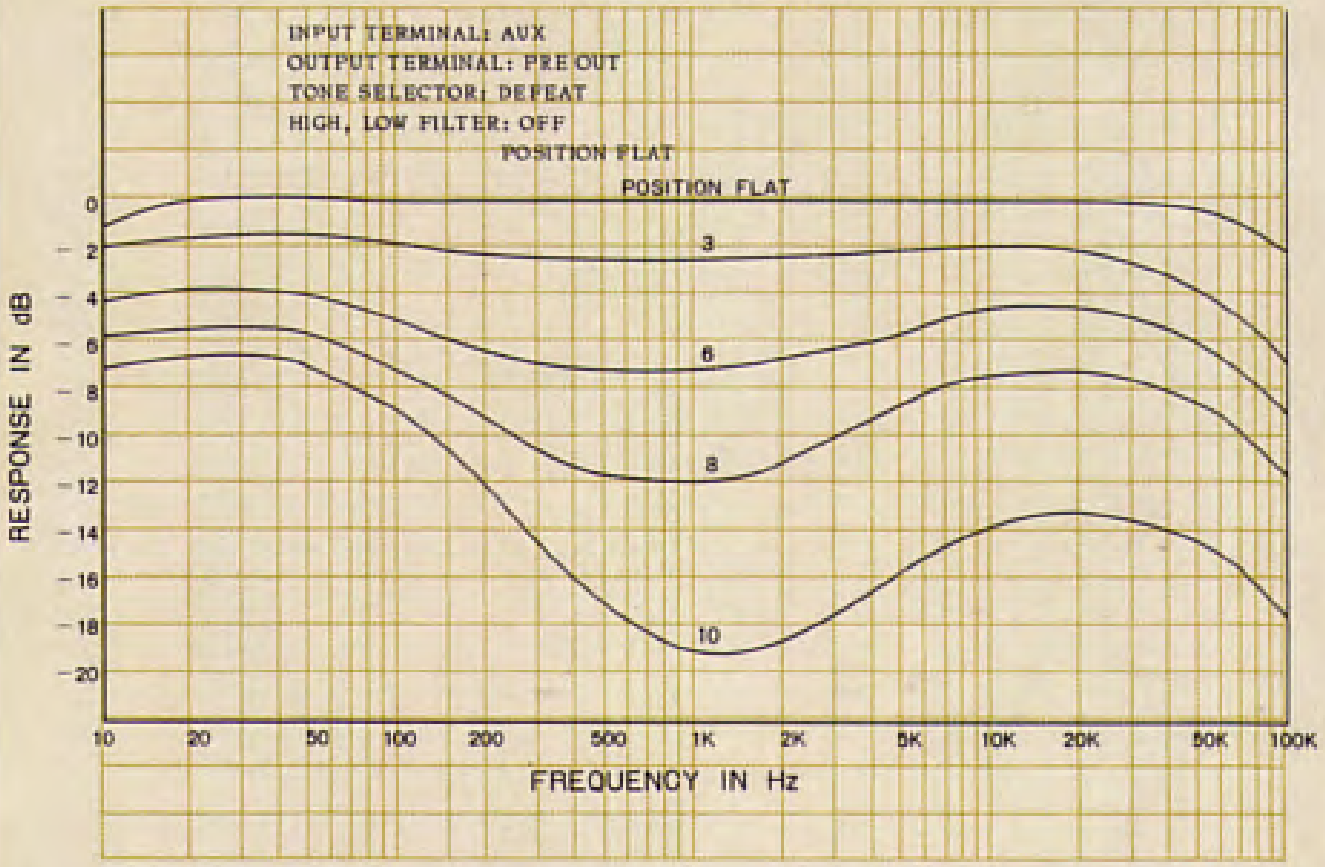
Direct-Coupled OCL Pure Complementary Stereo Power Amplifier For High Power and Low Distortion




HARMONIC DISTORTION VS. POWER OUTPUT
INPUT TERMINAL: MAIN IN
OUTPUT TERMINAL: SPEAKER
DUMMY LOAD: 8Ω
OPERATION: CLASS A
TOTAL HARMONIC DISTORTION IN %
0.2
0.1
0.05
0.02
0.01
20kHz
1kHz
20Hz
20Hz
20kHz
1kHz
0.02
0.05
0.1
0.2
0.5
1
2
5
10
20
POWER OUTPUT IN WATTS


PHONO INPUT LEVEL VS. DISTORTION
INPUT TERMINAL: PHONO 1
OUTPUT TERMINAL: REC OUT
TOTAL HARMONIC DISTORTION IN %
0.5
0.2
0.1
0.05
0.02
0.01
20Hz
1kHz
20kHz
2
5
10
20
50
100
200
500
1000
2000
5000
INPUT LEVEL IN mV

CHARACTERISTICS OF LOUDNESS CONTROL



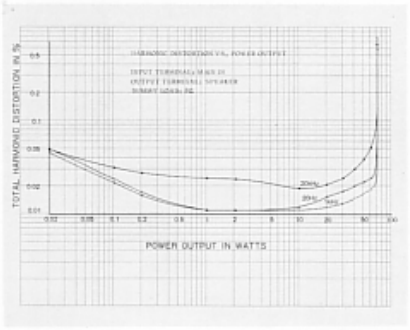
YAMAHA CA800

STEREO INTEGRATED AMPLIFIER WITH CLASS-A POWER AMPLIFIER

Sound reproduction perfection in an advanced stereo integrated amplifier.

The Yamaha CA-800 stereo integrated amplifier offers, at a surprisingly agreeable price, a host of impressive performance features. Like the more expensive Yamaha CA-1000, the CA-800 has been created with emphasis on its primary function, that is to amplify the stereo signals from different program source components with the least possible distortion and without any other form of undesirable coloration. It accomplishes this objective by the use of a direct-coupled OCL complementary power amplifier, a plus/minus dual power supply system, a 3-stage direct-coupled tone control amplifier, and many other advanced features. You will note immediately that the CA-800 is designed with typical Yamaha attention to fine detail.

Direct-Coupled OCL Pure Complementary Stereo Power Amplifier For High Power and Low Distortion

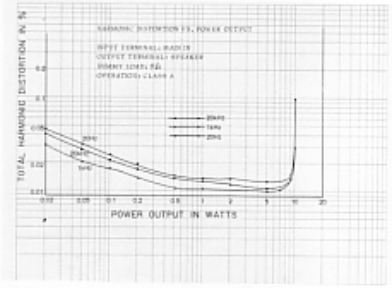


The power amplifier of the CA-800 is the most advanced made today. This is the all-stage direct-coupled OCL pure complementary design which provides flat, linear amplification over an extremely wide bandwidth. Power for its operation is derived from an advanced plus/minus dual power supply system that combines an over-sized transformer and a pair of large 6,800μF capacitors. Moreover, the power supply system drives all amplification stages, with the exception of the power amplifier, at a constant voltage. Such advanced design characteristics contribute greatly to the CA-800's low-range frequency response and stability, as well as to excellent performance specifications. These include RMS continuous power output of 45 watts per channel into 8 ohms, 20 - 20,000Hz, both channels driven at 0.1% T.H.D.; or 55 watts into 8 ohms, 1kHz, each channel driven, also at 0.1% T.H.D.; total harmonic distortion of 0.04% or less over the 20 - 20,000Hz range at an output of one watt. Pure, clean sound reproduction—quite enough to fill a large listening room—is only one solid reason to choose the CA-800.

Class-A Stereo Power Amplifier for Even Lower Distortion

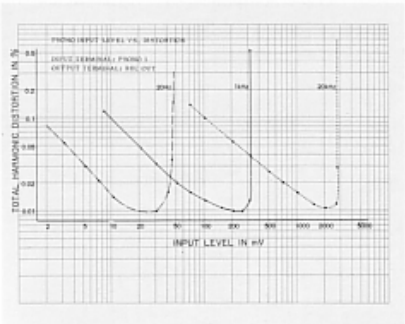
While the CA-800 is complete with a large stereo power amplifier of the Class-B operation like any other stereo amplifier available today, it also has an exclusive feature: a switch to alter the circuit configuration of the power amplifier and convert it to a quality Class-A power amplifier. The difference is significant. A Class-B amplifier is a very effective design for transistor-type amplifiers, and delivers a high power output. A Class-A amplifier, in comparison, is less efficient,yet compensates for its inefficiency by virtually eliminating crossover distortion, which is the major source of distortion in the high frequency range for a transistor amplifier.

These figures underscore the importance of a Class-A amplifier: the RMS continuous power output is reduced to 10 watts per channel into 8 ohms, both channels driven, at a total harmonic distortion of 0.1% over 20 - 20,000Hz. That same distortion figure is reduced to 0.02% or less over 20 - 20,000Hz at an output of one watt, or even to 0.015% —the very limit of the measuring instruments themselves—at 20KHz at an output of 8 watts. Obviously, there is simply no better amplifier type to reproduce the transparent, delicate sounds of string instruments at a low volume level. Another conclusion is equally apt: the CA-800 is a most versatile stereo amplifier.



Four-Stage Direct-Coupled Phono Equalizer Amplifier For Transparent Tonal Quality

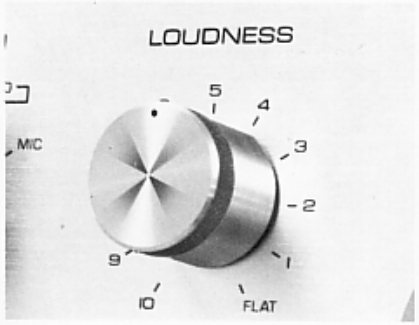
Since the phono equalizer enables the reproduction of the most popular source of music, the disc record, it is the key component of any hi-fi preamplifier. In the CA-800, this component is of the very highest quality, an advanced 4-stage direct-coupled amplifier employing selected low noise transistors. The virtures of this amplifier are three-fold: One, it is capable of handling a phono input signal of up to 310 millivolts, or approximately 100 times greater than what is required to drive it to the full output (input sensitivity is 3 millivolts). This capability is significant insomuch as that it practically exceeds the wide dynamic range offered these days by the latest and most advanced disc cutting techniques, as well as the new and improved pickup cartridges. Thus, you can be assured that every subtle shade of sound and every powerful burst of sound cut into your records will be reproduced without distortion. Secondly, the phono equalizer has an excellent signal-to-noise ratio of 80dB or better. This also contributes to the transparency of reproduced sound. Thirdly, absolute accuracy in the reproduction of stereo records is assured, since the phono equalizer provides an almost identical facsimile of the RIAA disc playback characteristic, keeping deviations from it to within a tolerance of ±0.2dB.

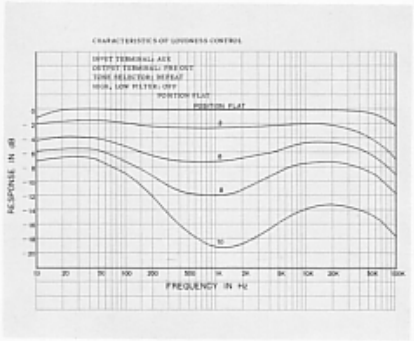


Continuous Loudness Control

The value of this feature lies in the way we hear sound. What it does is to compensate for the inability of the human ear to perceive low-level bass and treble signals according to the actual sound vol-

ume sensed by the ear. It is an exclusive feature with Yamaha receivers and amplifiers. In designing it, Yamaha has taken into consideration the efficiency of your speakers, the acoustics of your listening room and many other factors so as best to provide continual adjustment of the loudness contour. To use the control, you first set the loudness control to the FLAT position. Then set the volume control to the loudest volume you usually desire. Finally, you reduce the volume by turning the *loudness control* (NOT the volume control) whenever you wish to listen at a lower volume than that for which the volume control has been set. With the control operated in this way, your ears always sense the same balance of the lows, midranges and highs at all volume levels.





Bass & Treble Tone Controls With Selectable Turnover Frequencies

The tone control amplifier in the CA-800 is also unusual. Along with its 3-stage direct-coupled design, it features Yamaha's unique collector-to-emitter negative feedback to combine both the advantages of so called negative feedback type tone control and the usual capacitor-resistor type. Such circuitry is desirable for keeping distortion and noise minimal while maximizing the signal-to-noise ratio. Also because, with the tone controls set to DEFEAT, it keeps the frequency response curve free of bumps and dips. Another feature; The turnover frequency for the Bass and Treble controls is selectable—between 250Hz and 500Hz for the former, between 2.5kHz and 5kHz for the latter —giving you virtually perfect control over the final reproduced sound.

Two-Step High & Low Filters

This fine amplifier has more than just the conventional high/low filters. It is equipped with an advanced three-stage direct-coupled filter amplifier featuring low noise and low distortion. Moreover, the High and Low filters each offer a choice of two cut-off frequencies. With the Low filter, you choose between 20Hz and 70Hz, with a cut-off characteristic of 12dB/octave. (The 20Hz filter will be useful as a subsonic filter to eliminate howling and super-low-frequency vibration of your speakers often caused by warped records or external vibration.) The High filter lets you choose between 6kHz and 12kHz, with a cut-off characteristic of 6dB/octave.

Relay-Operated Speaker Protection Circuit

The built-in speaker protector circuit works automatically the moment a DC voltage of ±2V appears at the speaker terminals, no matter what abnormal condition may have caused this voltage. Your speakers are always protected against accidental damage as a relay operates to cut off the output circuit,and automatically returns to normal the instant the DC voltage disappears. The protector circuit also serves as a muting circuit, eliminating the undesirable "popping noise" that normally is generated as you turn the amplifier's power switch on or off.

All-Electronic Power Transistor Protection Circuit

The CA-800's all-electronic protection circuit—provided before the output stage —instantly protects the important and expensive silicon power transistors, whenever the load impedance at the speaker terminals decreases below 2 ohms, or should ever those terminals be accidentally short-circuited. This is a limiter-type circuit that regulates the input power momentarily, so that the output signal waveform itself will not be clipped even when the protection circuit has operated.

Outstanding Versatility

Two Microphone Jacks

Separable Preamplifier and Power Amplifier

The preamplifier and power amplifier of the CA-800 are instantly separated by a coupler switch. This will let you install special-purpose instruments between them or to use them independently with external pre- or power amplifiers.

Two Power Input Circuits, One With 30/50/100 Kilo-Ohm Input Impedance Switch

Two Tape Record/Playback Circuits For Dubbing

There are two tape record/playback circuits. You can record into either, or even copy a recorded tape from one to the other.

Connects Two Pairs Of Speaker Systems

—20dB Audio Muting Switch

Mode Switch

Gives you a choice of normal stereo, reverse stereo (if you've connected your speakers in reverse channel), L+R mono (for total sound in one-speaker reproduction), L-channel only mono, or R-channel only mono.

Four Convenient AC Outlets to Power Other Components in Your Stereo System

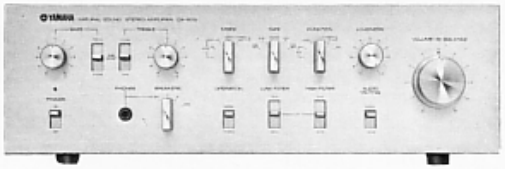
All Switches and Controls — Including Specially-Ordered Extra-Smooth Lever Switches — Have Smooth, Firm, Professional Feel, and Are Arranged for Ease Of Operation.

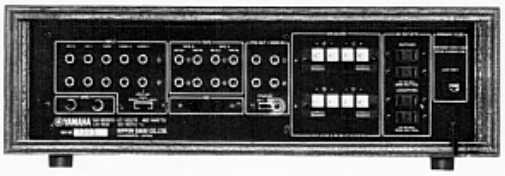
Headphone Jack

Two Aux, One Tuner Input Circuits

SPECIFICATIONS

AUDIO SECTION	CLASS-B	CLASS-A
POWER OUTPUT		
Dynamic Power (IHF)	150 watts (4Ω)	–
	130 watts (8Ω)	20 watts (8Ω)
Continuous RMS Power (each channel driven)	70/70 watts (4Ω) at 1,000Hz	–
	55/55 watts (8Ω) at 1,000Hz	10/10 watts (8Ω)
Continuous RMS Power (both channels driven)	60+60 watts (4Ω) at 1,000Hz	–
	50+50 watts (8Ω) at 1,000Hz	10+10 watts (8Ω)
Continuous RMS Power (both channels driven)		
	50+50 watts (4Ω) at 20 to 20,000Hz	–
	45+45 watts (8Ω) at 20 to 20,000Hz	10+10 watts (8Ω)
TOTAL HARMONIC DISTORTION		
Power Amplifier Only	less than 0.1% at rated power	less than 0.1% at rated power
	less than 0.04 at 1 watt	less than 0.02% at 1 watt
Preamplifier Only (PHONO to PRE OUT)	less than 0.1% at rated power	less than 0.1% at rated power
(AUX to PRE OUT)	less than 0.02% at rated power	less than 0.02% at rated power
Overall (AUX to Power Output)	less than 0.1% at rated power	less than 0.05% at rated power
INTERMODULATION DISTORTION (70Hz : 7,000Hz=4 : 1 SMPTE method)		
Power Amplifier Only	less than 0.1% (8Ω) at rated power	less than 0.1% (8Ω) at rated power
Power Amplifier Only	less than 0.05% (8Ω) at 1 watt	less than 0.05% (8Ω) at 1 watt
Overall (AUX to Power Output)	less than 0.1% (8Ω) at rated output	less than 0.1% (8Ω) at rated output
POWER BANDWIDTH (IHF, distortion 0.5% const.)	5 to 70,000Hz	5 to 100,000Hz
LOAD IMPEDANCE	4 to 16Ω	(4) to 8 to 16Ω
DAMPING FACTOR (8Ω)	70 at 1,000Hz	70 at 1,000Hz
FREQUENCY RESPONSE (at 1 watt)		
Overall (Tuner, AUX, TAPE PB to Power Output)	10 to 50,000Hz +0.5dB, −1dB	
Overall (MIC to Power Output)	20 to 20,000Hz +0.5dB, −2dB	
Power Amplifier Only	10 to 100,000Hz +0dB, −1dB	
Deviation from RIAA (30 to 15,000Hz)	+0.2dB, −0.2dB	
CHANNEL SEPARATION (at rated power, 1,000Hz)		
Power Amplifier Only	better than 60dB	
Overall from PHONO 1, 2	better than 50dB	
Overall from Tuner, AUX, TAPE PB	better than 50dB	
Overall from MIC	better than 50dB	
HUM AND NOISE (IHF, Closed circuit A Network)		
Overall from PHONO 1, 2	better than 80dB	
Overall from MIC	better than 70dB	
Overall from Tuner, AUX, TAPE PB	better than 90dB	
Power Amplifier Only	better than 100dB	
Volume at Minimum	better than 90dB	
INPUT SENSITIVITY AND IMPEDANCE (at rated power, 1,000Hz)		
PHONO 1	3mV (30kΩ, 50kΩ, 100kΩ)	
PHONO 2	3mV (50kΩ)	
PHONO 1, 2 Max. Input Capability	310mV (T.H.D. 0.1%)	
MIC	2.5mV (50kΩ)	
MIC Max. Input Capability	245mV (T.H.D. 0.1%)	
TUNER, AUX 1, 2	120mV (40kΩ)	
TAPE PB A, B	120mV (40kΩ)	
Power Amplifier Input	775mV (40kΩ), 345mV (CLASS A)	
OUTPUT LEVEL AND IMPEDANCE (at rated power, 1,000Hz)		
TAPE REC OUT A, B	120mV (2kΩ)	
PRE OUT	775mV (2kΩ)	
	3,000mV (Max. Output T.H.D. 0.1%)	
TONE CONTROLS		
BASS	+15dB, −15dB, at 50Hz	
TREBLE	+10dB, −10dB at 10,000Hz	
FILTERS		
LOW	−3dB at 20Hz, 70Hz (12dB/oct.)	
HIGH	−3dB at 6,000Hz, 12,000Hz (6dB/oct.)	
LOUDNESS CONTROL (Continuous Loudness Volume at Minimum)	+10dB at 100Hz, +5dB at 10,000Hz	





GENERAL	
Semiconductors	2 FETs; 49 Transistors; 12 Diodes; 4 Zener Diodes
Power Source	AC117V, 50/60Hz
Power Consumption	
Max.	300 watts
Rated	190 watts
AC Outlets	
Switched	2 (total 200 watts)
Unswitched	2 (total 200 watts)
Dimensions	436mm (17¼")W×144mm (5¾")H×323mm (12¾")D
Weight	13.5kg (29.7 lbs)

Specifications subject to change without notice.

For details please contact:

SINCE 1887 YAMAHA

NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN

A-55C 74930 3 Printed in Japan

CA-810

CIRCUIT DIAGRAM